Offshore Wind Power Limited

West of Orkney Windfarm

Onshore HRA: Report to Inform Appropriate Assessment

WO1-WOW-CON-EV-RP-0123: Approved by S.Kerr
Document Control 25/10/2023

ASSIGNMENT L100632-S09

DOCUMENT L-100632-S09-A-REPT-004

XODUS

West of Orkney Windfarm

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REV	DATE	DESCRIPTION	ISSUED	CHECKED	APPROVED	CLIENT
A01	18/10/2023	Issued for Use	Xodus / MacArthur Green / Caledonian Conservation / Trex Ecology	AF	NB	OWPL
R01	28/08/2023	Issued for Review	Xodus / MacArthur Green / Caledonian Conservation / Trex Ecology	AF	LS	OWPL

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1 INTRODUCTION

1.1 Background

The Applicant, Offshore Wind Power Limited (OWPL), is proposing the development of the West of Orkney Windfarm ('the Project'), an Offshore Windfarm (OWF), located approximately 23 kilometres (km) from the north coast of Scotland and 28 km from the west coast of Hoy, Orkney.

Crown Estate Scotland (CES) awarded OWPL an Option Agreement Area (OAA) within the "N1" Plan Option (PO) to the west of Orkney in January 2022 for the development of the proposed Project following the ScotWind leasing round. The ScotWind leasing round was launched in June 2020 and resulted in 17 developments being awarded OAA's in January 2022. A further three developments were awarded OAAs in April 2022 as part of the ScotWind clearing process. Considering the additional clearing process, the ScotWind leasing round brings a new potential energy supply of 27.6 Gigawatt (GW) from the 20 developments.

The Scottish Government published the Sectoral Marine Plan for Offshore Wind Energy in October 2020 following over two years of extensive analysis, consideration and engagement with a wide range of stakeholders.

1.2 Project overview

The Project has a grid connection agreement with National Grid for a connection to the grid network in Caithness on mainland Scotland, at or near Spittal. OWPL are responsible for the consenting of the OWF and transmission infrastructure, with the exception of the construction and operation of the grid infrastructure, for which Scottish Hydro Electric Transmission plc (SHET-L) will be responsible.

OWPL are submitting separate applications for the offshore Project (the offshore components (seaward of Mean High Water Springs (MHWS)) and for the onshore Project (the onshore components (landward of Mean Low Water Springs (MLWS)) in order to consent the OWF and export of power to Caithness. To this end:

- OWPL are seeking Planning Permission in Principle (PPP) for the onshore Project under the Town and Country Planning (Scotland) Act 1997 (as amended), the Application for which has been submitted to The Highland Council (THC) alongside this Report to Inform Appropriate Assessment (RIAA) for approval; and
- OWPL are also seeking a separate Section 36 Consent for the offshore Project, as required under the Electricity Act 1989, a declaration under Section 36A of the Electricity Act 1989 to extinguish public rights of navigation so far as they pass through those places within the Scottish Marine Area where the Wind Turbine Generators (WTGs) will be located, and Marine Licences, as required under the Marine (Scotland) Act 2010 and the Marine and Coastal Access Act 2009. The Section 36 Consent and Marine Licence applications were submitted to the Marine Directorate for determination in September 2023.

The location of the onshore Project's Red Line Boundary (RLB), known throughout this onshore RIAA as the 'onshore Project area', within which the landfall options, onshore export cable corridors and onshore substation are to be located, is shown in Figure 1-1.

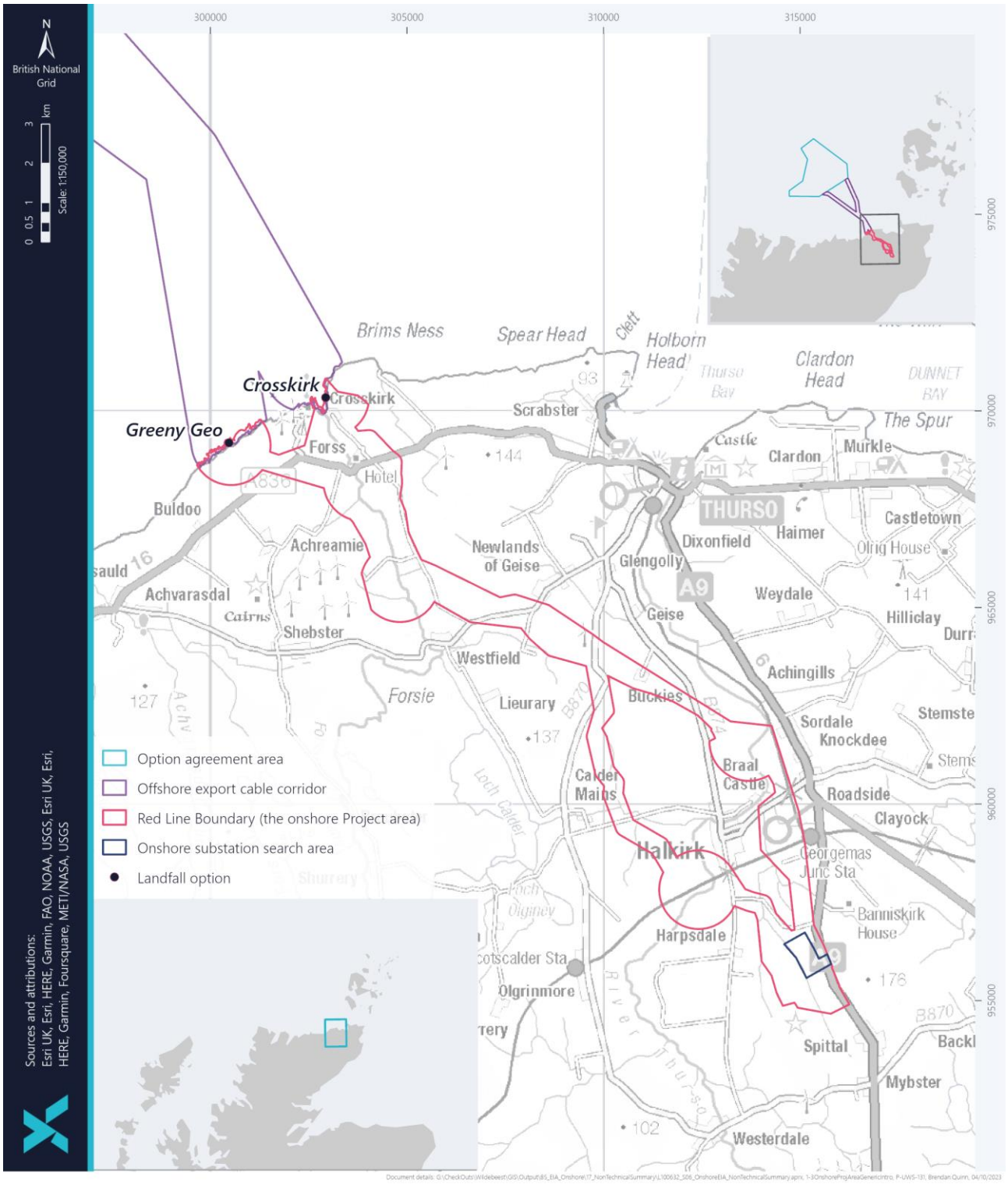

Figure 1-1 Onshore Red Line Boundary overview

OWPL also has an exclusive partnership for the Project to power the Flotta Hydrogen Hub (Flotta, Orkney) through a Power Purchase Agreement (PPA). However, this Onshore Habitats Regulations Appraisal (HRA) RIAA, only considers the connection to Spittal, Caithness. A separate future planning application for the onshore transmission infrastructure associated with the connection of the Project to the proposed Flotta Hydrogen Hub will be submitted at a later date and will be the subject of a separate HRA RIAA.

This onshore RIAA has been prepared to support the Application for PPP for the onshore Project. The key onshore components (landward of MLWS) of the onshore Project will include:

- Offshore export cables – up to five export cables that transmit power between the offshore Project to Transition Joint Bays (TJBs) (one TJB per cable) at the landfall site. The cables will be installed using Horizontal Directional Drilling (HDD) (as opposed to Open Cut Trenching (OCT) across the shore);
- Landfall – two options are proposed, one at Crosskirk and one at Greeny Geo. If either option is constrained, the TJBs may be split over the two landfalls (e.g., three TJBs at Crosskirk and two TJBs at Greeny Geo);
- Onshore export cables – up to five onshore export cable circuits[1] laid in separate trenches, with each comprising three single core power cables and one communication cable, which transmit power at High Voltage Alternating Current (HVAC), underground between the TJBs and the onshore substation;
- Onshore substation (420 kV) – required to transform the power to comply with the requirements of SHET-L Spittal 2 substation and the National Grid network;
- Temporary construction compounds and working corridors for the landfall, onshore export cables and onshore substation;
- Temporary access tracks for the landfall and along the onshore export cable route; and
- Seven permanent access tracks (indicative at this stage) across the onshore Project area.

An overview schematic of the Project as a whole, including both the main components of the onshore Project and offshore Project (as further summarised in section 5.13) is shown below in Figure 1-2.

The key Project milestones are

- Commencement of onshore construction – 2027;
- Commencement of offshore construction – 2028; and
- First power, earliest date is 2029.

[1] The onshore export cables will be laid in circuits (up to five circuits buried in five separate trenches) with each comprising a series of grouped cables as described. For ease of the reader, only the term 'onshore export cables' is retained throughout the RIAA topic specific assessments.

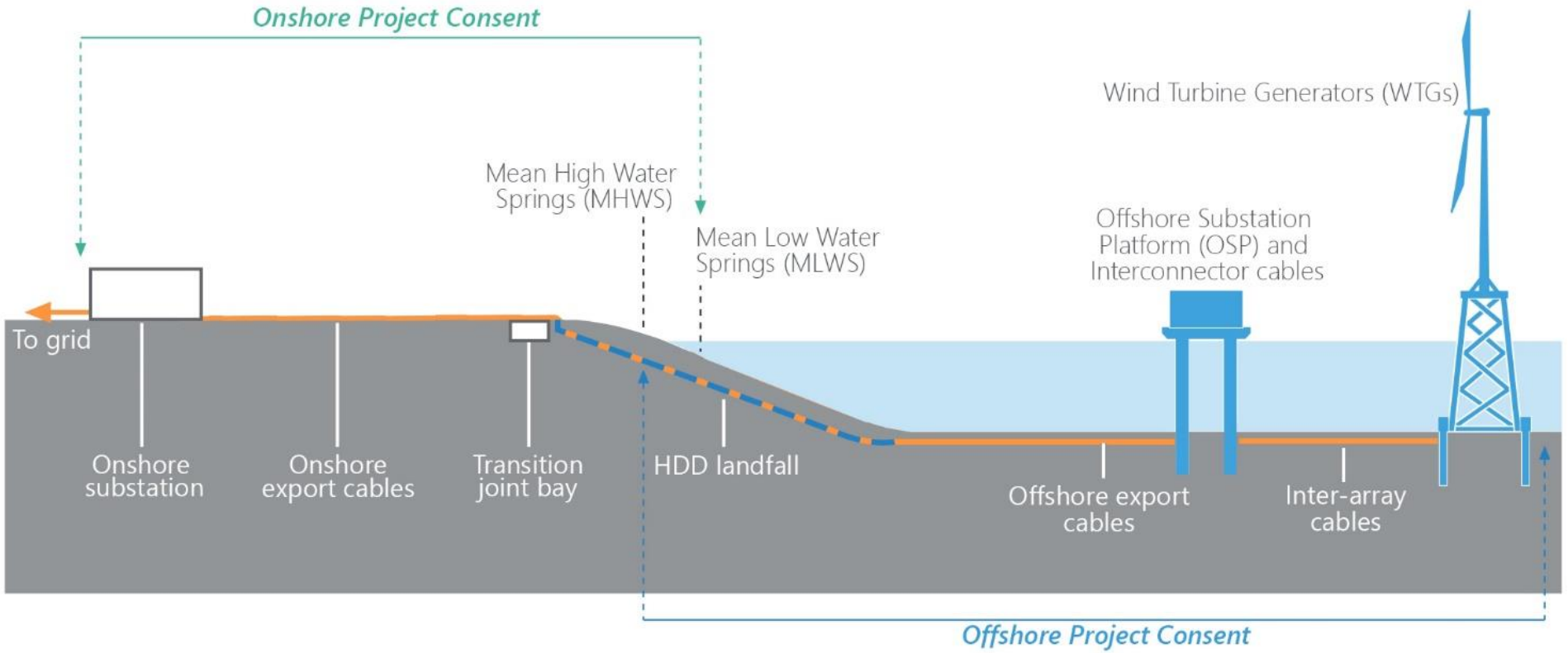

Figure 1-2 Overview of the main components of the Project

1.3 Report overview

The need for this onshore RIAA was identified through the Stage One HRA Screening. The Onshore HRA Screening Report (OWPL, 2023a) was submitted to THC in April 2023, and outlined the details of the onshore Project and provided an assessment of whether, in view of best scientific knowledge, there is potential for the onshore Project, individually or in combination with another plan or project, to have a Likely Significant Effect (LSE) on a European site[2] (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. The HRA Screening Response (THC, 2023) was received from THC in June 2023 (details of the response received are provided in section 5 of this report).

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

As the Project is submitting separate applications for onshore and offshore to different regulatory bodies, the offshore infrastructure of the Project has been considered separately in the Offshore RIAA (OWPL, 2023b). Any European sites with marine components where there is potential connectivity to the onshore Project have been considered in this Onshore RIAA, and where any onshore European site has potential connectivity with the offshore infrastructure of the Project, this was considered in the Offshore RIAA associated with the offshore Section 36 Consent and Marine Licence applications.

The assessment within this RIAA is based on the existing understanding of the baseline environment and the onshore Project activities. This report has been developed alongside the Onshore Environmental Impact Assessment (EIA) Report for the onshore Project (OWPL, 2023c), which provides further detail on the onshore Project, stakeholder consultation and other technical supporting information. Where applicable, information from the Onshore EIA Report has been incorporated into the assessment presented in this RIAA and referenced accordingly. However, for the avoidance of doubt, this RIAA is considered as separate and distinct from the Onshore EIA process.

The following specialists have undertaken the assessments presented within this document:

- Caledonian Conservation Ltd: Assessment of adverse effects on site integrity of the Caithness and Peatlands SAC / Ramsar (see section 6.6);
- Trex Ecology Ltd: Assessment of adverse effects on site integrity of the River Thurso SAC (see section 6.7); and
- MacArthur Green Ltd: Assessment of adverse effects on site integrity of the North Caithness Cliffs SPA, Caithness Lochs SPA and Ramsar site, and Caithness and Sutherland Peatlands SPA and Ramsar site (see section 7.6 to 7.8).

[2] *Although the UK has left the European Union (EU), the term European site has been retained throughout this document as discussed in section 3.1.*

1.4 Report structure

The structure of this document is summarised below:

- Section 1: Introduction. Provides the background of the onshore Project;
- Section 2: Project description. Outlines the onshore Project design parameters including the construction, operation and maintenance, and decommissioning stages, as well as 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 3: The HRA process. Provides the legislative context driving the need for the RIAA, and summarises the process;
- Section 4: Summary of the HRA Screening process. Summarises the screening process (Stage One) and identifies relevant European sites to be considered within the HRA assessment;
- Section 5: HRA consultation. Summarises the consultation of relevance to the HRA that has taken place to date, with whom the consultation was undertaken and the date the consultation was conducted;
- Section 6: European sites designated for Annex II features. Provides an assessment of potential effects on SACs (and Ramsar sites) with Annex II qualifying interests;
- Section 7– European sites designated for ornithology features. Provides an assessment of potential effects on SPAs (and Ramsar sites) with ornithology qualifying interests;
- Section 8 – Summary of mitigation and monitoring. Summarises the need for secondary mitigation and monitoring in relation to the receptors assessed.
- Section 9: Conclusions of the RIAA. Summarises the conclusions of the potential adverse effects of the onshore Project on qualifying interests, either alone or in-combination and provides an outline of the proposed biodiversity enhancement plans for the onshore Project;
- Section 10: References;
- Section 11: Abbreviations; and
- Section 12: Glossary.

2 PROJECT DESCRIPTION

A full description of the onshore Project is provided in Onshore EIA Report; chapter 5: Project description. The following information within this section provides a summary of the key project design parameters for the onshore Project infrastructure that are relevant to the assessment provided in this RIAA.

This onshore RIAA has been developed in accordance with best practice, including the recent Scottish Government (2022) guidance for applicants on using the design envelope approach for applications under section 36 of the Electricity Act 1989, which although aimed principally at the offshore aspects of the Project, is considered to be also relevant to this Application for PPP under the Town and Country Planning (Scotland) Act 1997 (as amended). As such, the Project has utilised a design envelope approach to inform this RIAA. A design envelope approach allows a range of parameter values to be presented for each Project aspect. This ensures that flexibility is retained in the design so that the final Project can be accommodated within the onshore Project consent.

The PDE parameter values which represent the worst case scenario for the assessments presented within this RIAA have been determined on a case-by-case basis, depending on the receptor and impact being considered. 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.

2.1 Onshore Project area

The onshore Project area, within which the onshore Project infrastructure will be located, is presented in Figure 1-1. The onshore Project area includes:

- Landfall (up to MHWS) at Greeny Geo and/or Crosskirk- where the offshore export cables come ashore and interface with the onshore Project;
- The onshore export cable corridor from the landfall locations to the onshore substation located at Spittal, Caithness; and
- The onshore substation at Spittal, required to transform the power to comply with the requirements of the SHET-L Spittal 2 substation and the National Grid network.

The onshore Project area has been split into three distinct Development Zones, comprising the landfall, onshore export cable and onshore substation, as per Figure 2-1 below.

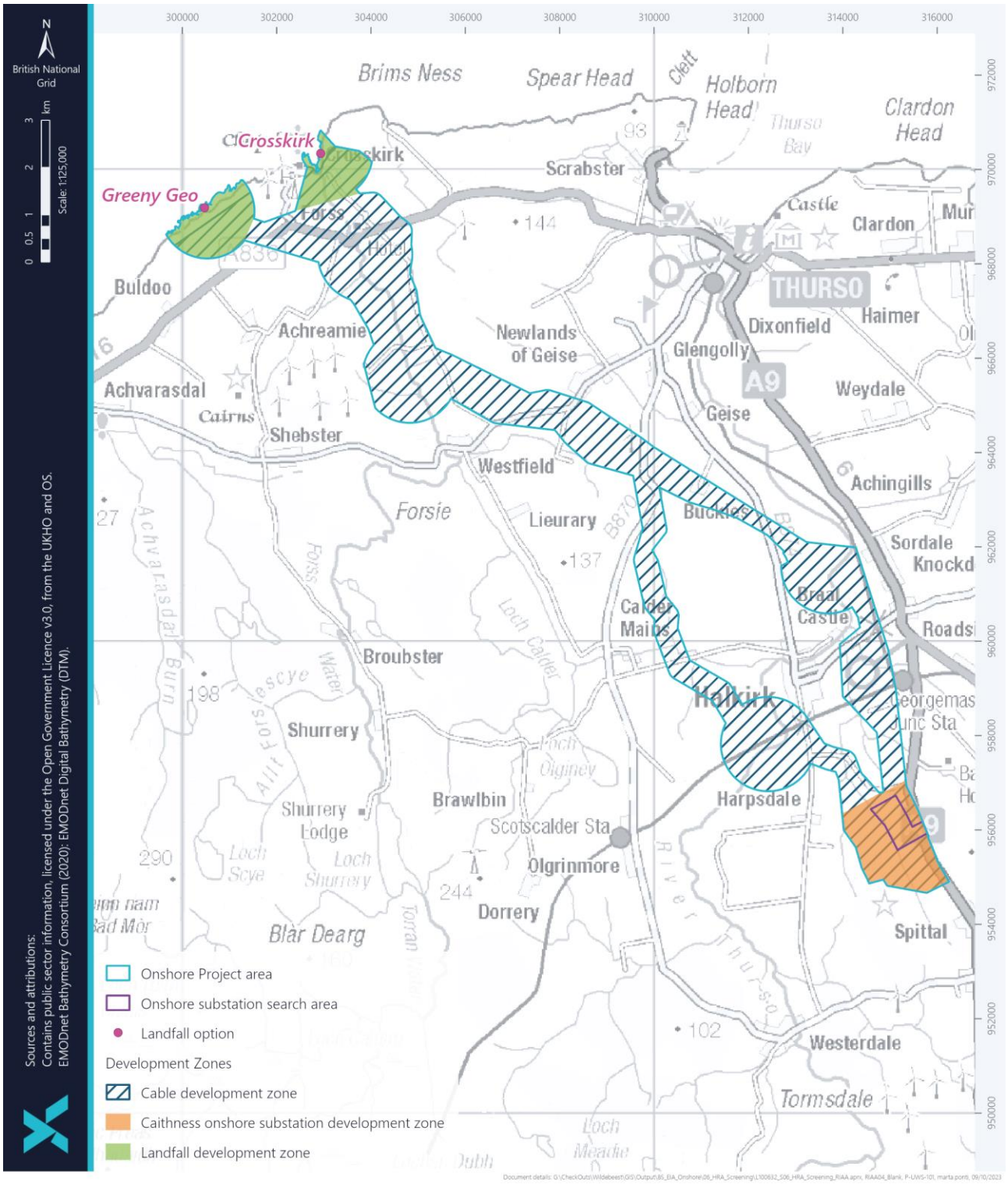

Figure 2-1 Development Zones for onshore Planning PPP Application

2.2 Onshore infrastructure

The key onshore Project design parameters are outlined in Table 2-1.

Table 2-1 Key onshore Project parameters

AREA	PROJECT ASPECT	DESCRIPTION
Landfall	Landfall location(s)	• Crosskirk and/or Greeny Geo
	Offshore export cables	• Up to five offshore export cables that transmit power between the offshore Project to TJBs (one TJB per cable) at the landfall site. The offshore export cables will bypass MLWS to the landfall options via HDD. As such, there will be no surface laid infrastructure between the MLWS and the landfall location(s).
	Installation	• The installation of offshore export cables at landfalls will be achieved through HDD. Preparation of the working area at the landfall site to accommodate up to six HDD boreholes (5 plus 1 contingency). • The HDD drilling rig equipment, utilities and welfare facilities requires a temporary HDD compound of up to 7,500 m^2. • Excavated materials from the boreholes estimated to be 1,630 m^3 per HDD bore which will be disposed off-site.
	TJBs	• Up to five TJBs (one per cable). The TJBs will range between 6 m long x 3 m wide x 3 m deep to 30 m long x 6 m wide x 5 m deep.
Onshore Export Cable Corridor	Onshore export cables	• Up to five underground onshore export circuits[1] laid in separate trenches, with each cable comprising three single core power cables and one communication cable, which transmit power as HVAC, between the TJBs and the onshore substation. • Depth of the trenches will be at least 1 m to 1.8 m on agricultural land, with additional depth required for crossings (e.g., roads and watercourses); the installed width will be 2 m at the bottom of the trench, widening to a maximum of 8 m at the top of the trench, depending on installation technique applied. • The onshore underground export cable route from landfall will be a maximum of 33 km (no overhead lines are proposed). • Reinstatement of all areas will be undertaken following construction. Fencing of these areas will be undertaken to prevent any livestock from damaging newly reinstated areas.

AREA	PROJECT ASPECT	DESCRIPTION
	Voltage of cables	• Up to 420 kilovolts (kV).
	Installation	• OCT over unobstructed ground. • Dry OCT will be the main methodology for minor watercourse or ditch crossings. However, trenchless technologies, such as cased auger boring, thrust boring or pipe jacking, may be required depending on ground conditions for minor roads and existing utilities or non-sensitive watercourse crossings. • HDD will be utilised for major crossings such as the main rivers (e.g., the River Thurso) or railways. The maximum working area that is required is expected to be 100 m x 30 m at each HDD site. • Excavation rate for OCT is approximately 50-60 m per day and for HDD crossings is < 10 m per day. • Construction compounds required of up to 150 x 150 m (22,500 m^2).
	Cable Joint Bays (CJBs)	• A total of 288 CJBs for all five onshore export cable cables has been assumed to allow for contingency. • Each CJB will be 30 m long x 3 m wide x 2.5 m deep.
	Working corridor	• Up to 100 m width which includes an area for cable trenches, haul roads, areas of stripped soil (for the use of laydown of construction plant and other activities), cable safety zones, and an allowance of tapering of the trenches. • Temporary laydown compounds (100 m x 100 m) will be required approximately every 2 km along the onshore export cable route, resulting in a total footprint of up to 130,000 m^2.
Onshore Substation Search Area	Onshore substation	• Maximum of 12 buildings / areas which includes switchgear rooms, control buildings, storage and maintenance buildings. The control building includes relay plant, metering plant, batteries and telecommunication equipment. • The full size of the development area of the onshore substation (including substation screening and bunding) is 239,200 m^2 (23.9 hectares (ha)). • The Air Insulated Substation (AIS) design consists of busbars and up to five Super Grid Transformers (SGTs) operating at 400 kV[3] is assumed to represent the worst case spatial scenario from an EIA perspective. In addition to the SGTs, there is the following associated infrastructure:

[3] *400 kV is the nominal operating voltage for the connection to the Grid substation.*

AREA	PROJECT ASPECT	DESCRIPTION
		– Five shunt reactors used to stabilise the voltage throughout load differences in the high voltage power transmission system; – Five static synchronous compensator (STATCOM[4]) transformers designed to be shunt-connected with the grid to compensate for reactive power; and – Five harmonic filters used to mitigate and reduce harmonics to acceptable ranges in the power transmission system. • The rating of equipment is subject to detailed electrical studies. • The maximum noise level at the onshore substation is 100 decibels (dB(A)) noise level 1 m from the main transformer. • Internal access roads will be included within the footprint of the onshore substation. • External lighting for the onshore substation will range from 2.2 lux to 150 lux in order to illuminate the building and external area. • 2.5 lux will be required around the perimeter fencing. There may also be a need for up to 150 lux at areas requiring higher illumination. • Passive infrared (PIR) sensor lighting will be used or similar, however consideration will be given to permanent lighting of certain areas. All lighting will be designed to minimise light pollution with use of flat glass luminaires asymmetrical optics. • The maximum excavated material from the onshore substation is 1,207,000 m^3.
	Onshore substation construction compound	• The maximum footprint of the onshore substation construction compound and welfare facilities (site office and temporary car park) is up to 62,500 m^2.
Access	Temporary access	• Temporary access tracks (not including haul roads) up to 3,300 m in length at the landfall, the entry and exit points of the HDD points and the onshore substation. Lengths are indicative only.
	Permanent access	• It is anticipated that up to seven new permanent access tracks will be required for HDD sites and one permanent access track will be required at the onshore substation. This consists of approximately 5 km of permanent access tracks. 24% (1.2 km) are existing tracks, 44% (2.21 km) are existing tracks that require improvements and 32% (1.67 km) will be newly installed tracks.

[4] STATCOM continuously provides variable reactive power in response to voltage variations, supporting the stability of the grid.

2.3 Project stages

2.3.1 Pre-construction and Construction

A detailed construction programme will be developed as design and procurement activities progress and full details including sequencing and installation methodologies will be confirmed in the Construction Method Statement (CMS) which will be produced and agreed post-consent.

It is anticipated that the construction of the onshore Project will take approximately four years (subject to change) followed by a final pull through of the offshore cables. The onshore works will involve three main working areas:

- The landfall HDDs;
- The cable route from the landfalls to the substation; and
- The substation including interconnection to the SHET-L Point of Connection.

The indicative construction programme is presented in Figure 2-2.

The timing of the construction programme is indicative and depends on a number of factors, including but not limited to:

- The date that a Contract for Difference (CfD) is awarded (dependent on the Project gaining necessary consents);
- Contractor availability;
- Weather conditions; and
- Other supply chain or logistical issues.

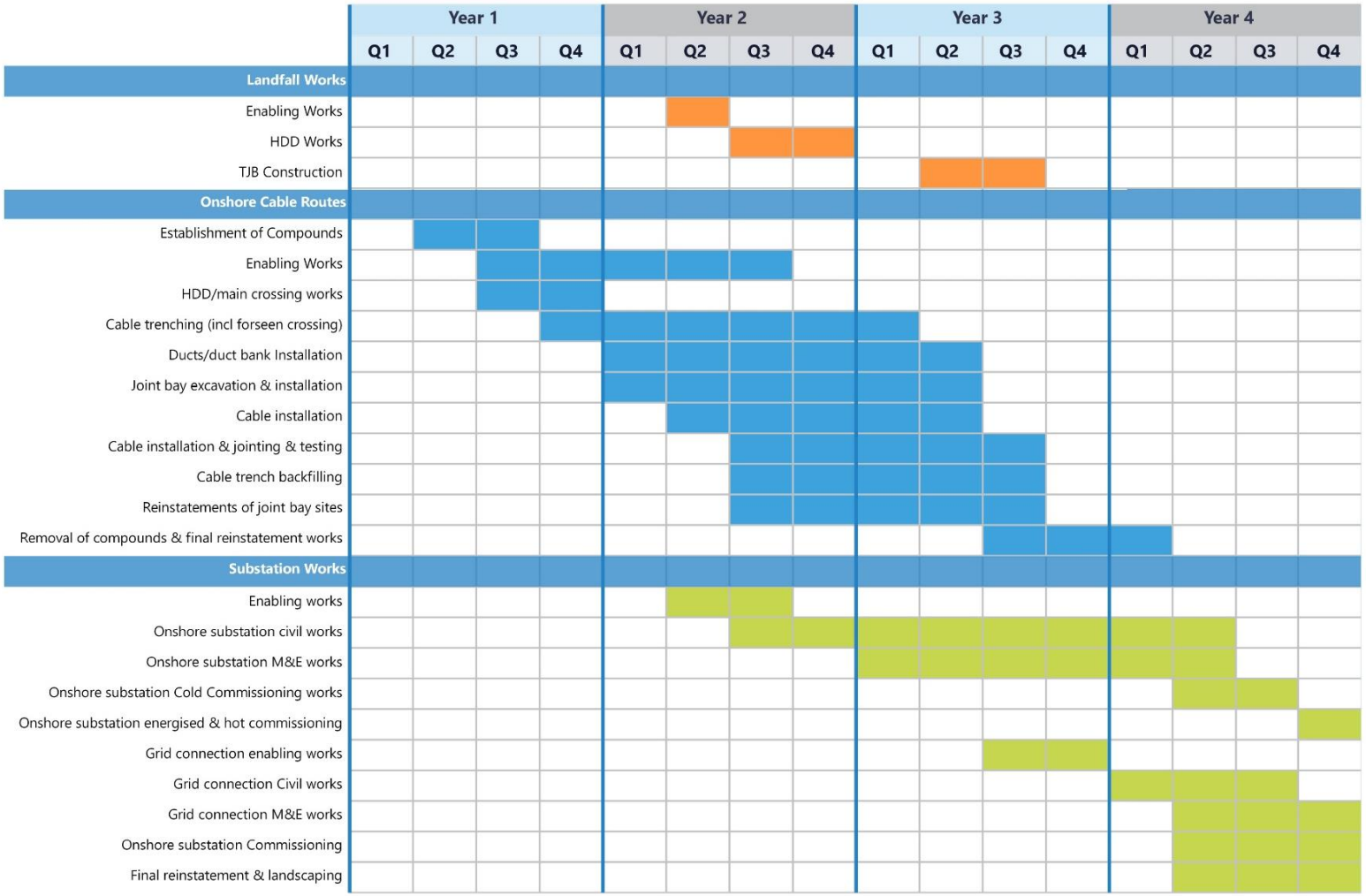

Figure 2-2 Indicative construction programme

2.3.1.1 Pre-construction surveys and site investigation

Several activities are required ahead of construction, including pre-construction surveys, site investigations and site preparation. These surveys may include intrusive archaeological investigations, pre-construction ecology surveys, hydrology surveys, geotechnical and ground stability surveys. The requirement for these surveys will be determined following the engineering design phase and enforced through planning conditions.

2.3.1.2 Construction Environmental Management Plan (CEMP)

An outline CEMP has been prepared and submitted as part of this PPP Application to THC (see OMP1: Outline CEMP). The CEMP will be finalised and submitted to THC prior to the construction of the onshore Project, once detailed design and procurement are complete.

The CEMP will detail the procedures which will be adhered to in order to ensure all activities with potential to adversely affect the environment are appropriately managed. The CEMP will incorporate CMS and working procedures relating to mitigation as agreed with OWPL and statutory consultees as part of the planning consent conditions. The CEMP will be included as part of the overall site management and operational procedures and all staff will receive appropriate training on its contents. Once finalised and approved, the CEMP will be a live document and if necessary, will be periodically revised to take account of emerging best practice and standard procedures.

As per OMP1: Outline CEMP, a number of management plans to be implemented during construction will be finalised and either be appended to the final CEMP or included as standalone documents submitted separately from the CEMP, in accordance with anticipated PPP conditions. The contractor's compliance with these management plans and environmental procedures including measures for pollution prevention and monitoring of performance will be implemented by the contractor and monitored by OWPL.

2.3.1.3 Construction working hours

Core working hours for the construction of the onshore elements of the Project will be typical working hours which are taken to be 8 am to 7 pm Monday to Friday and 8 am to 1 pm on Saturdays. This will also apply to Heavy Goods Vehicle (HGV) movements. In certain circumstances, specific works may have to be undertaken outside the normal working hours (such as HDD operations). In these instances, working hours will be agreed in advance with THC's Environmental Health Department.

2.3.1.4 Construction traffic

Construction of the onshore Project will generate traffic on the local road network. This is likely to include HGVs delivering plant and equipment, as well as Light Good Vehicles (LGVs) and cars associated with construction staff movements. The construction plant likely to be used for the onshore export cable route includes tracked or wheeled hydraulic excavators and tracked trencher and for the onshore substation includes excavators, piling rigs (if required) and cranes. Indicative traffic numbers and plant requirements are discussed within chapter 16: Access, traffic and transport of the Onshore EIA Report.

The most intensive traffic is expected to occur between Year 2 Q2 and Year 3 Q2, with the maximum predicted in Q3 of the Year 2 of construction with an average of 632 construction HGV vehicle trips per day, or an average maximum of 53 two-way HGV vehicle movements each hour, based on a 12-hour working day.

An outline Construction Traffic Management Plan (CTMP) has been prepared and submitted as part of the PPP Application to THC (see OMP2: Outline CTMP). The CTMP includes details of access routes, delivery timings, car parking arrangements, temporary signage, amongst others. The CTMP will be finalised and submitted to THC prior to the construction of the onshore Project, once detailed design and procurement are complete.

Additionally, an Abnormal Loads Assessment (ALA) is provided alongside the PPP Application to THC, in SS15: Abnormal Loads Assessment, which takes into consideration the roads that may be used to deliver any abnormal or special loads and any works necessary to accommodate them.

2.3.1.5 Construction waste

The Principal Contractor will make arrangements for the safe and legal disposal of waste during the construction, installation, operation and maintenance, and decommissioning of the onshore Project.

Temporary site office and welfare areas will be provided during construction with closed skips for the segregation and disposal of paper, cardboard and mixed municipal waste. All waste containers will be stored away from drainage runs and kept clean and closed to prevent odour, wind-blown litter and to avoid attracting vermin. Effluent from temporary portable toilets will be collected by the toilet hire company with disposal to a sewage treatment works.

Waste wood, metals and ceramics (cement) are to be segregated into skips for off-site recycling. Mixed construction and demolition waste will be collected for offsite disposal by a licenced waste contractor. Facilities for the disposal of hazardous solid waste will be provided for items such as oil filters, batteries, paint tins, resins sealants and adhesives. Liquid hazardous wastes such as hydraulic oils will be stored in a suitable tank or drum within a bunded area. Fly tipping will be prevented by effective security measures.

HDD is unlikely to give rise to significant amounts of waste as drilling mud is typically captured and reused during the process, however, any excess waste, such as drill cuttings, will be transported by lorry and disposed of by a licenced waste operator at a licenced facility. It is anticipated there will be six tipper loads of spoil removed per week from the landfall construction works spoil.

Wastewater will be disposed of via main facilities where available with temporary facilities utilised where necessary. The final strategy will be agreed upon with statutory consultees and detailed within Waste Management Plan(s) appended to the final CEMP. As described above, an outline CEMP has been submitted alongside the Application for PPP (see OMP1: Outline CEMP).

2.3.1.6 Drainage strategy

A review of Scottish Environment Protection Agency (SEPA) Flood Maps (SEPA, 2021a) indicates that the majority of the onshore substation search area is not at risk from fluvial flooding. Nonetheless, the Burn of Achanarras is located immediately adjacent to the western edge of the onshore substation search area and this is shown to have a high

likelihood of fluvial flooding based on SEPA Flood Maps (i.e., each year this area has a 10% chance of flooding). However, the indicative location for the onshore substation is outwith this high-risk flood area.

Sustainable Urban Drainage Systems (SuDs) will be required for the onshore substation for all surface water drainage. The surface water drainage network for the onshore substation will be designed taking into account THC's Supplementary Guidance: Flood Risk and Drainage Impact Assessment (THC, 2013), SuDS Working Party (SUDWP) Water Assessment and Drainage Assessment Guide (SUDSWP, 2016) and Construction Industry Research and Information Association (CIRIA) Publication C753 – the SuDS Manual (CIRIA, 2015).

Proposed SuDS to be incorporated in the drainage strategy for the onshore Project include use of settlement ponds, swales, filter strips, check dams / berms, sumps and silt fences / straw bales at different stages of the onshore substation and onshore export cable installation. Different types and levels of treatment will be required for the various onshore Project components during construction, operation and maintenance and decommissioning. The features considered for the onshore Project are outlined in detail within an Outline Drainage Strategy submitted alongside the Application for PPP. The Outline Drainage Strategy is presented within SS3: Flood Risk and Drainage Assessment.

Any areas within the onshore substation where potentially polluting materials will be stored or used are likely to require additional treatment to ensure that spills and leaks do not gain direct access into the groundwater or surface water environments. Such additional treatment is likely to include oil separators, or provision of a self-contained drainage network which is entirely separate from the surface water drainage system. Treatment and discharge of surface water to the water environment is regulated under the Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended). This forms an additional requirement to planning conditions. Any formal authorisations under the Controlled Activities Regulations (CAR) that are needed for the drainage strategy will be put in place prior to construction works.

Drainage design is indicative at this stage, and the final detailed drainage design will be presented within a Drainage Strategy and Flood Risk Plan appended to the final CEMP. This plan will be consulted upon with THC and other stakeholders, as required, and will be completed at a future date following approval of the PPP and contractor appointment.

2.3.2 Operation and maintenance

Following commissioning, it is anticipated that the onshore substation will be unmanned and operate continuously (24 hours a day, 7 days a week) except during planned shutdowns for maintenance. The onshore export cables are also anticipated to be in operation continuously.

Over the lifespan of the onshore Project, it is anticipated that there will be 50% planned shutdown rate for the onshore export cables in years 5, 10, 15, 20 and 25. At the onshore substation, STATCOM scheduled refurbishments are scheduled in 9-year cycles with planned shutdowns in Year 9 and 18.

In addition, there will be routine maintenance activities at both the onshore substation and the onshore export cables and will include the following:

- Onshore substation - periodic planned inspections of all switchgear, buildings and ancillary equipment. This includes visual inspections, minor and major maintenance. In addition, monthly and annual BS 5266 Emergency Lighting Test and Emergency Warning and Intercommunication System (EWIS) and Automatic Fire Detection System Test will be carried out; and
- Onshore export cables - periodic visual inspection of the link boxes / TJBs and CJBs (typically bi-annually) including checking for faults, water penetration / ingress, corrosion of joints and cables and structural conditions.

Regular preventative visual checks will be carried out at the onshore substation, in addition to the periodic maintenance activities. Where possible, remote restart / reset of systems is to be utilised. There will be limited amounts of traffic to and from the onshore substation for general operation and maintenance purposes. The estimated traffic volume is around one vehicle per week. The duration of visits is dependent on manufacturer recommendations for the installed equipment and the final maintenance regime. Beside this, there will be no day-to-day personnel on site during normal operation.

Non-routine maintenance activities may be required due to events leading to unplanned defects or failures. These unexpected faults may lead to increased traffic volumes depending on the type of fault.

Relevant management plans for the operation and maintenance activities of the onshore Project will be developed post-consent and detail how operation and maintenance activities will be managed. These plans will be adhered to for the lifespan of the onshore Project.

2.3.3 Decommissioning

The preferred decommissioning option will be for as close to full removal as possible, whilst recognising that this will be subject to assessments and consultation closer to the time of decommissioning. This preference has been integral to the selection of design options and will continue to be through the detailed design phase.

A Decommissioning, Restoration and Aftercare Plan will be required as a planning condition to be approved by THC, prior to the onshore decommissioning works. Decommissioning and restoration best practice and legislation will be applied at that time. It is expected that decommissioning will follow a reverse order of the installation activities with some infrastructure potentially left *in situ*.

2.4 Embedded Mitigation

A number of embedded mitigation measures and management plans have been incorporated into the PDE 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 3.4, 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. Embedded mitigation measures relevant to the topic specific assessments are outlined in section 6.4 (Annex II species) and section 7.4 (ornithology).

3 THE HRA PROCESS

3.1 Legislative context

The requirement to consider the potential impacts of plans and projects on European sites falls under the following pieces of relevant legislation:

- 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)[5]; and
- The Wildlife and Countryside Act 1981.

The Habitats Regulations require consideration of whether projects or plans are likely to have a significant effect on a European site and its conservation objectives, including SACs, candidate SACs (cSACs), SPAs, potential SPAs (pSPAs), Sites of Community Importance (SCI) and Ramsar sites[5]. An HRA must be carried out to determine the potential for a development to result in a LSE on European sites, either individually or in-combination with other plans or projects. Sites of Special Scientific Interest (SSSIs) are not protected under the Habitats Regulations and do not form part of the HRA process.

The Habitat Regulations are in place to protect European sites. As the United Kingdom (UK) is no longer part of the EU, amendments were made to the Habitats Regulations in Scotland to ensure that they continue to work in the same manner. The amendments made are minor and technical in nature; for example, references to European Economic Area (EEA) states are corrected to exclude the UK, and the European sites located within the UK now form part of the UK's National Site Network and are no longer part of the Natura 2000 network. The policies and procedures under the HRA Regulations remain unchanged. These amendments were made through The Conservation (Natural Habitats, &c.) (EU Exit) (Scotland) (Amendment) Regulations 2019 and the Conservation of Habitats and Species Amendment (EU Exit) Regulations 2019 (the "EU Exit Regulations"). Guidance on the implications of EU Exit on the HRA Regulations is available through the Scottish Government website (Scottish Government, 2020a).

The Habitats Regulations contain the procedural requirements to undertake HRAs in order to assess the potential implications of plans / projects for European sites (Scottish Government, 2020b). The objectives in relation to the UK Site Network include:

- To maintain or restore habitats and species listed in the Habitats Directive to favourable conservation status; and
- To contribute to ensuring the survival and reproduction of certain species of wild birds in their area of distribution and to maintaining their populations at levels which correspond to ecological, scientific and cultural requirements, while taking account of economic and recreational requirements.

[5] It is Scottish Government policy to consider Ramsar sites as part of the HRA (Scottish Government, 2019). However, Ramsar sites are not considered separately if they overlap with SACs and/or SPAs

3.2 The HRA Process

The European Commission's (2021) guidance identifying a staged process for the assessment of plans or projects is relevant for this assessment, as illustrated in Figure 3-1. The four stages are commonly categorised as the following:

- Stage One: HRA 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 3.4;
- Stage Two: AA carried out by the Competent Authority and informed by the RIAA - 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 2.4);
- 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' (IROPI) - 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.

The Onshore HRA Screening Report (OWPL, 2023a) addressed Stage One of the HRA process (see section 4 for a summary of this report). This RIAA informs Stage Two of the HRA process by providing 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 Project.

The requirement for further stages of the HRA process will be determined by the outcomes of Stage Two undertaken by the Competent Authority and, as such, are not addressed within this document.

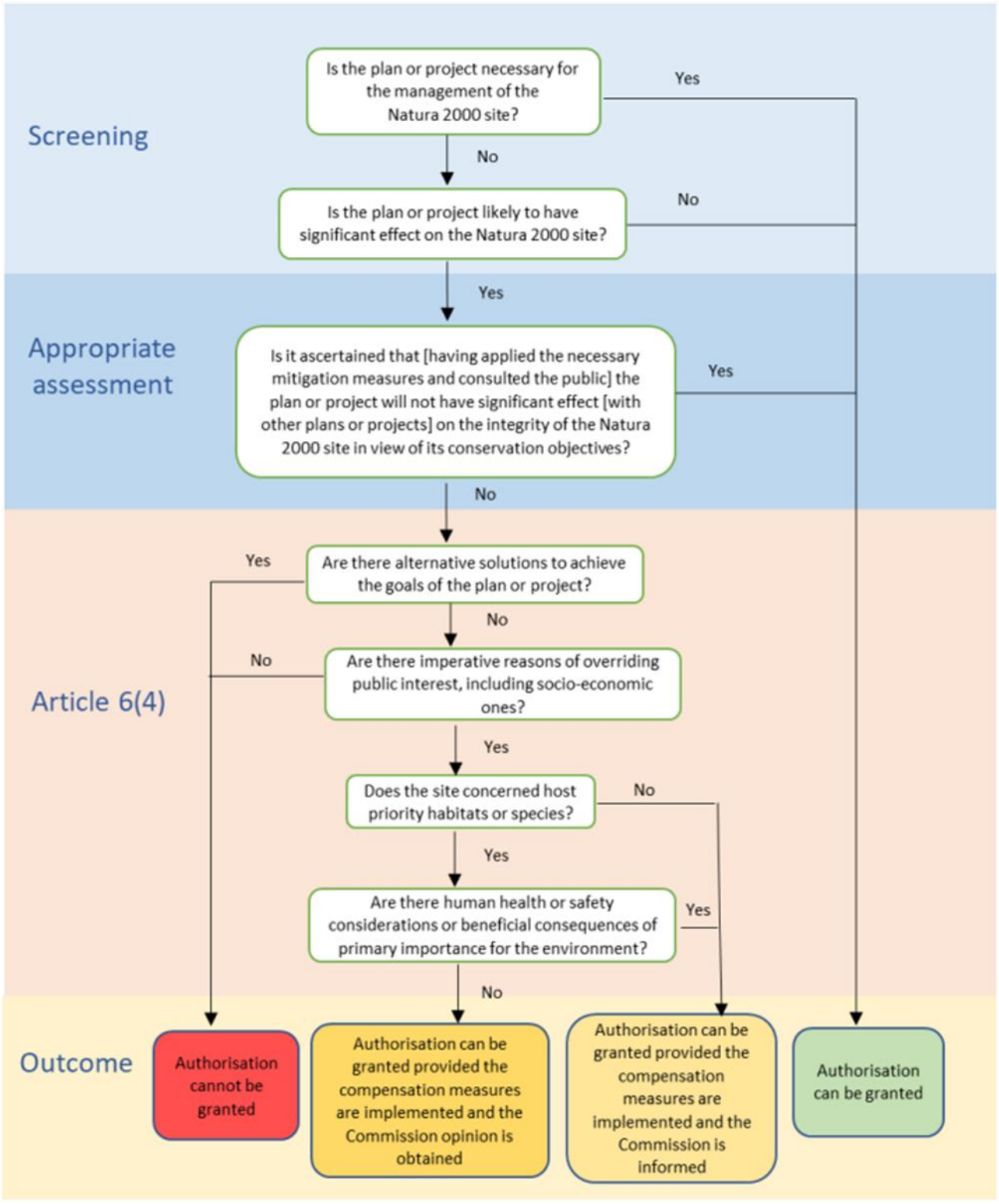

Figure 3-1 Staged HRA Process Summary (European Commission, 2021)

3.3 Guidance documents

There are a number of guidance documents and advice that is available to inform the HRA process. This RIAA has been informed by:

- Habitats Regulations Appraisal: Guidance for Plan-making Bodies in Scotland (Tyldesley *et al.*, 2015);
- The handling of mitigation in Habitats Regulations Appraisal – the People Over Wind CJEU judgement (SNH, n.d.);
- Scottish Government (2020b) Aligning Development Planning procedures with Habitats Regulations Appraisal requirements;
- Natura Casework Guidance: How to consider plans and projects affecting Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) (SNH, 2014);
- Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2021);
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission, 2019);
- EU Exit: habitats regulations in Scotland (Scottish Government, 2020a); and
- European Court of Justice Case C-323/17 People Over Wind and Peter Sweetman versus Coillte.

3.4 Key case law in relation to consideration of mitigation

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.

Following the judgement of the European Court of Justice in the People Over Wind and Peter Sweetman versus Coillte case in 2018 (Case C-323/17), NatureScot (then Scottish Natural Heritage (SNH)) provided guidance to clarify what stage mitigation can be considered in the HRA process for Scottish developments (SNH, n.d.). NatureScot (SNH, n.d) interpreted the judgement from the European Court of Justice as stating that mitigation measures that intend to avoid or reduce harmful effects to a European site cannot be considered at the screening stage. However, embedded mitigation measures which are not specifically designed to avoid or reduce effects on a European site, but do so incidentally, can be considered. Therefore, there must be a distinction between these two types of mitigation.

In response to this guidance, the Onshore HRA Screening Report (OWPL, 2023a) did not consider mitigation measures that are specifically implemented to reduce or avoid effects on a European site. Mitigation measures remain applicable for the determination of adverse effects, which is the focus of this RIAA.

4 SUMMARY OF THE HRA SCREENING PROCESS

4.1 Screening process

4.1.1 Overview

This section outlines the Stage One HRA Screening process which was used to inform the Onshore HRA Screening Report. The screening process followed a stepwise approach and was used consistently across the receptor specific topic assessments.

4.1.2 Identification of European sites and features with connectivity

European sites and features were identified with connectivity to the onshore Project. The identification of European sites was undertaken with reference to the qualifying interests / features in line with the following process:

- Identifying the range of effects that the onshore Project could have on qualifying feature(s) of a site (pathways for LSE); and
- Determining connectivity with the sites (e.g. if a qualifying interest / feature of the European site may overlap with the boundary of the onshore Project or the wider Zone of Influence (ZoI)).

Connectivity depends on a number of factors including life cycle, foraging, behavioural, breeding, and migratory characteristics of these qualifying features associated with a particular site and the characteristics and potential effects of the Project. Each particular receptor topic defined the relevant criteria used to determine connectivity, as detailed in Table 4-1. The outcome of this step was a list of European sites and features for which there is connectivity with the onshore Project.

The European sites within proximity to the onshore Project area, and which were considered within the Onshore HRA Screening Report (OWPL, 2023a), are shown below in Figure 4-1, Figure 4-2 and Figure 4-3.

Table 4-1 Initial screening criteria used within the Onshore HRA Screening Report

TOPIC	SCREENING CRITERIA
European sites Designated for Annex I Habitats	• There is direct spatial overlap between the onshore Project area and a European site or Ramsar Site designated for Annex I habitats; or • There is spatial overlap between the secondary effect footprint of the onshore Project area (e.g., within the ZoI for indirect effects such as hydrological connectivity, dust pollution, silt etc.) and European sites or Ramsar sites. The ZoI for pathways for secondary effects was considered to be 2.5 km from the boundaries of the onshore Project area, owing to the non-mobile nature of the receptors considered. As per Figure 4-1, no European sites designated for Annex I habitats were found to meet with this criterion and as such no European site for these features was screened into the assessment.

TOPIC	SCREENING CRITERIA
European sites Designated for Annex II Species	• European sites or Ramsar sites hosting a mobile population of qualifying interests (i.e., Annex II Species) or supporting a habitat for the qualifying feature that may directly interact with the onshore Project e.g., there is direct overlap with a European site and a qualifying interest; and • European sites or Ramsar sites hosting a mobile population of qualifying interests (i.e., Annex II Species) or supporting a habitat for the qualifying feature that may directly interact with the secondary effect footprint, or ZoI, of the onshore Project. For Annex II fish species the ZoI was considered to be any European site which is within the catchment area of the River Thurso or the River Forss as these two rivers have connectivity to the onshore Project area. Therefore, the River Thurso SAC has been considered within the assessment. For other Annex II species, a ZoI of 2.5 km was considered from the onshore Project area for non-mobile plant species owing to there being no potential pathway for connectivity to these receptors from direct or in-direct effects. As per Figure 4-2, no European sites for non-mobile plant species were found to meet this criterion and as such no European site for these features were screened into the assessment. For mobile terrestrial species, the ZoI from the onshore Project was considered on a receptor specific basis, taking into account best practice guidance and evidence, for example, particular foraging ranges of the qualifying interests identified. As such, the Caithness and Sutherland Peatlands SAC / Ramsar site were screened into the assessment due to otter foraging ranges.
European sites Designated for Ornithological Features	• European sites designated for ornithological features that overlap with the onshore Project; or • Where the distance between a European site and the onshore Project is within the range for which there could be an interaction with ornithological features (i.e., within a ZoI, resulting from the construction, operation and maintenance or decommissioning stages of the onshore Project). NatureScot (SNH, 2016) guidance was used to assess connectivity between the onshore Project and SPA / Ramsar sites based on the dispersal and foraging distances of qualifying features. A precautionary ZoI buffer of 20 km from the onshore Project area was used in order to screen in potential effects. This buffer represents the maximum core foraging range of any terrestrial bird species that is potentially present in the vicinity of the onshore Project area. Figure 4-3 illustrates SPA / Ramsar sites within the 20 km buffer.

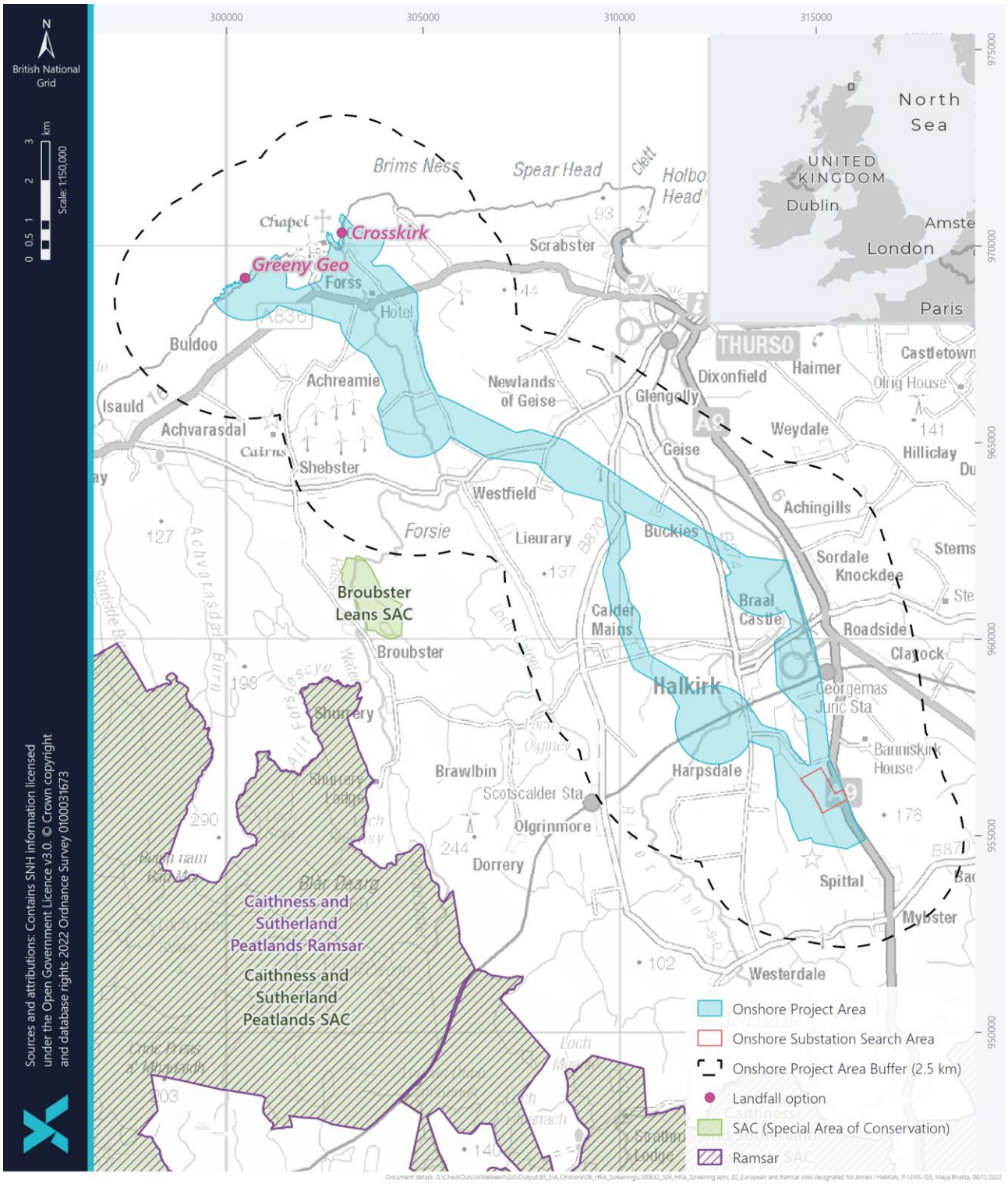

Figure 4-1 European sites designated for Annex I habitats in proximity to the onshore Project area

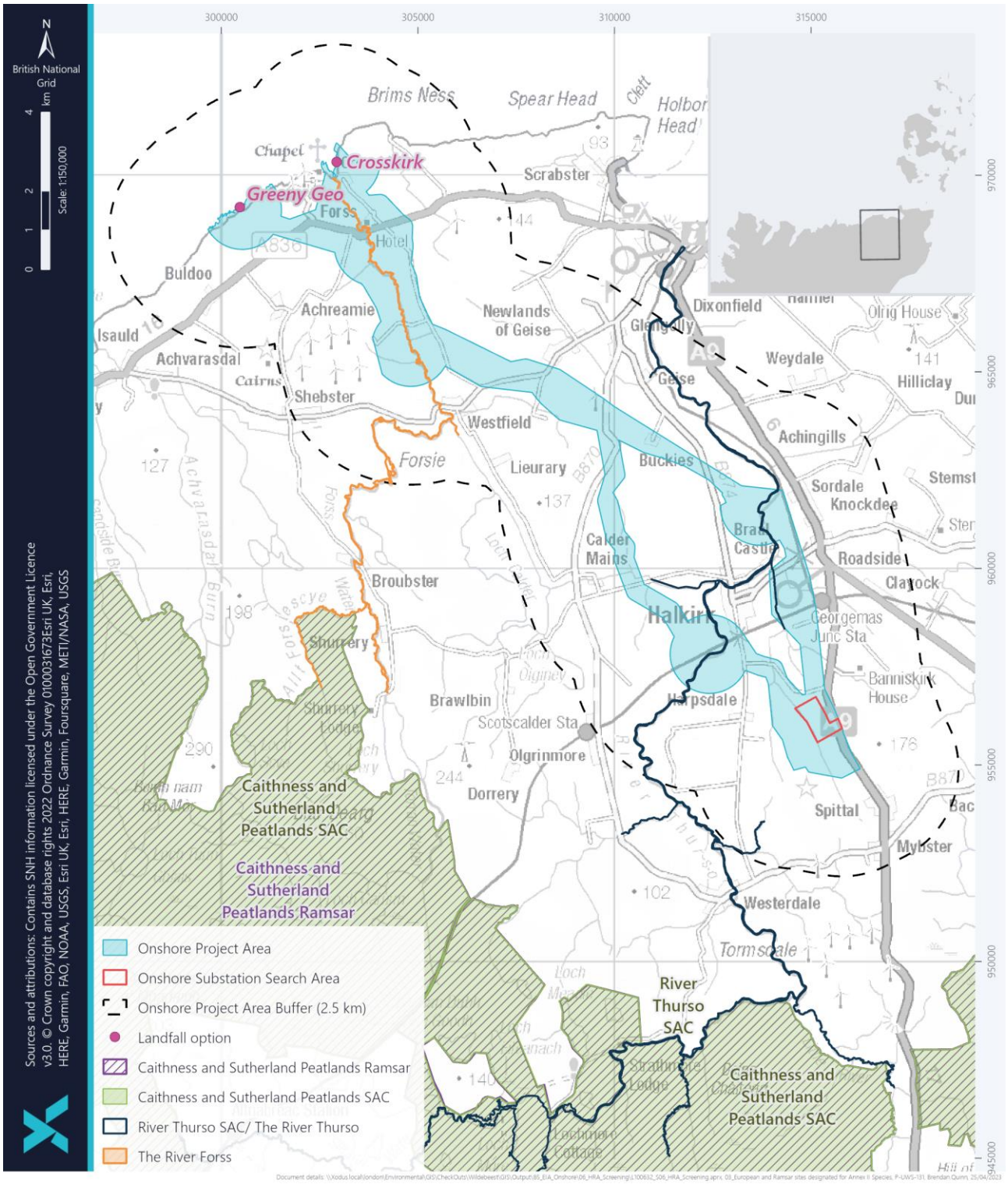

Figure 4-2 European sites designated for Annex II species in proximity to the onshore Project area

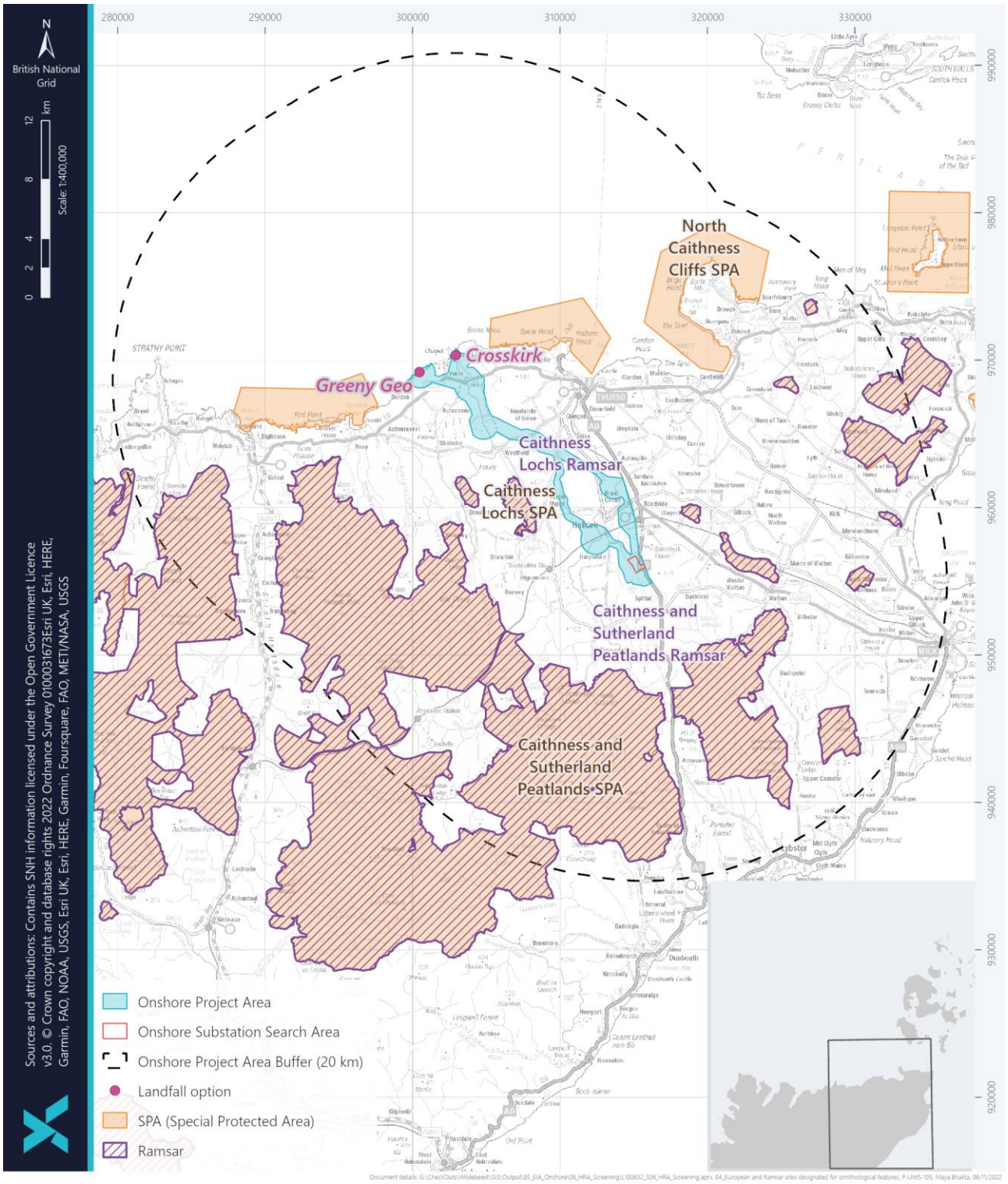

Figure 4-3 European sites designated for ornithology features in proximity to the onshore Project area

4.1.3 Determination of no Likely Significant Effect (LSE)

Where it was identified that there is connectivity between the onshore Project and the qualifying interests of a European site, further appraisal was undertaken to determine whether, as a result of this connectivity, no potential LSE can be concluded.

In order to determine no potential LSE, it is necessary to:

- Determine whether that qualifying feature(s) would, by virtue of its behavioural and foraging characteristics, be affected by a particular effect (species sensitivity); and
- Where a qualifying feature is likely to be affected by an effect, identify whether or not this is likely to have a significant effect on the conservation objectives for the site (conclusion of potential LSE or no potential LSE).

The assessment of no potential LSE combines information on effect pathways and characteristics of qualifying interests as part of a high-level appraisal to determine whether or not there is potential for any of the conservation objectives relating to the qualifying interests of a European site to be undermined on the basis of the potential effects. Where there is no potential for the conservation objective to be undermined, no potential LSE is concluded.

4.2 Screening conclusions

4.2.1 Receptors screened in

Table 4-2 presents a summary of the European sites for which LSE could not be ruled out. This considers the findings of the Onshore HRA Screening Report (OWPL, 2023a) and the HRA Screening Response (THC, 2023), which was in agreement with the European sites and features proposed to be screened into the RIAA within the Onshore HRA Screening Report.

Table 4-2 Summary of designated sites and features for which LSE could not be ruled out

TOPIC	EUROPEAN SITE NAME	QUALIFYING FEATURES SCREENED IN	DISTANCE TO ONSHORE PROJECT AREA (KM)
European sites Designated for Annex II Species	Caithness and Sutherland Peatlands SAC and Ramsar site	• Otter (*Lutra lutra*)	5.4
	River Thurso SAC	• Atlantic salmon *(Salmo salar)*	0

TOPIC	EUROPEAN SITE NAME	QUALIFYING FEATURES SCREENED IN	DISTANCE TO ONSHORE PROJECT AREA (KM)
European sites Designated for Ornithological Features	North Caithness Cliffs SPA	• Peregrine *(Falco peregrinus)* – breeding	1.4
	Caithness Lochs SPA and Ramsar site	• Whooper swan *(Cygnus cygnus)* – non-breeding • Greenland white-fronted goose *(Anser albifrons flavirostris)* – non-breeding • Greylag goose *(Anser anser)* - non- breeding	1.6
	Caithness and Sutherland Peatlands SPA	• Golden eagle *(Aquila chrysaetos)* - breeding	5.4
	Caithness and Sutherland Peatlands Ramsar site	• Greylag goose – breeding	5.4

4.2.2 Receptors screened out

Table 4-3 presents a summary of the European sites for which LSE could be ruled out. This considers the findings of the Onshore HRA Screening Report (OWPL, 2023a) and the HRA Screening Response (THC, 2023). Details on the feedback provided in the HRA Screening Response is included in section 5.

Table 4-3 Summary of designated sites and features for which LSE could be ruled out

TOPIC	EUROPEAN SITE NAME	QUALIFYING FEATURES SCREENED OUT	DISTANCE TO ONSHORE PROJECT AREA (KM)
European sites Designated for Annex I Habitats	Caithness and Sutherland Peatlands SAC	• Depressions on peat substrates; • Blanket bog; • Wet heathland with cross-leaved heath; • Very wet mires often inundated by an unstable 'quaking' surface; • Acid peat-stained lakes and ponds; and • Clear-water lakes with aquatic vegetation and poor to moderate nutrient levels.	5.4

TOPIC	EUROPEAN SITE NAME	QUALIFYING FEATURES SCREENED OUT	DISTANCE TO ONSHORE PROJECT AREA (KM)
	Caithness and Sutherland Peatlands Ramsar site	• Blanket bog (including vegetation and surface pattern types not found elsewhere); • Mire; • Oligotrophic lochs, dystrophic lochs, lochans and pool; • Fen; • Wet heath; • Mosaics of grassland and river within blanket bog and mire; • Sphagnum (*lindbergii and S. majus)* (Nationally scarce mosses); and • Bog orchid (*Hammarbya paludosa*) (Nationally scarce higher plant).	5.4
	Broubster Leans SAC	• Internationally important very wet mire habitat with unstable quaking surface.	2.8
European sites Designated for Annex II Species	Caithness and Sutherland Peatlands SAC	• Marsh saxifrage *(Saxifraga hirculus)*	5.4
	Caithness and Sutherland Peatlands Ramsar site	• Freshwater pearl mussel *(Margaritifera margaritifera)*	5.4
European sites Designated for Ornithological Features	North Caithness Cliffs SPA	• Guillemot *(Uria aalge)* – Breeding; • Fulmar *(Fulmarus glacialis)* – Breeding; • Kittiwake *(Rissa tridactyla)* – Breeding; • Puffin *(Fratercula arctica)* – Breeding; and • Razorbill *(Alca torda)* – Breeding.	1.4
	Caithness and Sutherland Peatlands SPA	• Red-throated diver (*Gavia stellata*) – Breeding; • Black-throated diver (*Gavia arctica*) – Breeding; • Common scoter (*Melanitta nigra*) – Breeding; • Dunlin (*Calidris alpina schinzii*) – Breeding; • Golden plover (*Pluvialis apricaria*), – Breeding; • Greenshank (*Tringa nebularia*) – Breeding; • Hen harrier (*Circus cyaneus*) – Breeding; • Merlin (Falco columbarius) – Breeding;	5.4

TOPIC	EUROPEAN SITE NAME	QUALIFYING FEATURES SCREENED OUT	DISTANCE TO ONSHORE PROJECT AREA (KM)
		• Short-eared owl (*Asio flammeus*) – Breeding; • Wigeon (*Anas penelope*) – Breeding; and • Wood sandpiper (*Tringa glareola*) – Breeding.	
	Caithness and Sutherland Peatlands Ramsar	• Dunlin – Breeding; • Red-throated diver – Breeding; • Black-throated diver – Breeding; • Golden plover – Breeding; • Wood sandpiper – Breeding; • Wigeon - Breeding; • Common scoter – Breeding; and • Greenshank– Breeding.	5.4

4.3 Developments screened in for in-combination assessment

A staged approach was undertaken during the HRA Screening to screen in the relevant in-combination projects, plans and activities for consideration within this RIAA, which has followed the same approach for the EIA: This approach is detailed below:

- Step 1: Compilation of the Project long-list:
  First, a 'long-list' of projects was collated, based on defined ZoI's for each receptor and/or input from consultation meetings with relevant consultees. The ZoI's provide the maximum search areas for other projects or plans to be screened into the in-combination project long-list. For all receptors considered, operational projects are considered as part of the existing baseline, to be considered as part of the onshore Project-specific effect assessment and are therefore not considered within the in-combination effect assessment. For the receptors screened in as detailed above in section 4.2.1, the following ZoI's and or rationale has been used to collate the long-list of projects:
  – European / Ramsar sites designated for Annex II species (Otter) – the ZoI for projects considered is dependent upon the foraging range of otters, the list of projects has been collated based on discussions with NatureScot (see Table 4-4).
  – European / Ramsar sites designated for Annex II species (Atlantic salmon) – Projects with a red line boundary that borders, or is within, a channel of the River Thurso catchment.
  – European / Ramsar sites designated for ornithological features – the ZoI for projects considered is dependent upon the foraging range of designated ornithological features within each SPA; the list of projects has been collated based on discussions with NatureScot (see Table 4-4).

- Step 2: Compilation of project short-list:
  The long-list of projects was then reduced to a short-list by considering the potential pathways of effect (e.g., temporal and physical overlap of effects). Additional information was gathered on each project during the collation of the project long-list, to understand the activities, timescales and nature of the projects identified. This additional information was reviewed to determine the potential channels for in-combination effect, taking into consideration potential effect pathways and/or the potential for physical or temporal overlap of effects from other project activities and those of the onshore Project. The most up-to-date publicly available information in relation to the relevant project parameters was used to inform the in-combination assessment.

When completing the in-combination assessment, it is important to consider that some proposed developments may not be taken forward and built out as currently described, and therefore, there is a level of uncertainty with respect to the potential effects which may arise. The 'stage' of a development, in relation to the certainty or uncertainty over whether the development will be brought forward as described, has been considered when drawing conclusions on in-combination effects within this RIAA.

4.3.1 Developments screened in for the in-combination effects assessment

Table 4-4 details the Projects which have been screened in for the assessment of in-combination effects in the RIAA, based on the approach described above. The location of these projects in relation to the onshore Project area is also shown in Figure 4-4 below.

A justification detailing the decision for the developments taken forward is also provided where appropriate. The assessment of in-combination effects is presented in the topic-specific assessment sections presented within this RIAA.

Table 4-4 Developments screened into the RIAA for each receptor group

DEVELOPMENT (PLANNING REFERENCE)	TYPE	STATUS	DISTANCE FROM ONSHORE PROJECT AREA (KM)	RATIONALE FOR SCREENING IN PROJECT
European sites Designated for Annex II Species (Otter)				
Forss Wind Farm Extension *(20/04455/FUL)*	Onshore Wind Farm	Application	0.51	As per consultation with NatureScot in relation to the scope of the terrestrial non-avian ecology EIA, it was agreed that the focus of the cumulative assessment would be in relation to large scale developments e.g., the
Limekiln Extension (20/01905/S36)	Onshore Wind Farm	Consented	5.53	
Corsback Hill Wind Farm *(22/00790/SCO)*	Onshore Wind Farm	Pre-application	6.2	

DEVELOPMENT (PLANNING REFERENCE)	TYPE	STATUS	DISTANCE FROM ONSHORE PROJECT AREA (KM)	RATIONALE FOR SCREENING IN PROJECT
Loch Toftinghall Wind Farm *(19/02384/SCOP)*	Onshore Wind Farm	Pre-application	3.28	transmission infrastructure located at the onshore substation search area, and windfarm developments close to the onshore Project area. It is considered that this advice is applicable to the HRA and as such those projects identified are screened in for the in-combination assessment within the RIAA.
Tormsdale Wind Farm *(21/04984/S36)*	Onshore Wind Farm	Application	4.75	
Watten Wind Farm (22/02644/SCOP)	Onshore Wind Farm	Pre-application	5	
SHET Dounreay West Substation *(19/01092/FUL)*	Transmission infrastructure – Substation Plant	Consented	2.3	
Pentland Floating Offshore Wind Farm Onshore Substation *(22/04722/PIP)*	Transmission infrastructure – Substation Plant	Consented	2.35	
ESB Asset Development Synchronous Compensator*(20/05118/FUL)*	Transmission infrastructure – Substation Plant	Application	0	
High Voltage underground Spittal Synchronous Compensator Grid Connection *(22/00016/FUL)*	Transmission infrastructure - Cables	Consented	0	
European sites Designated for Annex II Species (Atlantic salmon)				
Tormsdale Wind Farm *(21/04984/S36)*	Onshore Wind Farm	Application	4.75	These developments have a red line boundary that borders, or is within, a channel of the River Thurso catchment.
ESB Asset Development Synchronous Compensator*(20/05118/FUL)*	Transmission infrastructure – Substation Plant	Application	0	
High Voltage underground Spittal Synchronous Compensator Grid Connection *(22/00016/FUL)*	Transmission infrastructure - Cables	Consented	0	

DEVELOPMENT (PLANNING REFERENCE)	TYPE	STATUS	DISTANCE FROM ONSHORE PROJECT AREA (KM)	RATIONALE FOR SCREENING IN PROJECT
European sites Designated for Ornithological Features				
Forss Wind Farm Extension *(20/04455/FUL)*	Onshore Wind Farm	Application	0.51	As per consultation with NatureScot in relation to the scope of the terrestrial ornithology EIA, it was agreed that the focus of the cumulative assessment would be in relation to large scale developments e.g., the transmission infrastructure located at the onshore substation search area, and windfarm developments close to the onshore Project area. It is considered that this advice is applicable to the HRA and as such those projects identified are screened in for the in-combination assessment within the RIAA.
Limekiln Extension (20/01905/S36)	Onshore Wind Farm	Consented	5.53	
Corsback Hill Wind Farm *(22/00790/SCO)*	Onshore Wind Farm	Pre-application	6.2	
Loch Toftinghall Wind Farm *(19/02384/SCOP)*	Onshore Wind Farm	Pre-application	3.28	
Tormsdale Wind Farm *(21/04984/S36)*	Onshore Wind Farm	Application	4.75	
Watten Wind Farm (22/02644/SCOP)	Onshore Wind Farm	Pre-application	5	
SHET Dounreay West Substation *(19/01092/FUL)*	Transmission infrastructure – Substation Plant	Consented	2.3	
Pentland Floating Offshore Wind Farm Onshore Substation *(22/04722/PIP)*	Transmission infrastructure – Substation Plant	Consented	2.35	
ESB Asset Development Synchronous Compensator*(20/05118/FUL)*	Transmission infrastructure – Substation Plant	Application	0	
High Voltage underground Spittal Synchronous Compensator Grid Connection *(22/00016/FUL)*	Transmission infrastructure - Cables	Consented	0	

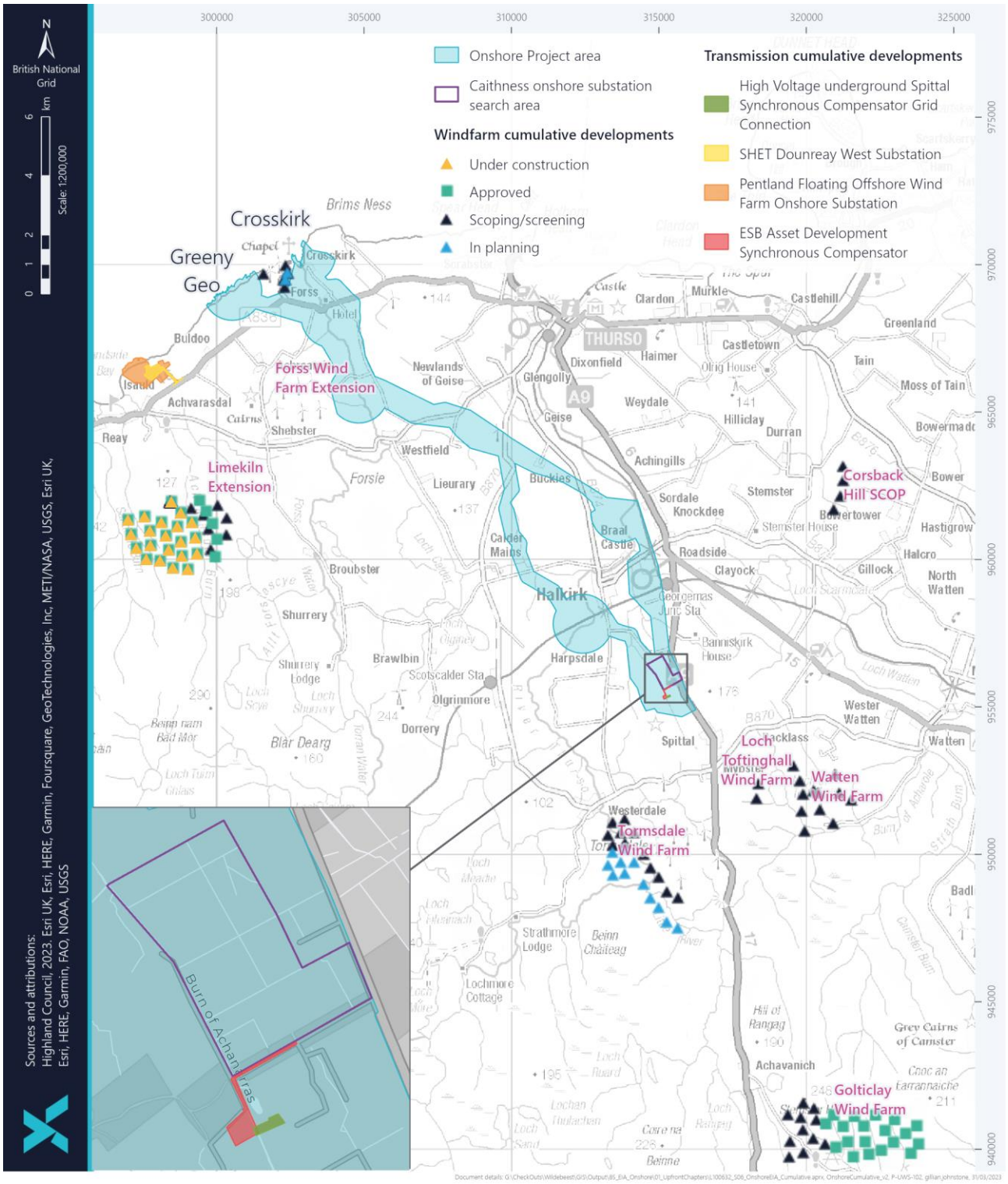

Figure 4-4 Location of the projects screened in to the in-combination assessment within this RIAA

5 HRA CONSULTATION

5.1 Consultation and HRA Screening

As part of Stage One of the HRA process, consultation with key stakeholders was undertaken. As outlined above, the Onshore HRA Screening Report (OWPL, 2023a) was submitted to THC in April 2023 and outlined the details of the onshore Project and an assessment of whether, in view of best scientific knowledge, there was the potential for the onshore Project, individually or in combination with another plan or project, to have potential for LSE on a European site. A Screening Response was received from THC in June 2023 which provided comments from THC and NatureScot. These comments, together with responses from the Applicant have been summarised in Table 5-1.

Table 5-1 Summary of HRA consultation feedback and responses

CONSULTEE	TOPIC	CONSULTEE COMMENT	RESPONSE
General			
THC	Summary	Please see attached Nature Scot's response to the Onshore HRA Screening Report. I have checked with the Council's Ecologist and they have nothing to add to NatureScot's comments.	Noted, responses to NatureScot comments are provided below.
NatureScot[6]	Summary	We advise the proposal will result in significant effect on the environment due to connectivity with River Thurso SAC, Caithness and Sutherland Peatlands SAC, Caithness Lochs SPA, North Caithness Cliffs SPA and Caithness and Sutherland Peatlands SPA. Should The Highland Council determine that an EIA is required, we believe this information can be provided in a focused EIA report, concentrating on our interests described below. Alternatively, if it is determined that an EIA is not required, this information could be provided in the form of a targeted environmental report.	Noted, these European sites have been screened into this RIAA and specific advice in relation to these sites, as detailed below, has been incorporated into the assessment of adverse effects. The assessments presented within this document are required under the Habitats Regulations (see section 3.1). An EIA is also required to support the PPP Application to THC under the Town and Country Planning (Scotland) Act 1997 (as amended). An assessment under this legislative framework is provided in a separate Onshore EIA Report.
NatureScot	General Advice	Please note that the advice does not list all the potential impacts on the environment. There may be other impacts at this site that would require assessment and we highlight that cumulative effects of the proposal with other developments in this area will also need to be carefully considered.	Noted, impacts pertaining to the assessment of adverse effects on European sites are presented within this RIAA. This RIAA also includes an assessment of in-combination effects as detailed in section 4.3 above. Other impacts, not related to the HRA are assessed within the Onshore EIA Report, along with cumulative impacts.

[6] *The response received from NatureScot on the HRA screening report was provided under the EIA Regulations, discussion with THC confirmed that although response was not addressed to the HRA Regulations the content is still relevant. Therefore, it should be noted that this RIAA follows the HRA Regulations and where non-European sites (i.e. SSSIs) are mentioned these are subsequently addressed within the Onshore EIA Report.*

CONSULTEE	TOPIC	CONSULTEE COMMENT	RESPONSE
NatureScot	Concluding remarks	Please note that our advice is given without prejudice to a full and detailed consideration of the impacts of the proposal if it is submitted as a formal application.	Noted.
European sites with Annex II Species			
NatureScot	River Thurso SAC	The proposal crosses the SAC, designated for its Atlantic salmon. As the proposal crosses the SAC, then during both construction and operation it has the potential to impact upon Atlantic salmon. These include the loss and damage to habitat, the interruption to fish passage and watercourse connectivity, pollution impacts as well as disturbance to the species. Similar impacts from activities within watercourses connected with the SAC could also occur. Therefore, further assessment of the potential impacts to this SAC will be required.	Noted, impacts pertaining to the assessment of adverse effects on the River Thurso SAC are presented within this RIAA. This RIAA also includes an assessment of in-combination effects as detailed in section 4.3 above. Other impacts, not related to HRA legislation are assessed within the Onshore EIA Report, along with cumulative impacts.
NatureScot	River Thurso SAC	The Screening Report highlights that pollution events during construction and operation could have the potential to damage habitat and result in direct mortality to salmon. However, it concludes that the implementation of embedded best practice measures, such as pollution prevention control mechanisms and emergency procedures for accidental releases, will significantly reduce the likelihood and impact of pollution effects. We advise that details of such embedded mitigation measures will be required as part of any future application to inform our assessment of potential impacts to the SAC.	Noted. A summary of the embedded mitigation relating to pollution prevention control is provided in Table 6-4 and Table 6-5. An Outline CEMP has also been submitted alongside the Application for PPP, which provides further details of the pollution prevention control measures to be implemented. These measures will be finalised within a Pollution Prevention and Control Plan appended to the final CEMP post-consent (See OMP1: Outline CEMP for further details). Additionally, an outline Drainage Strategy has also been prepared and submitted alongside the Application for PPP (see SS3: Flood Risk and Drainage Assessment). The final Drainage Strategy and Flood Risk Plan will be developed and appended to the final CEMP post-consent.

CONSULTEE	TOPIC	CONSULTEE COMMENT	RESPONSE
NatureScot	Caithness and Sutherland Peatlands SAC	The proposal lies approximately 5.4 km from the SAC, designated for its peatland habitat, otter and marsh saxifrage. Both the River Forss and River Thurso are potentially used for foraging and commuting by otter and the proposal lies within foraging range from the SAC. Therefore, at points where the proposals cross these rivers, works have the potential to result in impacts to supporting habitat, holts or resting places and the risk of direct injury or mortality. Therefore, any future application will need to fully consider impacts to SAC otter. We advise that any survey work undertaken for otter follows our recommended guidance.	Due to the distance of the onshore Project area from the Caithness and Sutherland Peatland SAC, no impacts upon habitat features associated with this protected site are predicted. However, as otter can occupy long stretches of riparian habitat, it is possible that those associated with the SAC may forage within the onshore Project area. Therefore, as onshore construction may result in the temporary loss or severance of otter foraging habitat, as well as direct injury or mortality to otter and/or destruction or disturbance to otter holts or resting places, impacts upon the qualifying feature of the SAC may be predicted. Detailed surveys of the onshore Project area, including a 250 m buffer, were undertaken following appropriate methodology and guidance. The results were analysed and the potential impacts upon otter are fully detailed in chapter: 10 Terrestrial non-avian ecology of the Onshore EIA Report and are further considered in this HRA RIAA in section 6.
NatureScot	Caithness and Sutherland Peatlands SAC	As with our comments relating to the River Thurso SAC, any embedded mitigation measures (such as pollution prevention measures) that are relevant to otter, should be detailed within any future planning application.	OMP1: Outline CEMP is provided alongside the PPP Application and provides an overview of the pollution prevention controls which will be adhered to. The final CEMP, to be submitted post-consent, will include a Pollution Prevention and Control Plan, in accordance with SEPA's Pollution Prevention Guidelines. Measures will include the utilisation of best practice sediment management and pollution prevention techniques. The impacts of the work will also be reduced by minimising the number of watercourse crossings where possible, and the impact of each crossing will be reduced through the implementation of appropriate trenchless techniques. The removal and appropriate storage of turfs, topsoil and subsoil (as required) will allow the reinstatement of habitats following construction works. Additionally, a Species and Habitat Protection Plan(s) (SHPP) will also be prepared post-consent to ensure that measures are taken to prevent harm to otter during works. These mitigation measures will be embedded within the overall Project design and secured within PPP conditions. See Table 6-5 for further detail.

CONSULTEE	TOPIC	CONSULTEE COMMENT	RESPONSE
NatureScot	Caithness and Sutherland Peatlands SAC	The proposal lies downstream from the SAC along the River Forss and River Thurso. Therefore, there is no hydrological connection between the habitat and marsh saxifrage features. The distance between the sites also means that impacts to SAC habitats and marsh saxifrage are considered unlikely.	Due to the distances between the onshore Project area and the Caithness and Sutherlands Peatlands SAC, and the fact that the proposal lies downstream of this protected area, no pathway for effect upon the habitat features associated with the SAC, including marsh saxifrage, are predicted. As such these features have not been screened in to the assessment presented within this RIAA.
European sites Designated for Ornithological Features			
NatureScot	Caithness Lochs SPA	The proposals lie 1.6 km from Caithness Lochs SPA, designated for wintering whooper swan, Greenland white-fronted goose and greylag goose. The proposal lies outside disturbance distance from the SPA roosting sites. However, the proposed route will be within foraging range for all 3 species. Therefore, the proposal could result in disturbance, displacement and loss of habitat during construction and potential maintenance activities during operation. Therefore, further assessment of the potential impacts to this SPA will be required. The applicant should also be aware that some of the fields in and around the proposal area are important for SPA Greenland white-fronted geese. We highlight that, given their small population and restricted feeding regime, any impacts to this species could be significant.	Section 7.7 of this RIAA assesses adverse effects from the onshore Project on foraging and roosting Greenland white-fronted goose, greylag goose and whooper swan that are designated features of the Caithness Lochs SPA. Impacts of disturbance, displacement and loss of habitat during construction and potential maintenance activities during operation are all considered in the assessment. Greenland white-fronted goose foraging areas within and close to the onshore Project area that are considered important by NatureScot (Jonathan Swale, pers. comm. 2023) are included in the assessment.
NatureScot	North Caithness Cliffs SPA	The Screening Report states that the proposal lies 1.4 km from North Caithness Cliffs SPA, designated for its breeding seabird and peregrine falcon. We note the Screening Report identifies that the proposal lies within core range for foraging peregrine. Where connectivity exists with this species, we agree that further consideration should be provided within any future planning application.	Section 7.6 of this RIAA assesses adverse effects from the onshore Project on breeding peregrine that is a designated feature of the North Caithness SPA.

CONSULTEE	TOPIC	CONSULTEE COMMENT	RESPONSE
NatureScot	North Caithness Cliffs SPA	We further note that impacts to breeding guillemot, kittiwake, puffin and razorbill will not be considered as part of the works as the proposal is outwith disturbance distance from nesting sites and these species forage offshore. While this seems reasonable in relation to the onshore elements of the proposal, we highlight that this SPA should be considered in relation to future applications for the offshore elements (including the cable export route, which will cross the intertidal area and make landfall onshore).	Noted. The North Caithness Cliffs SPA has been considered in the associated Offshore RIAA for the offshore Project (OWPL, 2023b).
NatureScot	Caithness and Sutherland Peatlands SPA	The proposal lies approximately 5.4 km from the SPA, designated for its upland breeding bird features. We note the Screening Report identifies that the proposal lies within foraging range for golden eagle. Where connectivity exists, we agree that further assessment should be undertaken to inform a future planning application.	Section 7.8 assesses the Caithness and Sutherland Peatlands SPA. Baseline surveys undertaken for the onshore Project did not record any golden eagles within the onshore 2 km study area. For this reason, impacts on golden eagle were initially screened out of this RIAA as per the HRA Screening Report. Nonetheless, for completeness this is now assessed in this RIAA as per section 7.8.
NatureScot	Caithness and Sutherland Peatlands SPA	Based on the information available, we do not anticipate significant effects on other breeding features of the SPA due to the lack of suitable habitat in the vicinity of the proposal, or the proposal being out with the foraging ranges and disturbance distances for the species.	Noted, all designated bird features of the Caithness and Sutherland Peatlands SPA were screened out of the assessment. Section 7.8 assesses impacts of the onshore Project on breeding greylag goose which is a feature of the Caithness and Sutherland Peatlands Ramsar site.
Other advice			
NatureScot	Sites of Special Scientific Interest (SSSIs)	The proposal lies close to a number of SSSIs including Ushat Head SSSI, River Thurso SSSI, Achanarras Quarry SSSI, Lambsdale Leans SSSI, Loch Lieurary SSSI and Westfield Bridge SSSI. Any future application will also need to consider the potential impacts to these sites. Further information on these sites can be found on SiteLink https://sitelink.nature.scot/home.	An assessment of potential impacts and resulting environmental effects on these SSSIs have been considered as part of the onshore EIA and not this RIAA as they do not form part of the HRA process, as detailed in section 3.1.

6 EUROPEAN SITES DESIGNATED FOR ANNEX II SPECIES

6.1 Introduction

This section provides an assessment of the adverse effects from the onshore Project on SACs and Ramsar sites designated for the conservation of Annex II species which have been screened into the assessment. This section also provides information used to assess adverse effects of the onshore Project on the conservation objectives of the SACs screened in for assessment.

6.2 Summary of HRA Screening

6.2.1 SACs and Ramsar sites screened in for assessment

Table 6-1 presents the SACs that have been screened into the assessment, in accordance with feedback in the HRA Screening Response (see section 5).

Table 6-1 List of European sites designated for Annex II species considered within this RIAA

SITE NAME	QUALIFYING INTEREST / FEATURES	DISTANCE TO ONSHORE SUBSTATION SEARCH AREA (KM)	DISTANCE TO ONSHORE EXPORT CABLE CORRIDOR (KM)
Caithness and Sutherland Peatlands SAC / Ramsar	Otter	7.0	5.4
River Thurso SAC	Atlantic Salmon	2	0 (overlaps the onshore export cable corridor

6.2.2 Pathways for LSE screened in

The impact pathways for which potential LSE could not be ruled out during HRA Screening are presented in Table 6-2.

Table 6-2 Impact pathways screened into the RIAA for Annex II species

RECEPTOR	PROJECT STAGE	POTENTIAL PATHWAY
Otter	Construction and decommissioning	• Direct loss or fragmentation of suitable otter foraging and commuting habitat due to land-take. • Potential for direct loss, damage or disturbance to otter holts during construction works. • Potential for direct injury or mortality to otter through the movement of plant and other site vehicles through the site and due to deep excavations and uncapped piping. • Direct disturbance to commuting or foraging otter. • Indirect impacts to otter and their foraging and commuting habitats.
	Operation and maintenance	• Direct loss or fragmentation of suitable otter foraging and commuting habitat through operation and maintenance activities. • Potential for direct loss, damage or disturbance to otter holts during operation and maintenance works. • Potential for direct injury or mortality to otter through the movement of maintenance vehicles through the site during the operation and routine maintenance of the site. • Direct disturbance to commuting or foraging otter. • In-direct impacts to otter and their foraging and commuting habitats.
Atlantic salmon	Construction and decommissioning	• Potential pollution of salmonid habitat from silt, hydrocarbons, fuel, chemicals, concrete leachate and other pollutants either from direct impacts of HDD operations on the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies. • Potential direct damage to salmonid habitat from HDD operations that will be used to lay cables under the River Thurso. • Potential interruptions to watercourse connectivity and salmonid migration from temporary or permanent structures, chemical barriers, percussive barriers or morphological changes either directly from HDD operations under the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies.

RECEPTOR	PROJECT STAGE	POTENTIAL PATHWAY
		• Potential indirect pollution of salmonid habitat from the operating onshore substation SuDS and sewage treatment system which will discharge into a tributary connected to the River Thurso. • Potential pollution or damage to salmonid habitat from maintenance that requires excavation activities, e.g., cable replacement or repair either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies.
	Operation and maintenance	• Potential indirect longer-term consequences of HDD on riverbank stability, channel morphology and flow regime. • Potential direct disturbance to sensitive species from the Electromagnetic Field (EMF) under the River Thurso and at connecting watercourses. • Potential interruptions to watercourse connectivity and salmonid migration from permanent structures, chemical barriers, or morphological changes either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies.

6.2.3 Pathways for LSE screened out

Following the assessment during HRA Screening and receipt of the HRA Screening Response (THC, 2023), and in line with the position that embedded mitigation is not to be included for the purposes of determining the potential of LSE, no potential impact pathways have been screened out of the assessment.

6.3 Design envelope parameters relevant to Annex II species

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

Table 6-3 and Table 6-4 present the worst case scenario design parameters for potential impacts to otter and Atlantic salmon during the construction, operation and maintenance, and decommissioning stages of the onshore Project.

Table 6-3 Design parameters specific to otter

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
Construction and decommissioning*	
Direct loss or fragmentation of suitable otter foraging and commuting habitat due to land-take.	Construction activity will last up to of four years. Direct habitat loss during the preparation of working areas, excavation activities and the storage of materials are considered to result in the greatest impact upon otter within the onshore Project area and the wider study area. The following activities are considered to represent the worst case scenario with regard to the potential for direct impacts upon otter. Landfall • Preparation of the working area at the landfall site to accommodate up to six boreholes (5 plus 1 contingency), HDD drilling equipment, utilities and welfare facilities with an estimated area of 7,500 m^2; and • Storage of excavated materials from the boreholes prior to disposal off-site. Onshore export cable corridor • Construction and reinstatement of temporary laydown areas and access roads for cable installation works estimated to be every 2 km along the route with a total of 130,000 m^2 along the cable corridor; • Ditches and small watercourses (including those that don't feature on a 1:50,000 OS map) that are crossed by the onshore Project haul roads will have appropriately sized pipework installed to maintain water conveyance capacity. Such pipework will be removed when the haul roads are removed; • Excavation of trenches and storage of excavated materials estimated to be 162,525 m^3 per trench (five trenches); and • Working corridor estimated to be up to 33 km long and 100 m wide. Onshore substation • Preparation of temporary work compound for substation – 62,500 m^2 (including compound and welfare facilities); and • Substation permanent area (including landscaping and Sustainable Drainage Systems (SuDS) allowance) of approximately 23.9 ha, with maximum excavated material 1,207,000 m^3. Access tracks • Approximately 5 km of permanent access tracks. 24% (1.2 km) are existing tracks, 44% (2.21 km) are existing tracks that require improvements and 33% (1.67 km) will be newly installed tracks. • Temporary access tracks (not including haul roads) up to 3,300 m in length at the landfall, the entry and exit points of the HDD points and the onshore substation. Lengths are indicative only.

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
	• Further access roads to haul roads along the cable route will be required but have not been identified at this stage. Construction traffic • The most intensive traffic is expected to occur between Year 2 Q2 and Year 3 Q2, with the maximum predicted in Q3 of the Year 2 of construction with an average of 632 construction HGV vehicle trips per day, or an average maximum of 53 two-way HGV vehicle movements each hour, based on a 12-hour working day.
Potential for direct loss, damage or disturbance to otter holts during construction works.	• Design envelope scenarios assessed as above.
Potential for direct injury or mortality to otter through the movement of plant and other site vehicles through the site and due to deep excavations and uncapped piping.	• Design envelope scenarios assessed as above.
Direct disturbance to commuting or foraging otter.	• Design envelope scenarios assessed as above.
Indirect impacts to otter and their foraging and commuting habitats.	In the absence of appropriate mitigation, there is the potential for indirect impacts upon otter and their foraging and commuting habitats. Such indirect effects may occur as a result of accidental release, resulting in the contamination of groundwater and watercourses during the construction of the onshore Project. This would result in a reduction in water quality, with direct effects on the availability and quality of the fish prey species. Other potential indirect impacts include sediment pollution, and the effects of construction dust, noise and light pollution. The following activities are considered to represent the worst case scenario with regard to the potential for indirect impacts upon otter. Landfall • Preparation of the working area at the landfall site to accommodate a maximum of six boreholes, HDD drilling equipment, utilities and welfare facilities with an estimated area of 7,500 m^2; • Storage of excavated materials from the boreholes prior to disposal off-site; • Materials used during drilling of bores, e.g., drilling muds and grout; and • Fuel used in plant machinery. Onshore export cable corridor • Construction and reinstatement of temporary laydown areas and access roads for trench / HDD works estimated to be every 2 km along the route;

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
	• Ditches and small watercourses that are crossed by the onshore Project haul roads will have appropriately sized pipework installed to maintain water conveyance capacity. Such pipework will be removed when the haul roads are removed; • Excavation of trenches / HDD and storage of excavated materials estimated to be 162,525 m^3 per trench (five trenches); and • Working corridor estimated to be 33 km long and 100 m wide. Onshore substation • Potential for on-site batching of concrete; • SuDS will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and Shunt Reactor bunds will discharge to the surface water drainage system through a bund water control unit; • Appropriate measures will also be employed to intercept run-off from the work site, for example using silt fences, check dams and settlement ponds to reduce the suspended sediment load of the water prior to any potential discharge into watercourses; • Installation of septic tank system and subsequent discharges; and • Fuel used in plant machinery. Further details of the drainage strategy mechanisms are provided in the Outline Drainage Strategy presented within SS3: Flood Risk and Drainage Assessment.
Operation and maintenance	
Direct loss or fragmentation of suitable otter foraging and commuting habitat through operation and maintenance activities.	Onshore substation • Post construction, the temporary works will be removed and the ground re-instated. The only permanent structures will be the onshore substation (maximum of 12 buildings / areas anticipated), associated hardstanding and permanent access tracks; and • Maximum onshore substation footprint of 239,200 m^2 including screening measures.
Potential for direct loss, damage or disturbance to otter holts during operation and maintenance works.	Onshore substation The onshore substation will be unmanned. Therefore, there will be a limited amount of traffic (predominantly light-vehicle traffic) to and from the substation for general operation and maintenance purposes. • Bi-weekly visual inspection and replace fault items under warranty; and • Additional plant maintenance quarterly. Onshore cables; routine maintenance • Bi-annual visual inspection of joint bays / TJB / earth link boxes.

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
	Non-routine maintenance activities • As required following events causing deterioration or damage to areas surrounding cables; and • Reactive maintenance to faults / failure rates of key plant items. Traffic • Estimated traffic volume is around one vehicle per week. Operational noise at substation • The maximum noise level at the onshore substation is 100 dB(A) noise level 1 m from the main transformer. Lighting • External lighting from 2.2 lux – 150 lux will be used to illuminate buildings and external areas at the substation. 2.5 lux will be required around the perimeter fencing. There may also be a need for up to 150 lux at areas requiring higher level of illumination.
Potential for direct injury or mortality to otter through the movement of maintenance vehicles through the site during the operation and routine maintenance of the site.	• Design envelope scenarios assessed as above.
Direct disturbance to commuting or foraging otter	• Design envelope scenarios assessed as above.
Indirect impacts to otter and their foraging and commuting habitats.	Onshore substation • SuDS system will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and shunt reactor bunds will discharge to the surface water drainage system through a bund water control unit. • Appropriate measures will also be employed to intercept run-off from the work site, for example using silt fences, check dams and settlement ponds to reduce the suspended sediment load of the water prior to any potential discharge into watercourses. • Installation of septic tank system and subsequent discharges. Further details of the drainage strategy mechanisms are provided in the Outline Drainage Strategy presented within SS3: Flood Risk and Drainage Assessment.

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED

**** In the absence of detailed information regarding decommissioning works, the implications for otter, a qualifying feature for the Caithness and Sutherland Peatlands SAC, are considered analogous to or likely less than those of the construction stage. Therefore, the worst case parameters defined for the construction stage also apply to decommissioning.***

Table 6-4 Design parameters specific to Atlantic salmon

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
Construction and decommissioning*	
Potential pollution of salmonid habitat from silt, hydrocarbons, fuel, chemicals, concrete leachate and other pollutants either from direct impacts of HDD operations on the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies.	Landfall • Preparation of the working area at the landfall site to accommodate five boreholes (plus one contingency), HDD drilling equipment, utilities, and welfare facilities with an estimated area of 7,500 m^2; • Storage of excavated materials from the boreholes estimated to be 1,630 m^3 per HDD bore prior to disposal off-site; • Materials used during drilling of bores, e.g., drilling muds and grout; and • Fuel used in plant machinery. Onshore export cable corridor • Construction and reinstatement of temporary laydown areas (estimated to be every 2 km along the route) and access roads for trench / HDD works; • Potential use of trench boxes and/or sheet piling during trenching; • Excavation of trenches / HDD and storage of excavated materials estimated to be up to 162,525 m^3 per trench (five trenches); • Working corridor estimated to be up to 33 km long and 100 m wide; and • Appropriate measures will also be employed to intercept run-off from the work site, for example using silt fences, check dams and settlement ponds to reduce the suspended sediment load of the water prior to any potential discharge into watercourses. Onshore substation • Preparation of temporary work compound for substation – 62,500 m^2 (including compound and welfare facilities); • Substation permanent area (including landscaping and SuDS allowance) of approximately 23.9 ha, with maximum excavated material 1,207,000 m^3; • Potential for on-site batching of concrete;

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
	• SuDS system will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and shunt reactor bunds will discharge to the surface water drainage system through a bund water control unit; and • Installation of septic tank system and subsequent discharges. Water crossing techniques and access • For minor watercourse / ditch crossings dry OCT methodology will be used. In dry open cut methods water flow is maintained by damming and over pumping or using temporary "flume" pipes installed in the bed of the watercourse. Burial depth to be between 1.0 m to 1.8 m. The excavation rate for crossings will be <10 m per day; • HDD or other trenchless techniques (e.g., auger bore or pipe ramming) will be required at significant rivers (the Forss Water and River Thurso) and may exceed a depth of 1.8 m; • Ditches and small watercourses (including those that don't feature on a 1:50,000 OS map) that are crossed by the onshore Project haul roads will have appropriately sized pipework installed to maintain water conveyance capacity. Such pipework will be removed when the haul roads are removed; • Temporary bridges / spanning structures will be considered for appropriate locations for haul roads; and • Permanent access roads will be required at several locations (approximately 5 km in length), with just one crossing over a tributary of the River Thurso, Yellowmoss Burn. Drainage Systems Further details of the drainage strategy mechanisms are provided in the Outline Drainage Strategy presented within SS3: Flood Risk and Drainage Assessment.
Potential direct damage to salmonid habitat from HDD operations that will be used to lay cables under the River Thurso.	• HDD will be required to cross the River Thurso and may exceed a depth of 1.8 m.
Potential interruptions to watercourse connectivity and salmonid migration from temporary or permanent structures, chemical barriers, percussive barriers or morphological changes either directly from HDD operations under the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies.	• Preparation of working areas, excavation activities, use and storage of materials (as described above); • Water crossing techniques (as described above); and • Temporary and permanent access requirements (as described above).

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
Operation and maintenance	
Potential indirect pollution of salmonid habitat from the operating onshore substation SuDS and sewage treatment system which will discharge into a tributary connected to the River Thurso.	• SuDS will be required for surface water drainage. Any areas within the onshore substation where potentially polluting materials will be stored or used are likely to require additional treatment to ensure that spills and leaks do not gain direct access into the groundwater or surface water environments. Such additional treatment is likely to include oil separators, or provision of a self-contained drainage network which is entirely separate from the surface water drainage system; and • Installation of septic tank system and subsequent discharges. Further details of the drainage strategy are provided in the Outline Drainage Strategy presented in SS3: Flood Risk and Drainage Assessment.
Potential pollution or damage to salmonid habitat from maintenance that requires excavation activities, e.g., cable replacement or repair either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies.	• Maintenance activities may be required due to events causing deterioration or damage of areas surrounding cables including other services, crossings, roads, and farmland.
Potential indirect longer-term consequences of HDD on riverbank stability, channel morphology and flow regime.	• Potential impacts from reinstatement process of water crossing techniques and access tracks (as described above).
Potential direct disturbance to sensitive species from the EMF under the River Thurso and at connecting watercourses.	• HDD will be required at the River Thurso and may exceed a depth of 1.8 m.
Potential interruptions to watercourse connectivity and salmonid migration from permanent structures, chemical barriers, or morphological changes either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies.	• Potential impacts from reinstatement process of water crossing techniques and access tracks as described above; and • Maintenance activities may be required due to events causing deterioration or damage of areas surrounding cables including other services, crossings, roads and farmland.

**** In the absence of detailed information regarding decommissioning works, the implications for SACs designated for diadromous fish features are considered analogous to those of the construction stage. Therefore, the worst case parameters defined for the construction stage also apply to decommissioning.***

6.4 Embedded mitigation and management plans relevant to Annex II species

As described in the EIA methodology (Onshore EIA Report, chapter 7: EIA methodology), certain primary embedded mitigation measures have been adopted as part of the Project development process in order to reduce the potential for impacts to the environment. These primary embedded mitigations, relevant to otter and Atlantic salmon, have been accounted for in the assessment of adverse effects on site integrity and are detailed within Table 6-5 below. Additionally, tertiary embedded mitigation measures that apply specifically to otter and Atlantic salmon, such as any management plans to be produced at post-consent for the onshore Project, are also described in Table 6-5.

In accordance with the onshore PPP Application, the embedded primary and tertiary mitigations listed below have been attributed to particular Development Zones within the onshore Project area, these are detailed in Table 6-5 and presented in Figure 6-3 and Figure 6-4, for otter and Atlantic salmon, respectively.

Table 6-5 Embedded mitigation measures relevant to Annex II species

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
Otter				
O1	Onshore cable routeing and avoidance of sensitive areas. The boundary of the onshore Project has been developed to avoid sensitive areas (peatland, Groundwater Dependent Terrestrial Ecosystems (GWDTEs), designated areas) wherever possible. Where impacts cannot be avoided, these will be minimised. Consideration of non-avian ecology sensitivities as part of the constraints mapping exercise to inform final cable routes and associated construction infrastructure. If sensitive areas are unavoidable, targeted specific National Vegetation Classification (NVC) surveys as agreed with NatureScot post-consent will be carried out within a 250 m buffer ahead of construction works to allow for the micrositing of the route to avoid particularly sensitive habitats and notable or protected plant species in the Project area.	Primary	Established within the design principles (secured through CMSs.	All zones
O2	Where possible, the following buffers between GWDTEs and excavations will be implemented: • 250 m for the onshore export cable corridor and any other excavations greater than 1 m in depth; and • 100 m for excavations less than 1 m in depth. If the onshore export cable corridor is located within 250 m of any GWDTEs, clay stoppers will be included in the onshore export cable corridor trench to prevent them from acting as preferential pathways for drainage.	Primary	As per Outline Management Plan (OMP) 1: Outline Construction Environment Management Plan (CEMP), these measures will be established within the Pollution Prevention and Control Plan and the final CEMP. Drainage and Flood Risk Plan which will be appended to the final CEMP. Outline provided within SS3: Flood risk and drainage assessment.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
O3	Return location to pre-construction state (all locations). Once an area is no longer required for construction, it will be re-instated, where possible, to ensure it can return to its original use for the remainder of the construction period and operational period. The only exception to this will be permanent infrastructure including the substation and tracks, where habitat loss will be permanent. 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.	Primary	Established through design principles (secured through CMSs). These measures will also be established within the Habitat Management Plan (HMP) and the SHPP. These plans will be secured through conditions attached to the PPP. Landowner Agreements.	All zones.
O4	Minimisation of watercourse crossings where possible (i.e., reduce the number of crossings and the impact of each crossing through the implementation of appropriate techniques such as HDD).	Primary	Established within the design principles (secured through CMSs) and secured through conditions attached to the PPP.	All zones.
O5	Ensure appropriately qualified Ecological Clerk of Works (ECoW) presence at sensitive locations and/or sensitive periods. The SHPP will include details of a watching brief which will ensure that the correct procedure can be followed if an otter is found during devegetation or ground-breaking works. When the ECoW is not present on site, works must stop within 30 m of the protected species; 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.	Primary	The requirement for ECoW(s) will be secured through a condition attached to the PPP. The SHPP will also include the requirements for ECoW(s). The SHPP will be secured through a condition attached to the PPP. Where appropriate Derogation Licences will be obtained from NatureScot.	All zones.

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
O6	Create and implement SHPP - Measures to prevent harm to otter. Pre-construction surveys for otter will be undertaken to identify any animals making use of the onshore Project area ahead of any works occurring within 200 m of a watercourse. In the event that otter are likely to be impacted by the works, specific mitigation would be developed in consultation with NatureScot. For example, in the event that the onshore Project cannot be sited to avoid potential effects on an otter shelter, works would only be carried out under a NatureScot otter Derogation Licence, with appropriate mitigation and compensation measure implemented to ensure that otter are maintained at a favourable conservation status within the onshore Project area.	Tertiary	Establish within design principles and these measures will also be established within the SHPP. The SHPP will be secured through a condition attached to the PPP. Where appropriate Derogation Licences will be obtained from NatureScot.	All zones
O7	The CEMP will outline how the onshore Project will ensure the suitable implementation and control of the mitigation measures during construction. An outline CEMP (OMP1: Outline CEMP) is provided alongside the Application for PPP.	Tertiary	As per OMP1: Outline CEMP, the final CEMP will be provided at post-consent. The final CEMP will be secured through a condition attached to the PPP.	All zones.
O8	Control of diffuse and point source pollution. Pollution prevention and control measures will be implemented in accordance with the latest legislation and guidance from SEPA. This includes utilisation of best practice sediment management techniques and employment of best practice pollution prevention techniques. The final CEMP will include a Pollution Prevention and Control Plan in accordance with SEPA's Pollution Prevention Guidelines. A Dust and Air Quality Management Plan (DAQMP) will also be produced within the final CEMP.	Tertiary	As per OMP1: Outline CEMP, these measures will be established within the Pollution Prevention and Control Plan and DAQMP which will be appended to the final CEMP. The CEMP will be secured through a condition attached to the PPP. These measures will also be secured through conditions of CAR authorisations, if required.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
O9	Decommissioning, Restoration and Aftercare Plan A Decommissioning, Restoration and Aftercare Plan will be prepared for the onshore Project and agreed with the Planning Authority prior to decommissioning works being undertaken. The plan will include any measures required to protect otter during decommissioning which are likely to be similar to those proposed within the CEMP.	Tertiary	Established within the design principles (secured through CMSs) and the Decommissioning, Restoration and Aftercare Plan which will be secured through a condition attached to the PPP.	All zones
Atlantic Salmon				
AS1	Protect salmonid river entry by avoiding works within tidal river reaches from April to November (See Seasonal Sensitivity Tables (SSTs) (Tables 9-10 and 9-11) presented within chapter 9: Freshwater ecology, Onshore EIA Report).	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	Landfall zone
AS2	Protect salmonid spawning and incubation through no in-channel working between October to May where appropriate. (See SSTs (Tables 9-10 and 9-11) presented within chapter 9: Freshwater ecology, Onshore EIA Report).	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP	All zones
AS3	Sustain passage of fish through site during works at water course crossing locations where appropriate. (See SSTSs (Tables 9-10 and 9-11) presented within chapter 9: Freshwater ecology, Onshore EIA Report).	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	Cable zone

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
AS4	No post-construction channel barriers will be left/put in place.	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	All zones
AS5	Prevent fish mortality with rescues at all working areas within channels where appropriate.	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	All zones
AS6	Cables to be drilled / buried at sufficient depth to shield electrosensitive species from the potential impacts of EMFs and to prevent channel alteration, or exposure, during a channel-forming event, e.g., storm event.	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	Cable zone
AS7	The use of temporary bridges / spanning bridges rather than pipework will be used in watercourses where appropriate for the haul roads to reduce potential impacts to migrating fish.	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
AS8	Where riverbed or riverbank has been subject to construction, full reinstatement will be delivered.	Primary	Established through design principles (secured through CMSs and CAR licensing). These measures will also be established within the Aquatic Monitoring Plan which will be secured through a condition attached to the PPP.	All zones
AS9	Ensure appropriately qualified ECoW presence at sensitive locations and/or sensitive periods where appropriate.	Primary	The requirement for an ECoW will be secured through CAR licensing and PPP conditions. The Aquatic Monitoring Plan will outline the requirement for an ECoW which will be secured through a condition attached to the PPP.	All zones
AS10	The CEMP will outline how the onshore Project will ensure the suitable implementation and control of the mitigation measures during construction. An outline CEMP (OMP1: Outline CEMP) is provided alongside the Application for PPP.	Tertiary	As per OMP1: Outline CEMP, the final CEMP will be provided at post-consent. The final CEMP will be secured through a condition attached to the PPP.	All zones
AS11	A Pollution Prevention and Control Plan will be established for the onshore Project. Pollution prevention and control measures will be implemented in accordance with the latest legislation and guidance from SEPA such as WAT-SG-745 (SEPA, 2021b) and GPP 22 (SEPA, 2018). The plan will also include utilisation of best practice sediment management techniques and employment of best practice pollution prevention techniques for dealing with groundwater, surface water and soil pollution risk.	Tertiary	As per OMP1: Outline CEMP, these measures will be established within the Pollution Prevention Control Plan which will be appended to the CEMP. The CEMP will be secured through a condition attached to the PPP. These measures will also be secured through conditions of CAR authorisations, if required.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
AS12	Create and implement an Aquatic Monitoring Plan, including controls, to quantify a baseline ecological standard.	Tertiary	Established through design principles (secured through CMSs and CAR licensing). The Aquatic Monitoring Plan will be secured through a condition attached to the PPP.	All zones
AS13	A Decommissioning, Restoration and Aftercare Plan will be prepared for the onshore Project and agreed with THC prior to decommissioning works being undertaken. The plan will include any measures required to protect ecological features during decommissioning which are likely to be similar to those proposed within the CEMP.	Tertiary	Established within the design principles (secured through CMSs) and the Decommissioning, Restoration and Aftercare Plan which will be secured through a condition attached to the PPP.	All zones

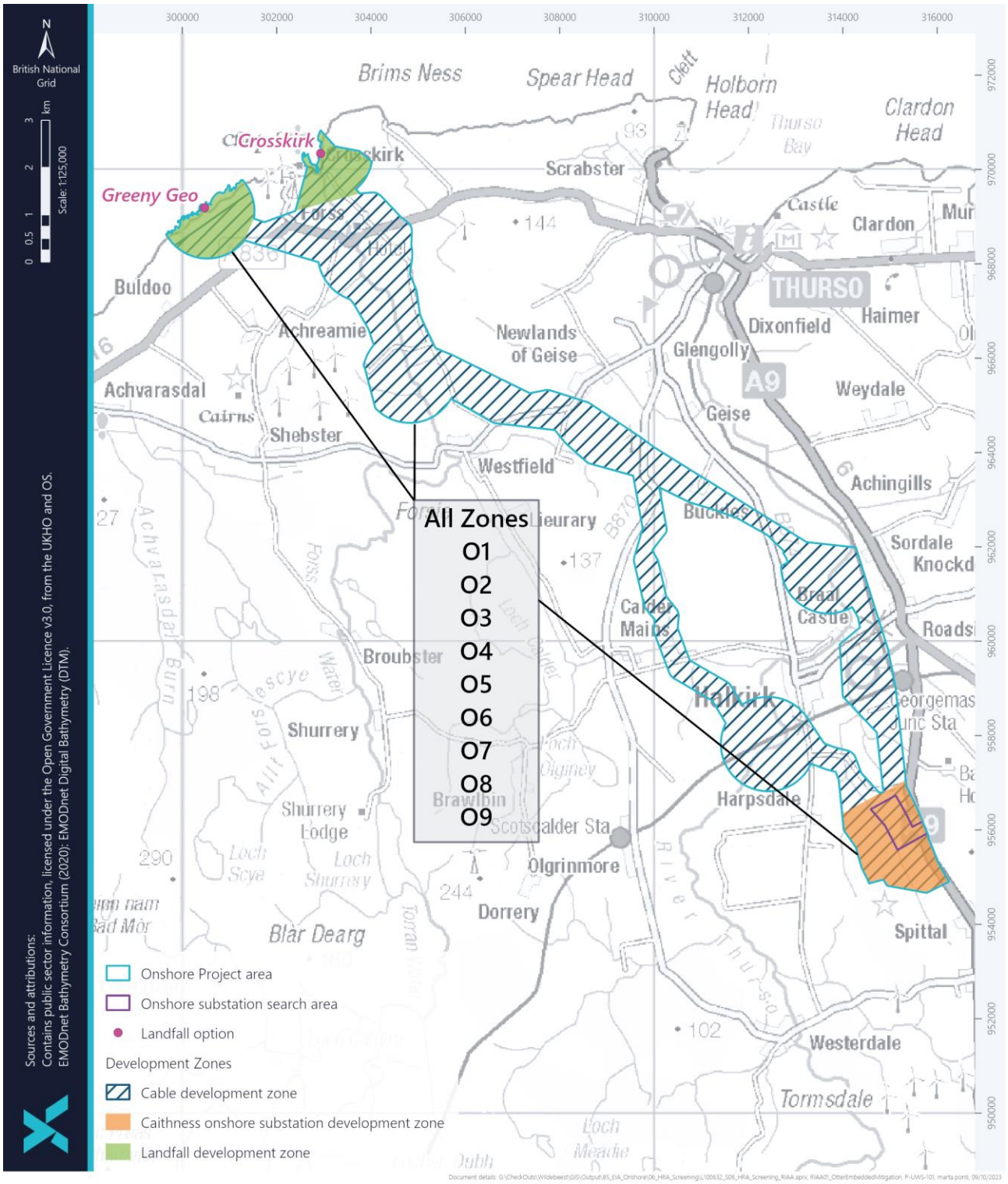

Figure 6-1 Development Zones and embedded mitigation in respect of otter for the onshore PPP Application

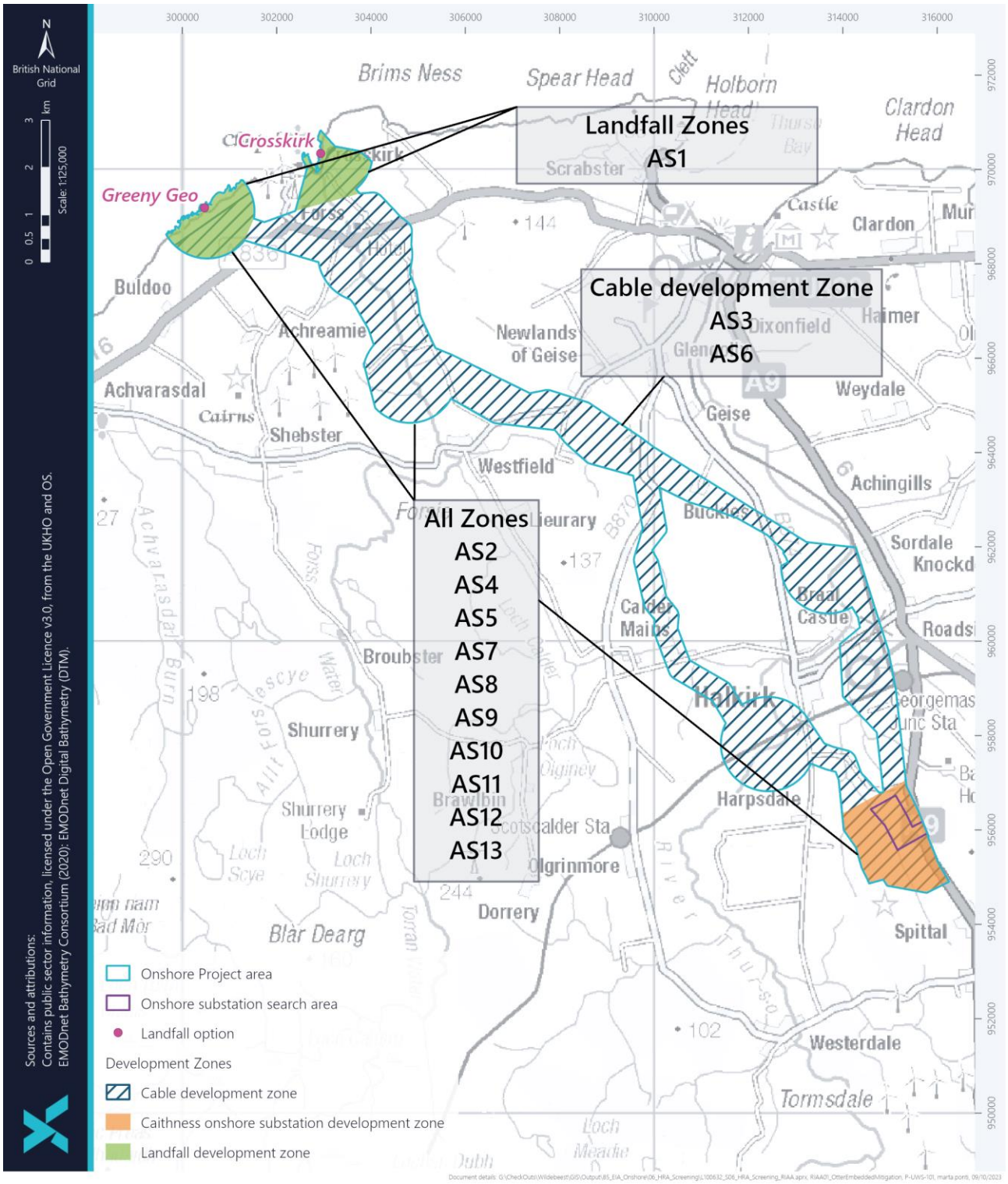

Figure 6-2 Development Zones and embedded mitigation in respect of Atlantic salmon for the onshore PPP Application

6.5 Approach to assessment

6.5.1 Otter

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 accordance with chapter: 10: Non-avian ecology of the Onshore EIA Report, 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 Project. The assessment takes into account records of otter within 2 km of the onshore Project area, evidence of otter activity within the onshore Project area and the suitability of the habitats present for this species.

The levels of otter activity within the onshore Project area were determined during the protected mammal surveys, undertaken as part of the extended Phase 1 habitat survey visits carried out between May and July 2022. The onshore study area, comprising the onshore Project area and a 250 m buffer area, were searched for field signs of otter including spraint, holts, couches, slides, feeding signs and footprints. Survey methodology followed relevant best practice guidelines (Bang & Dahlstrøm (2006), Chanin (2003) and Scottish Natural Heritage (2002)). 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 Project area plus a 2 km buffer.

The methodology for assessing impacts is as per the Onshore EIA Report, chapter 10: Non-avian terrestrial ecology.

6.5.1.1 Survey findings

The field surveys identified evidence of otter activity along named watercourses and drains throughout the onshore study area, with higher levels of activity recorded along the River Thurso and Forss Water and no evidence of activity at the onshore substation search area. Evidence of otter activity included spraint sites, paths, slides and couches, with two holts located within the onshore Project area along Forss Water.

The highest quality habitat for otter was assessed to be along the River Thurso and Forss Water. Habitats of moderate suitability included tributaries of the River Thurso and Forss Water, whilst habitats of a lower suitability included field drains. Although it is expected that otter more frequently utilise the higher suitability habitats, it is expected otter could utilise any riparian areas within the onshore Project area; as indicated by the baseline survey results.

Figure 6-3 and Figure 6-4 show the location and nature of the evidence of otter activity identified within the onshore study area.

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 Project upon the SAC and qualifying otter features of interests. Full details of the survey methodology and results can be found in SS 6: Non-Avian Ecology Technical Survey Report.

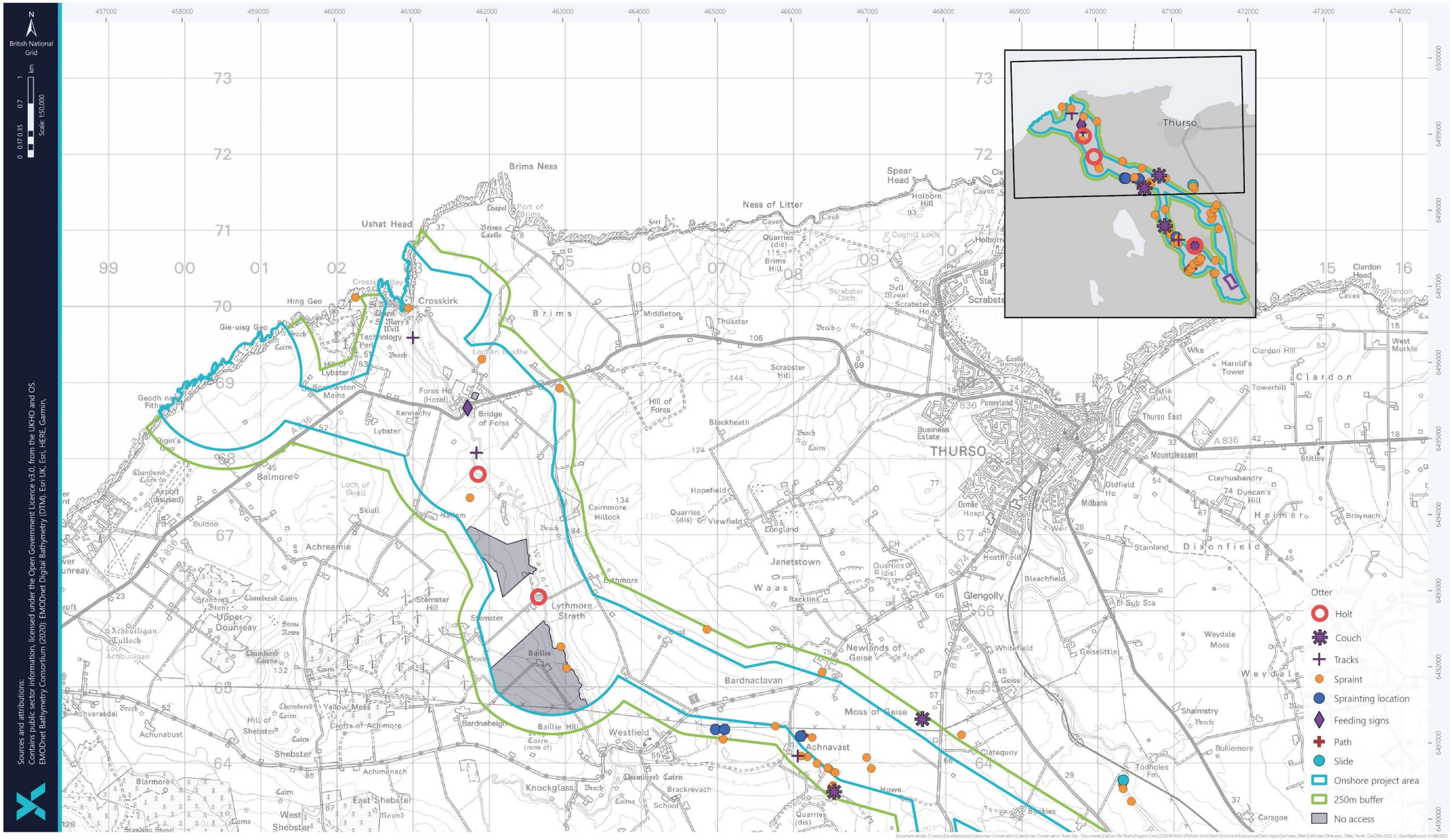

Figure 6-3 Evidence of otter activity within the northern section of the onshore study area

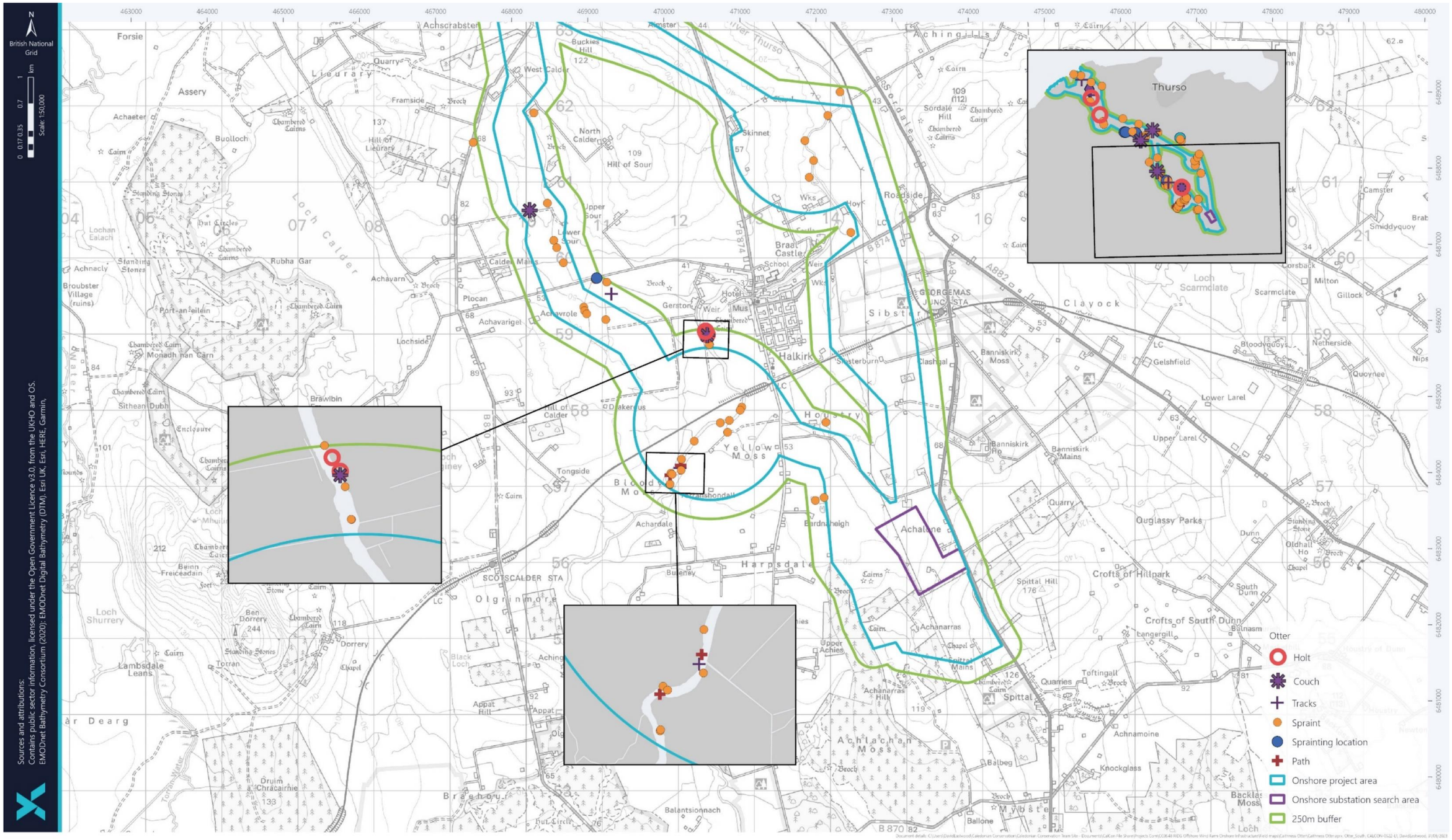

Figure 6-4 Evidence of otter activity within the southern section of the onshore study area

6.5.2 Atlantic salmon

When considering the potential effects of a project on Atlantic salmon 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 accordance with chapter: 9: Freshwater ecology of the Onshore EIA Report, an initial approach is adopted which considers the River Thurso SAC where there is a potential impact pathway between the qualifying interest (i.e., Atlantic salmon) and the onshore Project. The assessment takes into account records of Atlantic salmon within the onshore Project area and the suitability of the habitats present for this species both within the River Thurso and its tributaries.

Fish habitat walkovers were undertaken within the onshore Project area and a 250 m buffer area. A Habitat-Based Approach (HBA) was used to provide a time-invariant description of the potential for channels to host Atlantic salmon indicated by the presence of key, discrete habitat elements linked to their specific life-history stages. It precludes the requirement for a direct survey. The reason for this is that the presence and distribution of fish species, which often migrate between fresh and saline environments (diadromy) are often subject to inter-annual variation at multiple spatial scales (river reach to oceanic basins). Therefore, the absence of these fish in a given year does not guarantee their absence in successive years. However, the absence of suitable habitat (e.g., accumulations of mobile coarse substrates for spawning) does limit their distribution across the medium temporal scale. The findings of the survey were recorded and presented on ArcGIS Pro mapping. A desk based study was also undertaken to assess available information on the presence of Atlantic salmon in the area or other factors, such as, obstacles and the Water Framework Directive (WFD) Status Classifications. Full details of the survey methodology and results can be found in SS4: Freshwater Ecology Technical Survey Report.

The subsequent SAC-specific assessment included an evaluation of the River Thurso SAC conservation objectives and the potential adverse effects of the onshore Project upon the SAC and its qualifying interests.

The methodology for assessing impacts is as per the Onshore EIA Report, chapter 9: Freshwater ecology.

6.6 Caithness and Sutherland Peatlands SAC and Ramsar site

6.6.1 Site details and qualifying interests

The Caithness and Sutherland Peatlands SAC was first classified in January 1996 and is located 5.4 km south-west from the onshore Project area. The 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, 2022).

Following a consultation response from NatureScot (THC, 2023) on the Onshore HRA Screening Report (OWPL, 2023a), the only qualifying feature of the Caithness and Sutherland Peatlands SAC and Ramsar site which has been screened into this RIAA is otter. The feature condition and broader conservation status of this qualifying interest are summarised in Table 6-6.

Table 6-6 Qualifying interests and conditions of the Caithness and Sutherland Peatlands SAC

QUALIFYING INTEREST	FEATURE CONDITION	ASSESSMENT DATE	BROADER CONSERVATION STATUS
Otter	Unfavourable Declining	9th September 2011	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. In Europe, populations declined sharply during the 1960s and 1970s due to pollution. This decline was exacerbated by hunting and habitat loss. Currently, otter is scarce to extinct over most of continental western Europe, whilst it has a discontinuous distribution over eastern Europe, with strong populations in Greece, Spain and Portugal.

6.6.2 Conservation objectives for otter in the Caithness and Sutherland Peatlands SAC

Otter, a qualifying feature of the Caithness and Sutherland Peatlands SAC[7], are currently assessed as 'unfavourable declining' (NatureScot, 2022).

The conservation objective is considered to be met if the conditions for the species' long-term existence are in place (NatureScot, 2020a). These include:

- Avoiding effects that could lead to a permanent reduction in the otter population through mortality, injury, or impacts caused by disturbance or displacement. This includes for example the effects caused by development, river engineering, water pollution, roads without adequate crossing provision for otters or suitable culverts, or entanglement in fishing gear;
- Maintaining the species' ability to use areas of importance within the site;
- Maintaining access to, and availability of, undisturbed resting places; and
- Maintaining access to, and availability of, supporting habitats and prey.

Predicted impacts from the onshore Project alone and in-combination have the potential to affect the conservation objective to ensure the population of otter, as a viable component of the site, in the long term.

[7]*The Caithness and Sutherland Peatlands SAC is also a Ramsar site. Ramsar sites do not have specific conservation objectives and as discussed in section 3.1, are not considered separately if they overlap with SACs and/or SPAs.*

6.6.3 Assessment of adverse effects from the onshore Project alone

6.6.3.1 Construction and decommissioning impacts

6.6.3.1.1 Direct loss or fragmentation of suitable otter foraging and commuting habitat due to land-take

The construction of the onshore Project will result in the direct loss or fragmentation of suitable otter foraging and commuting habitat due to land-take. Whilst the majority of the habitats will be reinstated after the installation of the onshore export cables, as per the embedded mitigation measures set out in Table 6-5, small areas will be permanently lost. The largest of these comprises 6.25 ha of heavily grazed pasture grassland at the onshore substation. However, these modified grassland habitats are suboptimal for otter foraging or shelter, and no evidence of otter activity was recorded in the vicinity of the onshore substation during site surveys (as shown Figure 6-4).

Works may also result in the temporary severance of otter foraging and commuting habitats. However, due to the temporary and short-term nature of the construction activities, and the fact that watercourse crossings (including smaller tributaries) and the impact of these crossings will be minimised through appropriate methods of work, such as HDD or other trenchless methods, where possible, any impacts will be transient in nature. Given the embedded mitigation measures detailed in Table 6-5, the potential impact of direct loss or fragmentation of suitable otter foraging and commuting habitat during the construction and decommissioning of the Project upon otter is not expected to cause an adverse effect on site integrity.

Should the cables need to be removed during decommissioning, the worst case scenario will be the same as for construction. Therefore, the impact of this stage of the works upon otter is also considered to be of negligible magnitude, with no significant adverse effect predicted.

Given the above and the transient nature of the onshore Project upon suitable otter foraging and commuting habitat due to land-take during construction and decommissioning, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.1.2 Potential for direct loss, damage or disturbance to otter holts during works

Surveys identified evidence of otter activity along named watercourses and drains throughout the onshore study area, with higher levels of activity recorded along the River Thurso and Forss Water. Four holts were identified, two of which were located within the onshore Project area, as shown in Figure 6-3 and Figure 6-4.

In the absence of appropriate mitigation, construction activities could result in the direct loss, damage or disturbance of these protected structures. However, the embedded mitigation measures, including the use of HDD or other trenchless techniques at watercourse crossings (as well as others detailed in Table 6-5), will reduce the likelihood of any impacts during construction and decommissioning, with appropriate methods of works are followed and exclusion zones (up to 200 m) implemented around any holts and shelters, where possible. These measures will be detailed within the SHPP and will be overseen by an appropriately qualified ECoW. Any loss, damage or disturbance of protected sites will only be undertaken under a NatureScot otter derogation licence, with appropriate mitigation and compensation measures implemented to ensure that otter populations are maintained at a favourable conservation status.

Given the implementation of the embedded mitigation measures detailed in Table 6-5, in the unlikely worst case scenario where a single otter shelter is affected, any impacts upon otter are considered to be of low magnitude. However, it is more likely that no otter shelters will be affected. Should the onshore export cables need to be removed during decommissioning, the worst case scenario will be the same as for construction.

Given the above, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.1.3 Potential for direct injury or mortality to otter through the movement of plant and other site vehicles through the site and due to deep excavations and uncapped piping

The presence of otter within the onshore Project area has been confirmed, with holts, couch sites, paths, tracks and feeding signs identified during the survey visits, as shown in Figure 6-3 and Figure 6-4. Therefore, in the absence of appropriate mitigation, there is the potential for works to result in direct injury or mortality to otter through the movement of plant and other site vehicles, or as a result of otter becoming trapped within excavations or uncapped piping. However, the implementation of the embedded mitigation measures detailed in Table 6-5including specific measures recommended within the SHPP, will reduce this impact to that of a negligible magnitude, with no significant adverse effects upon otter predicted.

Should the cables need to be removed during decommissioning, the worst case scenario will be the same as for construction, with the exception that the habitat will be restored.

Given the above and implementation of the embedded mitigation measures detailed in Table 6-5, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.1.4 Direct disturbance to commuting or foraging otter

There is the potential for direct disturbance to commuting or foraging otter as a result of construction activities causing vibration, noise and lighting disturbance. However, the implementation of the embedded mitigation listed in Table 6-5 including appropriate methods of work and exclusion zones as required, will reduce this impact to that of a negligible magnitude, with no significant adverse effects upon commuting or foraging otter predicted.

Should the cables need to be removed during decommissioning, the worst case scenario will be the same as for construction, with the exception that the habitat will be restored.

Given the above and the implementation of the embedded mitigation measures detailed in Table 6-5, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.1.5 Indirect impacts to otter and their foraging and commuting habitats

Accidental release (including silt, concrete leachate, fuel and dust) could impact water quality, with potential indirect effects upon otter due to a reduction in the availability and quality of fish prey species. However, the implementation of pollution prevention control measures (as outlined in OMP1: Outline CEMP), including following SEPA's Pollution Prevention Guidelines, will reduce the risk of accidental release. In the unlikely case that an accidental release occurs, this will be managed through the application of appropriate emergency procedures to ensure that any resulting impact is small-scale and temporary.

Such measures will include the use of SuDS such as settlement ponds, swales, filter strips, check dams / berms, sumps and silt fences / straw bales and the use of oil separators, or provision of a self-contained drainage network for areas of potential spills and leaks, as detailed in the outline Drainage Strategy presented in SS3: Flood Risk and Drainage Assessment.

Given the embedded mitigation measures proposed, any indirect impacts to otter and their foraging and commuting habitats during construction will be of a negligible magnitude, with no adverse effects predicted.

Should the cables need to be removed during decommissioning, the worst case scenario will be the same as for construction, with the exception that the habitat will be restored. Therefore, any indirect impacts of the decommissioning work upon otter are also expected to of a negligible magnitude, with no adverse effects predicted.

Given the above, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.2 Operation and maintenance impacts

6.6.3.2.1 Direct loss or fragmentation of suitable otter foraging and commuting habitat through operation and maintenance activities

No further habitat loss or fragmentation is predicted during the routine operation and maintenance of the onshore Project. However, during more significant non-routine maintenance works, habitat loss as a result of excavation to assess and repair any faults along the onshore export cable may occur.

The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. While it is difficult to determine the precise effects on otter due to the unpredictable nature of the requirement for non-routine maintenance works, it is expected that such activities would be infrequent and small scale, resulting in disturbance effects of a lower magnitude than those during construction.

Given the above and with the implementation of the embedded mitigation listed in Table 6-5, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.2.2 Potential for direct loss, damage or disturbance to otter holts during operation and maintenance works

Due to the unpredictable nature of the requirement for maintenance works, it is difficult to determine precise effects on otter. However, during more significant maintenance works; where excavation to assess and repair any faults along the onshore export cable corridor may occur, the potential for direct loss, damage or disturbance to otter holts may be predicted. The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. Works in close proximity to watercourses and any confirmed or potential holt sites are likely to result in a greater impact upon otter. Nevertheless, it is considered likely that the potential for adverse effects to occur during maintenance works is significantly lower than that during construction.

With the implementation of the embedded mitigation listed in Table 6-5, including the need for pre-works surveys prior to any works commencing within 200 m of a watercourse and the use of appropriate exclusion zones if required, any impacts upon otter holts are likely to be of a negligible magnitude, with no adverse effect predicted.

In the unlikely worst case scenario where a single otter holt is affected, the loss or disturbance of the protected site will only be carried out under a NatureScot otter derogation licence, with appropriate mitigation and compensation measures implemented. As such, there will be no adverse effects on the site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.2.3 Potential for direct injury or mortality to otter through the movement of maintenance vehicles through the site during the operation and routine maintenance of the site

It is estimated that there will be a limited amount of traffic to and from the onshore substation for general operation and maintenance purposes (around one vehicle per week unless there are any unexpected faults). As there was no evidence of otter activity in the vicinity of the onshore substation search area, as highlighted in Figure 6-4, and the highest-quality habitats for otter in the onshore Project area (the River Thurso and Forss Water) are over 2 km north-west of the onshore substation search area, the potential for direct injury or mortality to otter from vehicular traffic during the routine operation and maintenance of the onshore substation is low.

During more significant non-routine maintenance works, where excavation to assess and repair any faults along the onshore export cable corridor may occur, more significant impacts upon otter may be predicted. The magnitude of such impacts would be dependent on the scale and location of the works. Works in close proximity to watercourses and any confirmed or potential holt sites are likely to result in a greater impact upon otter, with more potential for direct injury or mortality of otter due to the movement of site vehicles and plant, and the potential for otter to become trapped within deep excavations and uncapped piping. However, it is considered likely that the potential for direct effects to occur during maintenance works is significantly lower than that during construction. Furthermore, with the implementation of the embedded mitigation listed in Table 6-5, including the need for pre-works surveys prior to any works commencing within 200 m of a watercourse, followed by the implementation of appropriate exclusion zones if required, the potential for otter to be injured or killed during the operation and maintenance of the onshore Project is considered to be extremely unlikely.

Given the above, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.2.4 Direct disturbance to commuting or foraging otter

It is estimated that there will be a limited amount of traffic to and from the onshore substation for general operation and maintenance purposes (around one vehicle per week unless there are any unexpected faults). As there was no evidence of otter activity in the vicinity of the onshore substation (as shown in Figure 6-4), and the highest-quality habitats for otter in the onshore Project area (the River Thurso and Forss Water) are over 2 km northwest of the onshore substation, any direct disturbance effects to commuting or foraging otter as a result of the operation and maintenance to the onshore substation is considered unlikely.

The potential for disturbance as a result of visual inspection of the onshore export cables and maintenance works (as required) is likely to be greater than at the onshore substation, particularly for any works in close proximity to watercourses. However, the potential for direct disturbance to commuting or foraging otter is significantly lower than that during construction.

Additionally, as otter are likely to forage or commute through the onshore Project area, they may be more vulnerable to disturbance through additional light pollution during the onshore substation's operational life. However, the use of external lighting around the onshore substation buildings will be intermittent, only used when people are on site. PIR sensor lighting may be provided around the external perimeter of the buildings. Therefore, considering the current levels of lighting and disturbance within the onshore Project area, and the lack of evidence of otter activity in the vicinity of the onshore substation, any disturbance impacts upon otter are likely to of negligible magnitude, with no adverse effects predicted.

Given the above and with the implementation of the embedded mitigation listed in Table 6-5, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.3.2.5 Indirect impacts to otter and their foraging and commuting habitats

Accidental release (including silt, concrete leachate, fuel and dust) could result in a reduction in water quality, with direct effects on the availability and quality of fish prey species. However, the potential for indirect effects to occur during the operation and maintenance of the onshore Project is considered to be significantly lower than that during construction. Furthermore, the implementation of the embedded mitigation listed in Table 6-5 will reduce the risk of accidental release and, in the unlikely case that an accidental release occurs, this will be managed through the application of appropriate emergency procedures to ensure that any resulting impact is temporary, of negligible magnitude, with no adverse effects predicted.

Given the above and with the implementation of the embedded mitigation measures detailed in Table 6-5, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.4 Assessment of adverse in-combination effects

As detailed in section 4.3 above, the following developments listed in Table 6-7 have been screened in for the assessment of in-combination effects. The assessment with the onshore Project in combination with these developments is presented in the following sub-sections.

Table 6-7 Developments screened in for in-combination assessment for Annex II otters

DEVELOPMENT NAME (*PLANNING REF*)	DEVELOPMENT TYPE	STATUS	DISTANCE TO ONSHORE PROJECT AREA (KM)	DATA CONFIDENCE
Forss Wind Farm Extension *(20/04455/FUL)*	Onshore Wind Farm	Application	0.51	Low
Limekiln Extension (20/01905/S36)	Onshore Wind Farm	Consented	5.53	Medium
Corsback Hill Wind Farm (*22/00790/SCO*)	Onshore Wind Farm	Pre-application	6.2	Low

DEVELOPMENT NAME (*PLANNING REF*)	DEVELOPMENT TYPE	STATUS	DISTANCE TO ONSHORE PROJECT AREA (KM)	DATA CONFIDENCE
Loch Toftinghall Wind Farm *(19/02384/SCOP)*	Onshore Wind Farm	Pre-application	3.28	Low
Tormsdale Wind Farm *(21/04984/S36)*	Onshore Wind Farm	Application	4.75	Low
Watten Wind Farm (22/02644/SCOP)	Onshore Wind Farm	Pre-application	5	Low
SHET Dounreay West Substation *(19/01092/FUL)*	Transmission infrastructure – Substation Plant	Consented	2.3	Medium
Pentland Floating Offshore Wind Farm Onshore Substation *(22/04722/PIP)*	Transmission infrastructure – Substation Plant	Consented	2.35	Medium
ESB Asset Development Synchronous Compensator*(20/05118/FUL)*	Transmission infrastructure – Substation Plant	Application	0	Low
High Voltage underground Spittal Synchronous Compensator Grid Connection *(22/00016/FUL)*	Transmission infrastructure - Cables	Consented	0	Medium

6.6.4.1 In-combination construction and decommissioning impacts

6.6.4.1.1 Introduction

Ecology information, including for otter, was available for the following developments: ESB Asset Development Synchronous Compensator (TNEI Services Ltd, 2020), Pentland Floating Offshore Wind Farm Onshore Substation and Onshore Cable (Caledonian Conservation Ltd, 2022), and Construction of new 132kV / 33kV Gas Insulated Switchgear (Scottish and Southern Energy Power Distribution, 2015). None of these identified otter shelters during their associated ecological surveys and no measurable loss of valuable otter foraging habitat was identified. As for this Project, all of these developments are committed to follow equivalent best practice measures.

Although full ecology information is not available for SHET Dounreay West Substation, THC documents indicate that with mitigation in place, no impacts on otters were predicted.

No mention is made of otter in the documents accompanying approval for the other developments.

6.6.4.1.2 Direct loss or fragmentation of suitable otter foraging and commuting habitat due to land-take

The onshore Project is predicted to result in the temporary loss of largely sub-optimal foraging habitat, and permanent loss of a small area (the largest being 6.25 ha of habitat with sub-optimal habitat for otter, located at the onshore substation) which might be used for foraging by otters associated with the Caithness and Sutherland Peatlands SAC.

As embedded mitigations will result in the majority of the habitats impacted being reinstated following the installation of the onshore export cables, such impacts are transient and of negligible magnitude, with no adverse effects predicted. Therefore, any impacts would be extremely small and, if considered cumulatively with other developments in the area where otter have been identified as an important ecological feature, would not result in a measurable increase in potential effects upon this protected species within the local area; assuming the other developments also follow best practice in terms of mitigation.

Consequently, the effect of in-combination construction and decommissioning impacts upon otter and the ecological integrity and conservation status of the Caithness and Sutherland Peatlands SAC as a result of direct fragmentation of suitable otter foraging and commuting habitat due to land-take will result in no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.4.1.3 Potential for direct loss, damage or disturbance to otter holts during works

The onshore Project aims to avoid direct or indirect impacts on otter holts through embedded mitigation measures including pre-works surveys, as required, and with the implementation of appropriate exclusion zones (see Table 6-5). As a result, if considered cumulatively with other developments in the area where otter have been identified as an important ecological feature, there would be no in-combination effect of this nature.

However, in the unlikely event that the onshore Project cannot be sited to avoid the disturbance, modification or destruction of an otter holt, works would only be carried out under a NatureScot otter Derogation Licence, with appropriate mitigation and compensation measures implemented to ensure that otter are maintained at a favourable conservation status within the onshore Project area and wider areas. Assuming other developments also follow best practice and licensing where required, no measurable effect upon the integrity of otter populations at any level, including Caithness and Sutherland Peatlands SAC, is predicted.

Therefore, the effect of the in-combination construction and decommissioning impacts upon otter as a result of direct loss, damage or disturbance to otter holts will result in no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.4.1.4 Potential for direct injury or mortality to otter through the movement of plant and other site vehicles through the site and due to deep excavations and uncapped piping

The onshore Project aims to avoid direct injury or mortality to otter through embedded mitigation listed in Table 6-5, with a negligible magnitude impact predicted and no adverse effect predicted. Therefore, assuming other developments also follow best practice guidance and implement similar mitigation measures where necessary, the effect of in-combination construction and decommissioning impacts as a result of direct injury or mortality to otter will result in no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.4.1.5 Indirect impacts to otter and their foraging and commuting habitats

The onshore Project aims to reduce the potential for indirect impacts to otter and their foraging and commuting habitats through the implementation of the embedded mitigation listed in Table 6-5, with no adverse effects are predicted. Therefore, assuming other developments also follow best practice guidance and implement similar mitigation measures where necessary, no measurable increase in potential effects upon this protected species is predicted. Consequently, the effect of in-combination construction and decommissioning impacts as a result of indirect disturbance to otter will result in no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.4.2 In-combination operation and maintenance impacts

All operation and maintenance impacts of the onshore Project alone have been assessed as being negligible in magnitude, with no adverse effects predicted. Therefore, assuming other developments also follow best practice guidance and implement similar mitigation measures where necessary, no measurable increase in potential effects upon this protected species is predicted. Consequently, the effect of in-combination operation and maintenance impacts as a result of direct disturbance to commuting or foraging otter is will result in no adverse effects on site integrity of the Caithness and Sutherland Peatlands SAC.

6.6.5 Assessment summary and conclusions

The assessment can objectively conclude that there is no adverse effect on site integrity of the Caithness and Peatlands SAC and Ramsar site as outlined in Table 6-8.

Table 6-8 Summary of assessment conclusions

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
Caithness and Peatlands SAC and Ramsar site	Otter	Construction and decommissioning	Direct loss or fragmentation of suitable otter foraging and commuting habitat due to land-take.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential for direct loss, damage or disturbance to otter holts during construction works.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential for direct injury or mortality to otter through the movement of plant and other site vehicles through the site and due to deep excavations and uncapped piping.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
			Direct disturbance to commuting or foraging otter.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Indirect impacts to otter and their foraging and commuting habitats.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
		Operation and maintenance	Direct loss or fragmentation of suitable otter foraging and commuting habitat through operation and maintenance activities.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential for direct loss, damage or disturbance to otter holts during operation and maintenance works.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Direct disturbance to commuting or foraging otter.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			In-direct impacts to otter and their foraging and commuting habitats.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

6.7 River Thurso SAC

6.7.1 Site details and qualifying interests

The River Thurso SAC was first classified as an SAC in March 2005 and overlaps the onshore Project area. The SAC covers 348.25 ha in northern Scotland. Its general site character includes inland water bodies, bogs, marshes, water fringed vegetation, fens, dry grassland, broad-leaved deciduous woodland, inland rocks, screes, sands, permanent snow and ice. It has been designated only for Annex II species; Atlantic salmon. The river supports a higher proportion of multi sea-winter salmon than is found in many rivers further south in the species' range. This is aided by the northerly location of the river and the cooler ambient water temperature, resulting in slower-growing juveniles which smolt at an older age and tend to return as older multi sea-winter salmon. In addition to these multi sea-winter fish, grilse also returns to the River Thurso, meaning that the river supports the full range of salmon life-history types (JNCC, 2005). The condition and broader conservation status of the qualifying interests of the SAC have been summarised in Table 6-9.

Table 6-9 Qualifying interests and conditions of the River Thurso SAC

QUALIFYING INTEREST	FEATURE CONDITION	ASSESSMENT DATE	BROADER CONSERVATION STATUS
Atlantic salmon	Unfavourable Recovering	1st October 2011	The abundance of Atlantic salmon has declined markedly since the 1970s (NASCO, 2019). According to the Atlantic Salmon Trust, wild salmon are in crisis, with a decline of 70% in just 25 years and could become an endangered species in the near future, disappearing from our seas and rivers altogether in just 20 or 30 years (from 2011). The status of Atlantic salmon is still poor in Arctic Water, Greater North Sea, Celtic Seas and Bay of Biscay and Iberian Coast. Its range of distribution has remained stable for the past decade, but abundance and condition are often decreasing (OSPAR, 2022).

6.7.2 Conservation objectives for Atlantic salmon in the River Thurso SAC

The following are the objectives listed for the SAC (NatureScot, 2020b):

- To ensure that the qualifying feature of the River Thurso SAC is in favourable condition and makes an appropriate contribution to achieving favourable conservation status;
- To ensure that the integrity of the River Thurso SAC is restored by meeting the following objectives for Atlantic salmon:
  - Restore the population of Atlantic salmon, including range of genetic types, as a viable component of the site;
  - Restore the distribution of Atlantic salmon throughout the site; and
  - Restore the habitats supporting Atlantic salmon within the site and availability of food.

Temporary impacts on these objectives resulting from plans or projects can only be permitted where they do not prevent the ability of a feature to recover and there is certainty that the feature will be able to recover quickly.

6.7.3 Assessment of adverse effects from the onshore Project alone

6.7.3.1 Construction and decommissioning impacts

6.7.3.1.1 Potential pollution of salmonid habitat from silt, hydrocarbons, fuel, chemicals, concrete leachate and other pollutants either from direct impacts of HDD operations on the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies

Atlantic salmon are dependent on the availability of quality habitats for all parts of their freshwater life history stages, e.g., accumulations of clean, mobile, coarse substrates for spawning, presence of cover from predators, and refuge habitats to avoid extreme climate events, and the provision of food resources for juveniles.

Pollution incidences from construction and decommissioning activities have the potential to result in the mortality of Atlantic salmon at all of their different life history stages, but they are particularly sensitive as juveniles or as eggs within redds where they cannot move away from an incident. Pollutants could also damage habitats used at their different life stages. Adult fish are less susceptible as they are mobile and could use habitats elsewhere; juvenile fish are less mobile and are likely to be more affected. However, there is some tolerance to recover and adapt to small-scale, temporary effects on their habitat. At medium and large spatial scales, the total area of the channel potentially impacted could be minor, and habitats are abundant elsewhere, both within and outside the Project area.

The implementation of embedded mitigation listed in Table 6-5, including avoidance of sensitive periods as per SSTs (Tables 9-10 and 9-11 presented within chapter 9: Freshwater ecology, Onshore EIA Report), employment of an ECoW, adherence to pollution prevention control measures and the development of an Aquatic Monitoring Plan, will all reduce the likelihood of impact by minimising the potential risk of pollution from construction and decommissioning activities. As such the magnitude of impact is assessed as being of low magnitude.

This embedded mitigation will be established within design (through CMSs), and secured within planning conditions and SEPA's CAR licensing, if required. Should an event occur, this can be managed through the application of appropriate emergency procedures to ensure any resulting impact is highly localised and short-term in duration. Emergency procedures for accidental releases will be described within the relevant documentation (e.g. the CEMP will include a Pollution Prevention and Control Plan) secured through post-consent plans and requirements. Both chronic and acute (potential) impacts will also be monitored as appropriate through provisions within the Aquatic Monitoring Plan.

Consequently, the impacts from pollution incidences from construction and decommissioning will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.1.2 Potential direct damage to salmonid habitat from HDD operations that will be used to lay cables under the River Thurso

The use of HDD for installing cables under the River Thurso could damage habitat with the potential to destabilise banks, leading to erosion and changes in hydrodynamics, which could impact habitat availability and quality.

There is also potential for Atlantic salmon to be affected by these impacts through loss of spawning, nursery, shelter, or feeding habitats. However, as older salmonids are mobile, they can avoid temporary disturbances; juvenile fish are less mobile and likely to be more affected. However, there is some tolerance to recover and adapt to small-scale, temporary effects on their habitat. At medium and large spatial scales, the total area of the channel potentially impacted will be minor, and habitats are abundant elsewhere, both within and outside of the Project area.

The implementation of embedded mitigation listed in Table 6-5, specifically avoidance of sensitive periods as per SSTs (Tables 9-10 and 9-11 presented within chapter 9: Freshwater ecology, Onshore EIA Report), burial of cables to sufficient depth to prevent channel alteration or exposure, employment of an ECoW, no post channel barriers and reinstatement of areas to their pre-construction state, and the development and implementation of an Aquatic Monitoring Plan, will reduce the likelihood and minimise the potential risks of HDD activities on salmonid habitat. This embedded mitigation will be established within design (through CMSs) and secured within planning conditions and SEPA's CAR licensing, if required. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, the impacts from damage to salmonid habitat from HDD operations during construction and decommissioning will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.1.3 Potential interruptions to watercourse connectivity and salmonid migration from temporary or permanent structures, chemical barriers, percussive barriers or morphological changes either directly from HDD operations under the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies

Atlantic salmon migrate through a river system for spawning, feeding and refuge purposes. Migrations are not solely the preserve of adults with seasonal (e.g., overwintering), age-dependent and salmonid smolt transitions to the marine environment, demonstrating migration's overwhelming role in native fish ecology. Construction and decommissioning activities could have the potential to affect fish passage, particularly at the most sensitive times of the life stages.

Activities include potential pollution incidences, creating dry working areas in the minor watercourses, installing and removing temporary pipes or structures in the minor watercourses, noise and vibration from HDD activities in the River Thurso, and physical barriers due to permanent structures or morphological changes all have the potential to interrupt migration.

However, the risks can be minimised for Atlantic salmon if works are undertaken at appropriate times of the year. The wide window for certain migrations (e.g., river entry or smolt migration) suggests some resilience to the receptors from temporary barriers. There is, therefore, some tolerance to recover and adapt to temporary impacts to their passage. In addition, it is proposed to use temporary bridges / spanning structures for appropriate locations for haul roads rather than pipework, and just one permanent access track across a minor watercourse is planned which will reduce potential impacts further.

The implementation of embedded mitigation listed in Table 6-5, specifically avoidance of sensitive periods as per SSTs (Tables 9-10 and 9-11 presented within chapter 9: Freshwater ecology, Onshore EIA Report), sustaining passage of fish through site works where appropriate, the use of temporary bridges / spanning bridges, employment of an ECoW, sufficient burial of cables, adherence to pollution prevention controls, no post channel barriers, reinstatement of areas to their pre-construction state, and the development and implementation of an Aquatic Monitoring Plan, will reduce the likelihood and minimise the potential interruptions to fish migration from construction and decommissioning activities. This embedded mitigation will be established within design (through CMSs) and secured within planning conditions and SEPA's CAR licensing, if required. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, impacts to fish migration during construction and decommissioning will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.2 Operation and maintenance impacts

6.7.3.2.1 Potential indirect pollution of salmonid habitat from the operating onshore substation SuDS and sewage treatment system which will discharge into a tributary connected to the River Thurso

There is potential for indirect pollution in the River Thurso SAC, with a risk of fish mortality, damage to habitats and interruptions to fish passage from discharges from the SuDS and sewage treatment systems at the new onshore substation facility should there be a failure in the system. The Burn of Achanarras is adjacent to the onshore substation search area and is a tributary of the River Thurso SAC, which is approximately 2 km away. However, as per the Outline Drainage Strategy presented in SS3: Flood Risk and Drainage Assessment, the surface water drainage network for the onshore substation will be designed taking into account THC's Supplementary Guidance: Flood Risk and Drainage Impact Assessment (THC, 2013), SUDSWP's Water Assessment and Drainage Assessment Guide (SUDSWP, 2016) and CIRIA Publication C753 – the SuDS Manual (CIRIA, 2015). In addition, the septic tank system will meet the discharge standards under a CAR licence from SEPA.

As per OMP1: Outline CEMP and the Outline Drainage Strategy presented in SS3: Flood Risk and Drainage Assessment, the CEMP will include a Pollution Prevention and Control Plan and the final Drainage Strategy which will incorporate these measures to reduce the likelihood and minimise the potential risks of pollution of salmonid habitat. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, impacts from indirect pollution incidents to salmon habitats during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.2.2 Potential pollution or damage to salmonid habitat from maintenance that requires excavation activities, e.g., cable replacement or repair either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies

Maintenance activities that require excavation works, e.g., cable repair or replacement, could lead to pollution incidences or direct damage to riverbanks similar to that identified for the construction and decommissioning stages. These could be directly in the River Thurso or indirectly from maintenance works on/in the vicinity of connecting waterbodies.

These potential impacts could result in the mortality of Atlantic salmon and potentially affect their spawning, nursery, shelter, or feeding habitats. Older salmonids are mobile and can avoid temporary disturbances; juvenile fish are less mobile and likely to be more affected.

However, routine maintenance works during the operation phase are likely to be infrequent, localised and small-scale. The implementation of embedded mitigation listed in Table 6-5, including avoidance of sensitive periods as per SSTs (Tables 9-10 and 9-11 presented within chapter 9: Freshwater ecology, Onshore EIA Report), employment of an ECoW, sufficient burial depth of cables, adherence to pollution prevention control measures, reinstatement of areas, and the development of an Aquatic Monitoring Plan, will reduce the likelihood of risks of pollution or damage to salmonid habitat from potential excavation activities during the operation and maintenance stage. The embedded mitigation will be established within design (through CMSs) and secured within planning conditions and SEPA's CAR licensing, if required. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, impacts of indirect pollution incidents to salmon habitats during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.2.3 Potential indirect longer-term consequences of HDD on riverbank stability, channel morphology and flow regime

HDD could result in longer-term destabilisation of the riverbanks if a problem occurs post-reinstatement. This could result in changes to channel morphology and flow regime, which could affect the quality and availability of habitats for the different life history stages of salmon. These impacts may evolve slowly over time, taking a number of years to become evident.

The implementation of embedded mitigation listed in Table 6-5 to be applied during construction, including sufficient burial depth of cables, no post channel barriers, reinstatement of areas to their pre-construction state, and the development and implementation of an Aquatic Monitoring Plan, will reduce the likelihood and minimise the potential risks in the longer term. This embedded mitigation will be established within design (through CMSs) and secured within planning conditions and SEPA's CAR licensing, if required. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, impacts from longer-term consequences on habitat quality and availability during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.2.4 Potential direct disturbance to sensitive species from the EMF under the River Thurso and at connecting watercourses

EMF can affect electrosensitive species such as Atlantic salmon and can act as a barrier to migration if not buried at sufficient depth to shield them. In addition, if not buried sufficiently, channel alteration or cable exposure during a channel-forming or avulsion event, e.g., a storm event, could occur. This could result in the loss of spawning, nursery, shelter, or feeding habitats.

These impacts will be considered during design, and the cable installation will follow best practice protocols and requirements under SEPA's CAR licensing to minimise impacts to the River Thurso and connecting waterbodies. It is proposed that for minor watercourse and ditch crossings that connect with the River Thurso, the burial depth will be between 1.0 m to 1.8 m. The burial depth for the River Thurso using HDD technique may exceed a depth of 1.8 m.

The implementation of the of embedded mitigation listed in Table 6-5 to be applied during construction, specifically, cables will be buried at sufficient depth to shield electrosensitive species from the potential impacts of EMF, no post channel barriers will be in place, reinstatement of areas to their pre-construction state and development and implementation of an Aquatic Monitoring Plan, will reduce the likelihood and minimise the potential risks in the longer-term. This embedded mitigation will be established within design (through CMSs) and secured within planning conditions and SEPA's CAR licensing, if required. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, impacts of EMF during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.3.2.5 Potential interruptions to watercourse connectivity and salmonid migration from permanent structures, chemical barriers, or morphological changes either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies

Potential interruptions to fish passage could occur during the operation and maintenance phase, although there is less potential than during the construction and decommissioning stages.

Maintenance activities that require excavation works, e.g., cable repair or replacement, could lead to pollution incidences (chemical barrier) or direct damage to riverbanks similar to that identified for the construction and decommissioning stages. These could be directly in the River Thurso or indirectly from maintenance works on/in the vicinity of connecting waterbodies. These potential impacts could result in interruptions to fish passage and potentially damage their spawning, nursery, shelter, or feeding habitats. Older salmonids are mobile and can avoid temporary disturbances; juvenile fish are less mobile and likely to be more affected.

Fish movement could also be impeded if bank destabilisation occurs post-reinstatement. These impacts may evolve slowly over time, taking a number of years to establish. The creation of any new barrier as a result of morphological changes has the potential to reduce or remove salmon presence from upstream of the barrier. This is more likely on the connecting waterbodies of the River Thurso than directly on the SAC.

Permanent access tracks across watercourses could impede migration depending on the type of crossing installed. Currently, just one of the proposed permanent access tracks will cross a tributary of the River Thurso.

Routine maintenance works during the operation and maintenance phase are likely to be infrequent, localised and small-scale. The implementation of embedded mitigation listed in Table 6-5 during construction, including avoidance of sensitive periods as per SSTs (Tables 9-10 and 9-11 presented within chapter 9: Freshwater ecology, Onshore EIA Report), sustain passage of fish through site during works at crossing locations, use of temporary bridges or spanning bridges, employment of an ECoW, adherence to pollution prevention control measures, no post construction channel barriers, reinstatement of areas to their pre-construction state and the development of an Aquatic Monitoring Plan, will reduce the likelihood of longer-term bank destabilisation and minimise the potential risks to fish passage.

This embedded mitigation will be established within design (through CMSs) and secured within planning conditions and SEPA's CAR licensing, if required. As such the magnitude of impact is assessed as being of low magnitude.

Consequently, impacts on fish migration during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.4 Assessment of adverse in-combination effects

As detailed in section 4.3 above, the following developments listed in Table 6-7 have been screened in for the assessment of in-combination effects. The assessment with the onshore Project in combination with these developments is presented in the following sub-sections.

Table 6-10 Developments screened in for in-combination assessment for Annex II Atlantic salmon

DEVELOPMENT NAME (*PLANNING REF*)	DEVELOPMENT TYPE	STATUS	DISTANCE TO ONSHORE PROJECT AREA (KM)	CONFIDENCE
Tormsdale Wind Farm *(21/04984/S36)*	Onshore Wind Farm	Application	4.75	Low
ESB Asset Development Synchronous Compensator*(20/05118/FUL)*	Transmission infrastructure – Substation Plant	Application	0	Low
High Voltage underground Spittal Synchronous Compensator Grid Connection *(22/00016/FUL)*	Transmission infrastructure – Cables	Consented	0	Medium

Tormsdale Wind Farm comprises the development of a 12 turbine wind farm (maximum blade tip height 149.9 m) with associated infrastructure, including underground cabling, access tracks and an on-site control building. It will be in operation for a period of 30 years. The proposal is located 1.5 km south of the Bridge of Westerdale Halkirk and is adjacent to the River Thurso and within approximately 5 km of the onshore Project area. The development is in application stage, and therefore it is unknown as to whether there would be cumulative construction effects at this point.

The ESB Asset Development Synchronous Compensator proposal involves the erection and operation of a grid stability facility, including a synchronous compensator, ancillary equipment, access, landscaping, drainage, car parking and boundary enclosures. The proposal is immediately adjacent / partially overlaps the onshore substation search area and is within the onshore Project area, and has the potential to impact the Burn of Achanarras and associated ditches. An EIA is not required for this project. It is unknown when construction will commence and whether there will be an in-combination construction effect.

Spittal Synchronous Compensator Grid Connection involves a high voltage underground grid connection for a proposed synchronous compensator outlined in the previous paragraph. The proposal is located within close proximity to the onshore substation search area, located 0.24 km south-west and also within the onshore Project area and has the potential to impact the Burn of Achanarras and associated ditches. This application has been approved, and due to the required start date, time frame and nature of the Project, it is likely to be constructed by March 2026, before the commencement of the onshore Project, and therefore, will be unlikely to have any in-combination construction effects.

6.7.4.1 In-combination construction and decommissioning impacts

It is unclear at this stage as to what extent there could be in-combination impacts associated with construction activities for these three proposals, as the construction timetable is unknown. Based on the available information, no temporal overlap of the construction stages of these developments is expected, and therefore, there is currently no known in-combination impacts associated with construction activities for these proposals. The Tormsdale Wind Farm proposals are expected to be 30 years, and the other two proposals listed are of unknown duration. This means that temporal overlap in decommissioning cannot yet be identified and therefore, there is currently no known in-combination impacts associated with decommissioning activities for these proposals.

6.7.4.2 In-combination operation and maintenance impacts

6.7.4.2.1 Potential indirect pollution of salmonid habitat from the operating onshore substation SuDS and sewage treatment system which will discharge into a tributary connected to the River Thurso

The main cumulative risk from the Spittal Synchronous Compensator and ESB Asset Development proposals stems from the potential to pollute the nearby Burn of Achanarras and its associated ditches, with discharges from the drainage systems required at each site, combined with the new system proposed at the onshore Project's onshore substation. However, similar to the onshore Project, the Spittal Synchronous Compensator and ESB proposals both have identified mitigation and installation of SuDS in accordance with best practice and guidance.

The embedded mitigation in Table 6-5 and implementation of best practices and guidance minimises the likelihood of in-combination effects from the pollution of salmonid habitat.

Consequently, the in-combination impacts from pollution incidents during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.4.2.2 Potential pollution or damage to salmonid habitat from maintenance that requires excavation activities, e.g., cable replacement or repair either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies

At this stage, it is unclear whether excavation activities would be required during the operation and maintenance stage for the three proposals. However, assuming these developments also follow best practice guidance and implement similar mitigation measures to those for this Project as outlined in Table 6-5, no measurable increase in potential effects upon Atlantic salmon is predicted.

Therefore, the in-combination impacts from pollution or damage to salmonoid habitat during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.4.2.3 Potential indirect longer-term consequences of HDD on riverbank stability, channel morphology and flow regime

There is no information relating to the use of HDD within the available documentation for the three projects. In the EIA Report for Tormsdale Wind Farm (Arise, 2023), it is proposed to upgrade the existing River Thurso crossing with a clear span bridge.

Therefore, there are no known in-combination impacts to consider from the longer term consequences of HDD during operation and maintenance.

6.7.4.2.4 Potential direct disturbance to sensitive species from the EMF under the River Thurso and at connecting watercourses

There is no information relating to EMF impacts within the available documentation for the three projects. Therefore, based on best available information, there are no known in-combination impacts to consider from EMF on Atlantic salmon.

6.7.4.2.5 Potential interruptions to watercourse connectivity and salmonid migration from permanent structures, chemical barriers, or morphological changes either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies

There is a low likelihood of effects on fish passage from chemical (pollution) barriers, with the implementation of embedded mitigation, as per Table 6-5, for the onshore Project. Adherence to these measures will ensure no significant adverse effects from the onshore Project. The documentation available for the three projects includes mitigation to minimise potential impacts from pollution.

The embedded mitigation, as per Table 6-5, for the onshore project states that are to be no post-construction channel barriers. The Tormsdale Wind Farm EIA Report states that watercourse crossings should be designed in order to minimise effects of developments on the natural integrity and continuity of watercourses. The Outline CMS for the Spittal Synchronous Compensator Grid Connection describes how the water crossing of the Burn of Achanarras would be reinstated after the laying of cable underneath it. The risks from impacts of permanent structures from these projects are therefore minimised.

The main potential in-combination effect on interruptions to fish passage to consider is morphological changes. Fish movement could be impacted as a result of any problems of post-construction bank reinstatement of the Burn of Achanarras (a tributary of River Thurso) due to OCT cable laying activities of the Spittal Synchronous Compensator proposal. This also applies to Tormsdale Wind Farm should the proposed water crossings impact riverbank stability. This project also proposes to upgrade an existing crossing of the River Thurso with a clear span bridge which would not require any construction activities or structure within the River Thurso watercourse. The Outline CMS for the Spittal Synchronous Compensator proposal (TNEI, 2021) and the embedded mitigation outlined for the Tormsdale project (Arise, 2023) and those identified in Table 6-5 for the onshore Project means that potential risks are minimised.

Therefore, the in-combination impacts from interruptions to watercourse connectivity and salmonid migration during operation and maintenance will result in no adverse effects on site integrity of the River Thurso SAC.

6.7.5 Assessment summary and conclusions

The assessment can objectively conclude that there is no adverse effect on site integrity of the River Thurso SAC as outlined in Table 6-11.

Table 6-11 Summary of assessment conclusions

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
River Thurso SAC	Atlantic salmon	Construction and decommissioning	Potential pollution of salmonid habitat from silt, hydrocarbons, fuel, chemicals, concrete leachate and other pollutants either from direct impacts of HDD operations on the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential direct damage to salmonid habitat from HDD operations that will be used to lay cables under the River Thurso.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential interruptions to watercourse connectivity and salmonid migration from temporary or permanent structures, chemical barriers, percussive barriers or morphological changes either directly from HDD operations under the River Thurso and/or indirect impacts from activities on/in the vicinity of connecting waterbodies.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
		Operation and maintenance	Potential indirect pollution of salmonid habitat from the operating onshore substation SuDS and sewage treatment system which will be discharged into a tributary connected to the River Thurso.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
			Potential pollution or damage to salmonid habitat from maintenance that requires excavation activities, e.g., cable replacement or repair either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential indirect longer-term consequences of HDD on riverbank stability, channel morphology and flow regime.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential direct disturbance to sensitive species from the EMF under the River Thurso and at connecting watercourses.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Potential interruptions to watercourse connectivity and salmonid migration from permanent structures, chemical barriers, or morphological changes either directly on the River Thurso or indirect impacts from activities on/in the vicinity of connecting waterbodies.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

7 EUROPEAN SITES DESIGNATED FOR ORNITHOLOGY FEATURES

7.1 Introduction

This section provides an assessment of the adverse effects from the onshore Project on SPAs and Ramsar sites designated for the conservation of protected bird species which have been screened into the assessment. This section also provides information used to assess adverse effects of the onshore Project on the conservation objectives of the SPAs screened in for assessment.

7.2 Summary of HRA Screening

7.2.1 SPAs and Ramsar sites screened in for assessment

Table 7-1 presents the SPAs and Ramsar sites that have been screened into the assessment, in accordance with feedback obtained in the HRA Screening Response (see section 5).

Ornithology features with potential theoretical connectivity were categorised as:

- Breeding terrestrial birds; and
- Non-breeding terrestrial birds.

No SPA or Ramsar sites designated for bird features physically overlap the onshore Project area.

Table 7-1 List of European sites designated ornithology features considered within this RIAA

SITE NAME	QUALIFYING INTEREST / FEATURES	DISTANCE TO ONSHORE SUBSTATION SEARCH AREA (KM)	DISTANCE TO ONSHORE EXPORT CABLE CORRIDOR (KM)
North Caithness Cliffs SPA	• Peregrine – breeding	12.7	1.4
Caithness Lochs SPA and Ramsar site	• Whooper swan – non-breeding • Greenland white-fronted goose – non-breeding • Greylag goose – non-breeding	4.2	1.6
Caithness and Sutherland Peatlands SPA	• Golden eagle – breeding	6.5	5.4

SITE NAME	QUALIFYING INTEREST / FEATURES	DISTANCE TO ONSHORE SUBSTATION SEARCH AREA (KM)	DISTANCE TO ONSHORE EXPORT CABLE CORRIDOR (KM)
Caithness and Sutherland Peatlands Ramsar site	• Greylag goose – breeding	6.5	5.4

7.2.2 Pathways for LSE screened in

The impact pathways for which potential LSE could not be ruled out during HRA Screening are presented in Table 7-2.

Table 7-2 Impact pathways screened into the RIAA for ornithology features

RECEPTOR	PROJECT STAGE	POTENTIAL PATHWAY
Breeding and non-breeding terrestrial birds	Construction and decommissioning	• Direct disturbance and/or displacement effects (including noise, light or visual disturbance). • Direct habitat loss (temporary or permanent). • Indirect impacts through effects on habitats and/or prey species.
	Operation and maintenance	• Direct habitat loss (permanent). • Direct disturbance due to maintenance / substation operation • Indirect impacts through effects on habitats and/or prey species.

7.2.3 Pathways for LSE screened out

Following the assessment during HRA Screening and receipt of the HRA Screening Response (THC, 2023), and in line with the position that embedded mitigation is not to be included for the purposes of determining the potential of LSE, no potential impact pathways have been screened out of the assessment.

7.3 Design envelope parameters relevant to ornithological features

The worst case scenario for the assessment of no adverse effects on SPA features and site integrity is based on the design option (or combination of options) that represents the greatest potential for change. Confidence can be held that the development of any alternative options within the design parameters will give rise to no effects greater or worse than those assessed in this RIAA. Table 7-3 presents the worst case design parameters for potential impacts on ornithological features during construction, operation and maintenance, and decommissioning stages of the onshore Project.

Table 7-3 Design parameters specific to the ornithological assessment

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
Construction and decommissioning*	
Direct disturbance and/or displacement effects (including noise, light or visual disturbance) **Direct habitat loss (temporary or permanent)**	Construction activity will last up to four years. Landfall • Preparation of the working area at the landfall site to accommodate a maximum of six boreholes (5 including 1 spare), HDD drilling equipment, utilities and welfare facilities with an estimated area of 7,500 m^2; • Storage of excavated materials from the boreholes prior to disposal off-site; and • HDD construction works for the landfall will take up to six months. Onshore export cable corridor • Construction and reinstatement of temporary laydown areas and access roads for trench / HDD works estimated to be every 2 km along the route; • Ditches and small watercourses that are crossed by the onshore Project haul roads will have appropriately sized pipework installed to maintain water conveyance capacity. Such pipework will be removed when the haul roads are removed; • Excavation of trenches and storage of excavated materials estimated to be 162,525 m^3 per trench (five trenches); • Working corridor estimated to be 33 km long and 100 m wide; and • HDD construction works for the onshore export cable will take up to six months. Onshore substation • Maximum substation footprint of 239,200 m^2 (including landscape screening and bunding); and • Preparation of temporary work compound for onshore substation – 62,500 m^2, with maximum excavated material 1,207,000 m^3. Access tracks • Approximately 5 km in length of permanent access tracks. 24% (1.2 km) are existing tracks, 44% (2.21 km) are existing tracks that require improvements and 33% (1.67 km) will be newly installed tracks; • Temporary access tracks (not including haul roads) up to 3,300 m in length at the landfall, the entry and exit points of the HDD points and the onshore substation. Lengths are indicative only; and • Further access roads to haul roads along the cable route will be required but have not been identified at this stage.

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
	Construction traffic • The most intensive traffic is expected to occur between Year 2 Q2 and Year 3 Q2, with the maximum predicted in Q3 of the Year 2 of construction with an average of 632 construction HGV vehicle trips per day, or an average maximum of 53 two-way HGV vehicle movements each hour, based on a 12-hour working day with core working hours of 8 am to 7 pm.
Indirect impacts through effects on habitats and/or prey species	Landfall • Materials used during drilling of bores, e.g., drilling muds and grout; and • Fuel used in plant machinery. Onshore export cable corridor • Fuel used in plant machinery. Onshore substation • Potential for on-site batching of concrete; • SuDS will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and Shunt Reactor bunds will discharge to the surface water drainage system through a bund water control unit; • Appropriate measures will also be employed to intercept run-off from the work site, for example using silt fences, check dams and settlement ponds to reduce the suspended sediment load of the water prior to any potential discharge into watercourses; • Installation of septic tank system and subsequent discharges; and • Fuel used in plant machinery. Further details of the drainage strategy mechanisms are provided in the Outline Drainage Strategy presented within SS3: Flood Risk and Drainage Assessment.
Operation and maintenance	
Direct disturbance due to maintenance / substation operation	Onshore substation The onshore substation will be unmanned. Therefore, there will be a limited amount of traffic (predominantly light-vehicle traffic) to and from the substation for general operation and maintenance purposes. • Bi-weekly visual inspection and replace fault items under warranty; and • Additional plant maintenance quarterly. Onshore export cables; routine maintenance: • Bi-annual visual inspection of CJB / TJB / earth link boxes.

POTENTIAL IMPACT	DESIGN ENVELOPE SCENARIO ASSESSED
	Non-routine maintenance activities • As required following events causing deterioration or damage to areas surrounding cables; and • Reactive maintenance to faults / failure rates of key plant items. Traffic • Estimated traffic volume is around one vehicle per week. Operational noise • The maximum noise level at the onshore substation is 100 dB(A)) noise level 1 m from the main transformer. Lighting • External lighting from 2.2 lux – 150 lux will be used to illuminate the building and external area at the substation. 2.5 lux will be required around the perimeter fencing. There may also be a need for up to 150 lux at areas requiring higher level of illumination.
Direct habitat loss (permanent)	Onshore substation • Post construction, the temporary works will be removed and the ground re-instated. The only permanent structures will be the onshore substation (maximum of 12 buildings / areas predicted), associated hardstanding and permanent access tracks; and • Maximum substation footprint of 239,200 m^2 (including landscape screening and bunding).
Indirect impacts through effects on habitats and/or prey species	• SuDS system will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and shunt reactor bunds will discharge to the surface water drainage system through a bund water control unit; • Appropriate measures will also be employed to intercept run-off from the work site, for example using silt fences, check dams and settlement ponds to reduce the suspended sediment load of the water prior to any potential discharge into watercourses; and • Installation of septic tank system and subsequent discharges. Further details of the drainage strategy mechanisms are provided in the Outline Drainage Strategy presented within SS3: Flood Risk and Drainage Assessment.

In the absence of detailed information regarding decommissioning works, the implications for SPAs designated for ornithological features are considered analogous to or likely less than those of the construction stage. Therefore, the worst case parameters defined for the construction stage also apply to decommissioning.

7.4 Embedded mitigation and management plans relevant to ornithological features

As described in the EIA methodology (Onshore EIA Report, chapter 7: EIA methodology), certain primary embedded mitigation measures have been adopted as part of the Project development process in order to reduce the potential for impacts to the environment. These primary embedded mitigations, relevant to terrestrial ornithology, have been accounted for in the assessment of adverse effects on site integrity and are detailed within Table 7-5 below. Additionally, tertiary embedded mitigation measures that apply specifically to terrestrial ornithology, such as any management plans to be produced at post-consent for the onshore Project, are also described in Table 7-5.

In line with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance (2018), the principal mitigation measure adopted to minimise the impact of the onshore Project on terrestrial ornithology features has been the use of an iterative design process, which has involved consideration of key ecological issues and constraints throughout the design process. As a result, most of the mitigation measures are embedded within the overall design, allowing the opportunity to site onshore infrastructure away from sensitive ecological features such as breeding sites for sensitive species, as possible. Mitigation buffers to avoid disturbance for key geese and swan species considered within this assessment are provided below in Table 7-4, further information is provided in Table 7-5; TO5.

Table 7-4 Species specific mitigation buffers to avoid disturbance – see TO5 in Table 7-5

RECEPTOR	BUFFER DISTANCE	REFERENCE	NOTES
Wintering Greenland white-fronted goose	500 m	Goodship & Furness (2022)	Use of the minimum disturbance distances is considered appropriate as birds will be habituated to a similar level of disturbance as a result of the existing baseline level from agriculture and the energy industry, and there is abundant similar habitat in the local area which may be utilised during any short-term disturbance caused by construction.
Wintering greylag goose	500 m	Goodship & Furness (2022)	Same buffer used for Greenland white-fronted geese for efficient approach to mitigation, exceeding minimum disturbance distance, but is less than maximum disturbance distance. It is considered appropriate to use a disturbance distance less than the maximum, as birds will be habituated to a similar level of disturbance as a result of the existing baseline level from agriculture and the energy industry, and there is abundant similar habitat in the local area which may be utilised during any short-term disturbance caused by construction.

RECEPTOR	BUFFER DISTANCE	REFERENCE	NOTES
Wintering whooper swan	500 m	Goodship & Furness (2022)	Same buffer used for Greenland white-fronted geese for efficient approach to mitigation, exceeding minimum disturbance distance, but is less than maximum disturbance distance. It is considered appropriate to use a disturbance distance less than the maximum, as birds will be habituated to a similar level of disturbance as a result of the existing baseline level from agriculture and the energy industry, and there is abundant similar habitat in the local area which may be utilised during any short-term disturbance caused by construction.
Breeding greylag goose	600 m	Goodship & Furness (2022)	Maximum disturbance distance is considered appropriate due to sensitivity of birds while breeding, and the potential consequences of breeding failure.

In accordance with the onshore PPP Application, the embedded mitigations listed below have been attributed to particular Development Zones within the onshore Project area, these are detailed in Table 7-5 and presented in Figure 7-1.

Table 7-5 Embedded mitigation measures relevant to terrestrial ornithology[8]

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY*)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
TO1	Onshore Project area and avoidance of sensitive areas. The boundary of the onshore Project has been developed to avoid sensitive areas (peatland, more mature woodland areas, designated areas) wherever possible. Where impacts cannot be avoided, these will be minimised.	Primary	Established through design principles (secured through CMSs).	All zones
TO2	Minimising impact on sea cliffs and coastal habitats associated with designated sites or communities of conservation importance by the use of HDD. No devegetation or ground-breaking works are to occur within 50 m of the cliff edge. This will ensure that sensitive coastal habitats, which may be used by wintering seabirds are not adversely affected by the construction, operation or decommissioning works for the onshore Project.	Primary	Established within the design principles (secured through CMSs). These measures will also be established within the SHPP. The SHPP will be secured through a condition attached to the PPP.	Landfall zone
TO3	Return location to pre-construction state (all locations). Once an area is no longer required for construction, it will be re-instated to ensure it can return to its original use for the remainder of the construction period and operational period. 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.	Primary	Established through design principles (secured through CMSs). These measures will also be established within the HMP and within the SHPP. These plans will be secured through conditions attached to the PPP. Landowner agreements.	All zones

[8] *The embedded mitigation within this table is as per onshore EIA Report, chapter 11 – Terrestrial ornithology, therefore some specific references to species are beyond those being assessed in the RIAA, but included here for completeness.*

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY*)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
	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.			
TO4	Return location to pre-construction state (high sensitivity habitats). For high sensitivity habitats (e.g., Annex I habitats and Scottish Biodiversity List (SBL) habitats), particular care should be taken when removing, storing and reinstating the turfs. In addition to ensuring that the turfs are replaced as close to their original location as possible, and as quickly as possible following works in a given area, the turf should be reinstated in their original orientations. Additionally, targeted specific NVC surveys as agreed with NatureScot post-consent will be carried out within a 250 m buffer ahead of construction works to allow for the micrositing of the route to avoid particularly sensitive habitats in the Project area.	Primary	Established through design principles and as outlined within OMP1: Outline Construction Environmental Management Plan, these measures will also be established within the Security Risk Management Plan (SRMP) appended to the CEMP. The CEMP will be secured through a condition attached to the PPP. Additionally, these measures will also be established within the SHPP and the Decommissioning, Restoration and Aftercare Plan. These plans will also be secured through conditions attached to the PPP.	All zones
TO5	To avoid impacts on foraging geese and swans, wherever possible, construction and maintenance activities will not take place within 500 m of feeding locations identified by Project specific surveys and potentially important feeding areas based on NatureScot dataset (Jonathan Swale, pers. comm. (2023)) between September and mid-May. This meets the minimum disturbance distance for Greenland white-fronted geese, and more than the minimum of 200 m for greylag geese and whooper swans (Goodship & Furness, 2022). Where this is not possible, monitoring will be undertaken by a suitably experienced and qualified ECoW searching for Greenland white-fronted geese, greylag geese, or whooper swans within 500 m of active construction activities. If these species are found, they will be observed for signs of disturbance. If birds are observed to be disturbed (i.e., multiple short flights within a small area, or small groups of birds leaving the main skein), all works will stop	Primary	Established through design principles. These measures will also be established within the SHPP. The SHPP will be secured through a condition attached to the PPP.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY*)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
	within 500 m, and will not recommence until the ECoW has confirmed it is safe to do so after these species are no longer within the buffer area. In addition, foraging habitat within important feeding areas will be prioritised for reinstatement so as to ensure any disruption to Greenland white-fronted geese, greylag geese, and whooper swans is as temporary as possible. No construction activities will take place within 500 m of a Greenland white-fronted goose, greylag goose, or whooper swan roost within one hour before and after sunrise, and one hour before and after sunset. This is to avoid impacts on roosting birds. Any foraging Barnacle geese identified will be afforded a 50 m buffer to avoid disturbance.			
TO6	Minimisation of watercourse crossing where possible (i.e., reduce the number of crossings and the impact of each crossing through the implementation of appropriate techniques such as HDD).	Primary	Established within the design principles. These measures will also be established within the SHPP. The SHPP will be secured through a condition attached to the PPP.	All zones
TO7	Ensure appropriately qualified ECoW presence at sensitive locations and/or sensitive periods. The SHPP will include details of a watching brief which will ensure that the correct procedure is followed if a nesting bird is found during devegetation or ground-breaking works. When the ECoW is not present on site, works must stop, and advice should be sought from the ECoW to determine an appropriate approach. This will include implementing a buffer appropriate to the species and ensuring that works do not recommence until the ECoW has confirmed that the young have fledged and left the nest and/or the nest has been abandoned naturally. Where appropriate, this approach should be discussed and agreed with NatureScot prior to works recommencing.	Primary	The requirement for ECoW(s) will be secured through a condition attached to the PPP. The SHPP will also include the requirements for ECoW(s). The SHPP will be secured through a condition attached to the PPP.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY*)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
TO8	The CEMP will outline how the onshore Project will ensure suitable implementation and control of the mitigation measures. An outline CEMP is provided as part of the onshore Application, see OMP1: Outline construction environment management plan. The CEMP will be finalised prior to construction once the final design of the onshore Project is established.	Tertiary	As per OMP1: Outline CEMP, the final CEMP will be provided at post-consent. The CEMP will be secured through a condition attached to the PPP.	All zones
TO9	Control of diffuse pollution and point source pollution. Pollution prevention and control measures will be implemented in accordance with the latest legislation and guidance from the SEPA. This includes utilisation of best practice sediment management techniques and employment of best practice pollution prevention techniques. The final CEMP will include a Pollution Prevention and Control Plan in accordance with SEPA's Pollution Prevention Guidelines (SEPA, 2018). A DAQMP will also be produced within the final CEMP. Pollution prevention and control measures for HDD activities will be included in HDD CMSs with an associated 'Break-out' Contingency Plan' to mitigate impacts.	Tertiary	As per OMP1: Outline CEMP, these measures will be established within the Pollution Prevention Plan and DAQMP which will be appended to the final CEMP. The CEMP will be secured through a condition attached to the PPP.	All zones
TO10	Create and implement a SHPP. The SHPP will include the following measures. Pre-construction surveys for bird species will be undertaken to identify any species making use of the onshore Project area ahead of works. Surveys will include breeding birds and breeding raptors and owls. Pre-construction checks for nesting birds will be undertaken within 24 hours prior to devegetation or ground-breaking works – if nesting birds are found an exclusion zone will be implemented with a buffer appropriate to the species and works will not be able to recommence within the exclusion zone until the ECoW has confirmed that breeding has ended. In addition, monitoring will be undertaken by suitably experienced and qualified ECoW(s) searching for Greenland white-fronted geese or whooper swans within 500 m of active construction activities – this is described in greater detail under TO5.	Tertiary	The SHPP will establish these mitigations. The SHPP will be secured through a condition attached to the PPP.	All zones

ID	MITIGATION MEASURE	FORM (PRIMARY OR TERTIARY*)	HOW MITIGATION WILL BE SECURED	DEVELOPMENT ZONE APPLICABLE
	Recommended buffers to avoid disturbance to breeding geese and swans which have been identified in this assessment are provided in Table 7-4. If species not included in Table 7-4 are identified as breeding, best practice guidance should be followed in establishing an appropriate buffer to avoid disturbance.			
TO11	Engagement with neighbouring developments to allow the monitoring / understanding of the likely cumulative environmental impacts of the works and to take steps to mitigate the impact of these. This includes collaboration on any Biodiversity Net Gain projects.	Tertiary	External communication with the community, landowners and asset owners will be undertaken by the Community Liaison Officer (CLO). The requirement for a CLO will be secured through a condition attached to the PPP. An Outline Biodiversity Enhancement Plan (BEP) has been provided alongside the Application for PPP. The final BEP will be secured through a condition attached to the PPP.	All zones
TO12	Decommissioning, Restoration and Aftercare Plan. A Decommissioning, Restoration and Aftercare Plan will be prepared for the onshore Project and agreed with the THC prior to decommissioning works being undertaken. The plan will include any measures required to protect ecological features during decommissioning which are likely to be similar to those proposed within the CEMP.	Tertiary	Established within the design principles and the Decommissioning, Restoration and Aftercare Plan which will be secured through conditions attached to the PPP.	All zones

**** As per Institute of Environmental Management and Assessment (IEMA) (2015).***

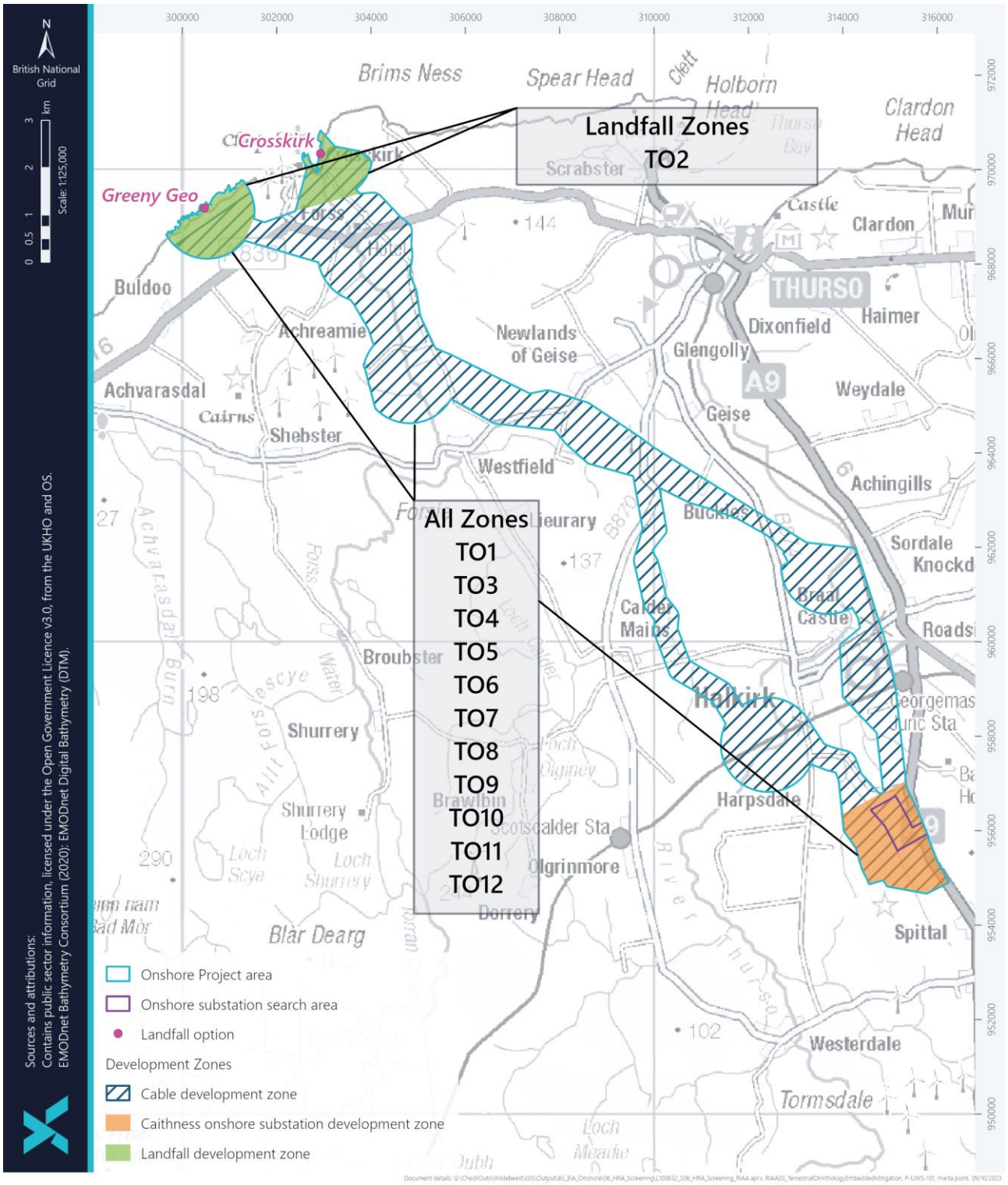

Figure 7-1 Development Zones and embedded mitigation in respect of terrestrial ornithology for the onshore PPP Application

7.5 Approach to assessment

When considering the potential effects of a project on an ornithological species as a qualifying feature of an SPA or Ramsar site, it is important to consider the dispersal distance and foraging range of the species. NatureScot (SNH, 2016) guidance was used to assess connectivity between the onshore Project and SPA / Ramsar sites based on the dispersal and foraging distances of ornithological qualifying features. An initial precautionary ZoI buffer of 20 km surrounding the onshore Project area was used to screen in SPAs and Ramsar sites. This buffer represents the maximum core foraging range of any terrestrial bird species that potentially could be present in the vicinity of the onshore Project area. All designated bird features that were screened into this RIAA (and agreed with NatureScot following a consultation response on the HRA Screening Report - Table 5-1), were those:

- From an SPA / Ramsar site within the 20 km buffer;
- Had a potential pathway for LSE (Table 7-2); and
- Were within theoretical foraging range to the onshore Project area.

The level of bird activity within the onshore Project area was determined during the baseline ornithology surveys undertaken over one year between January 2022 to May 2023 within the onshore study area (including the onshore Project area plus an additional 'buffer area' (see below) encompassing the ZoI over which birds may be affected). The size of the buffer used for the onshore study area depended on the target bird species surveyed, but relevant to the species screened into this RIAA, the onshore study area for breeding raptors and geese used a 2 km buffer and for non-breeding geese and swans, a 3 km buffer was used. Surveys recorded bird locations, dates / flock size, behaviour (flying, foraging, roosting, breeding) and any signs of breeding behaviour. All bird surveys were carried out in line with NatureScot guidance (SNH, 2017). A detailed desk study of the existing literature and data relating to terrestrial ornithology was also undertaken within the onshore Project area plus a 2 km buffer.

The subsequent SPA / Ramsar site-specific assessments (sections 7.6 to 7.8) include an evaluation of conservation objectives and the potential adverse effects of the onshore Project upon each SPA / Ramsar site and its qualifying interests.

Full details of the terrestrial ornithology survey methodology and results which have underpinned this assessment can be found in SS 8: Terrestrial Ornithology Ecology Technical Survey Report. The methodology for assessing impacts is as per the Onshore EIA Report, chapter 11: Terrestrial ornithology.

7.6 North Caithness Cliffs SPA

7.6.1 Site details and qualifying interests

The North Caithness Cliffs SPA was classified on 16th August 1996, with marine extension classified on 25th September 2009, due to its populations of breeding seabirds. The site is a combination of four cliffs on the north coast of Sutherland and one island, Stroma, in the Pentland Firth. The site overlaps either partly or wholly with Duncansby Head SSSI, Stroma SSSI, Dunnet Head SSSI, Holborn Head SSSI and Red Point Coast SSSI. The seaward extension extends approximately 2 km into the marine environment to include the seabed, water column and sea surface.

The onshore Project does not overlap with the North Caithness Cliffs SPA and is 1.4 km away at its closest point.

Following a consultation response from NatureScot (THC, 2023) on the HRA Screening Report (OWPL, 2023a), breeding peregrine, a designated feature of the North Caithness SPA, was screened into this RIAA because this feature has a potential pathway for LSE and is also within foraging range to the onshore Project area.

The feature condition and broader conservation status of this qualifying interest of North Caithness SPA is summarised in Table 7-6.

Table 7-6 Qualifying interests and condition for the North Caithness Cliffs SPA

QUALIFYING INTERESTS	FEATURE CONDITION	ASSESSMENT DATE	BROADER CONSERVATION STATUS (BIRDS OF CONSERVATION CONCERN 5 (STANBURY *ET AL.*, 2021))
Peregrine - breeding	Unfavourable Declining	24th June 2014	Green list

7.6.2 Conservation objectives

The North Caithness Cliffs SPA has a designated population of six pairs of breeding peregrines, representing 0.5% of the Great Britain (GB) population and was selected as one of the most suitable sites for peregrine in GB. The peregrine feature of the North Caithness Cliffs SPA is currently assessed as 'unfavourable declining' (Table 7-6).

The conservation objectives for the North Caithness Cliffs SPA are as follows:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and
- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species as a viable component of the site;
  - Distribution of the species within site;
  - Distribution and extent of habitats supporting the species;
  - Structure, function and supporting processes of habitats supporting the species; and
  - No significant disturbance of the species.

7.6.3 Assessment of adverse in-combination effects

As agreed with NatureScot during pre-application consultation (Table 4-4), the main projects likely to cause similar effects comparable with the onshore Project are those involving large scale development transmission infrastructure, including other wind farms (operational and those under construction, consented or in the planning process).

As detailed in section 4.3 above, the following transmission infrastructure and wind farm developments listed in Table 7-7 have been screened in for the assessment of in-combination effects[9]. The assessment with the onshore Project in combination with these developments is presented in the following sub-sections.

Table 7-7 Developments screened in for in-combination assessment for ornithology features

DEVELOPMENT NAME (*PLANNING REF*)	DEVELOPMENT TYPE	STATUS	DISTANCE TO ONSHORE PROJECT AREA (KM)	DATA CONFIDENCE
Forss Wind Farm Extension *(20/04455/FUL)*	Onshore Wind Farm	Application	0.51	Low
Limekiln Extension (20/01905/S36)	Onshore Wind Farm	Consented	5.53	Medium
Corsback Hill Wind Farm *(22/00790/SCO)*	Onshore Wind Farm	Pre-application	6.2	Low
Loch Toftinghall Wind Farm *(19/02384/SCOP)*	Onshore Wind Farm	Pre-application	3.28	Low
Tormsdale Wind Farm *(21/04984/S36)*	Onshore Wind Farm	Pre-application	4.75	Low
Watten Wind Farm (22/02644/SCOP)	Onshore Wind Farm	Pre-application	5	Low
SHET Dounreay West Substation *(19/01092/FUL)*	Transmission infrastructure – Substation Plant	Consented	2.3	Medium
Pentland Floating Offshore Wind Farm Onshore Substation *(22/04722/PIP)*	Transmission infrastructure – Substation Plant	Consented	2.35	Medium

[9] *For cumulative effects, refer to section 11-7 of the Onshore EIA Report; chapter 11: Terrestrial ornithology.*

DEVELOPMENT NAME (*PLANNING REF*)	DEVELOPMENT TYPE	STATUS	DISTANCE TO ONSHORE PROJECT AREA (KM)	DATA CONFIDENCE
ESB Asset Development Synchronous Compensator*(20/05118/FUL)*	Transmission infrastructure – Substation Plant	Consented	0	Medium
High Voltage underground Spittal Synchronous Compensator Grid Connection *(22/00016/FUL)*	Transmission infrastructure - Cables	Consented	0	Medium

There are no operational or planned onshore wind farm developments that overlap with the onshore Project area. There are two transmission infrastructure developments which are adjacent to the onshore substation search area and potentially could add effects to the in-combination assessment, these developments are the ESB Asset Development Synchronous Compensator and the Spittal Synchronous Compensator Grid Connection (Table 7-7).

The ESB Asset Development Synchronous Compensator Grid Connection involves the erection and operation of a grid stability facility, including a synchronous compensator, ancillary equipment, access, landscaping, drainage, car parking and boundary enclosures. The proposal is immediately adjacent / partially overlaps the onshore substation search area and is within the onshore Project area. Therefore, the proposal has the potential to affect the same SPA qualifying features as those for the onshore Project including directly through disturbance / displacement and habitat loss and indirectly through effects on habitats and/or prey species. However, an EIA was not required for the Synchronous Compensator Grid Connector proposal, and it is unknown when construction will commence and whether there will be cumulative construction effects. Currently, there is no information available from the proposal on impacts to SPA qualifying features to add to an in-combination assessment.

The Spittal Synchronous Compensator Grid Connection involves a high voltage underground grid connection for a proposed synchronous compensator. The proposal is located within close proximity to the onshore Project substation search area, located 0.24 km southwest and also within the onshore Project area. Therefore, the proposal has the potential to affect the same SPA qualifying features as those for the onshore Project. The application for the Spittal Synchronous Compensator Grid Connection has been approved, and due to the required start date, time frame and nature of the development, it is likely to be constructed by March 2026, before the commencement of this onshore Project and therefore will be unlikely to have any cumulative construction effects.

7.6.3.1 In-combination construction, decommissioning, operation and maintenance impacts

7.6.3.1.1 Indirect impacts through effects on habitats and/or prey species

The assessment has concluded no adverse effects on the integrity of the North Caithness Cliffs SPA due to the development of the onshore Project alone, particularly when embedded mitigation is considered. For peregrine, there were no predicted losses or impacts on breeding pairs, negligible loss of habitat and no reduction in foraging opportunities as a result of indirect effects on prey species and so a quantitative in-combination assessment is not possible, nor required.

7.6.4 Assessment of adverse effects from the onshore Project alone

7.6.4.1 Construction and decommissioning impacts

Results from the baseline surveys (presented in the Onshore EIA Report; chapter 11: Terrestrial ornithology) suggest that the onshore Project area is of limited importance for peregrine; this species was not recorded breeding within the 2 km onshore study area and a total of three flights were recorded, only one of which partially overlapped with the onshore Project area. Furthermore, the distance between the boundary of the onshore Project and the North Caithness SPA (1.4 km) is almost twice the maximum disturbance distance recommended for peregrine (750 m, Goodship & Furness, 2022).

Based on this evidence, it is concluded that the onshore Project is beyond the range at which any construction activities could directly affect peregrines within the North Caithness Cliffs SPA. Therefore, impacts of direct disturbance / displacement and direct habitat loss are scoped out of the assessment.

However, the onshore Project is theoretically within the peregrine foraging range (core range of 2 km, (SNH, 2016)) from the North Caithness Cliffs SPA. Therefore, it is considered that the construction and decommissioning stages may potentially have an indirect impact on peregrine through effects on prey species and/or the habitats of prey species, therefore this indirect impact is scoped in to the assessment.

7.6.4.1.1 Indirect impacts through effects on habitats and/or prey species

The HRA Screening Report (OWPL, 2023a) identified that indirect impacts on habitats and/or prey species supporting qualifying features may result from excavation and HDD processes during landfall installations, onshore export cable burial and onshore substation construction works. The reverse processes to remove the onshore export cables and onshore substation in the decommissioning stage may also have similar indirect impacts on habitats and/or prey species.

Construction and decommissioning processes may affect air quality emissions (localised increases in nitrous oxides / particulate matter / dust) which affect prey distribution and abundance or changes in extent and quality of suitable habitat being available within the onshore Project area to foraging terrestrial birds.

Section 6 of the Institute of Air Quality Management (IAQM, 2014) guidance suggests that an 'ecological receptor' may be affected "within 50 m of the boundary of the site; or 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s)".

Changes to surface and ground water levels may also result from construction and decommissioning activities, the extent of changes to water levels are dependent on habitat types.

In relation to the North Caithness Cliffs SPA's conservation objectives, indirect impacts during the construction and decommissioning stages are considered within the context of whether the long-term maintenance of 'distribution and extent of habitats supporting the species' and 'structure, function and supporting processes of habitats supporting the species' can be ensured.

Embedded mitigation (Table 7-5) for the onshore Project includes a commitment to ensure that best practice pollution prevention and control measures are adhered to at all times to minimise the risk of pollutant release into sensitive habitats. Additionally, a DAQMP will be produced for the onshore Project post-consent. This will reduce the risk of indirect effects from air quality related impacts.

Conclusion – Peregrine

One peregrine flight (potentially a foraging bird) was recorded partially overlapping the onshore Project area during baseline surveys; these data indicate that the onshore Project area is infrequently used by foraging peregrine.

Taking into consideration the embedded mitigation, indirect impacts on peregrine are considered to be of negligible magnitude. Due to minimal peregrine foraging activity and with embedded mitigation to minimise pollution and air quality impacts in the onshore Project area, indirect impacts to peregrine via impacts to their prey species or habitats of prey species would be unlikely, and if occurring would be temporary, and relatively limited in spatial extent.

It is therefore unlikely that indirect impacts would result in material effects on survival, productivity or distribution at a population level for peregrine. As such, there will be no adverse effects on site integrity of the North Caithness Cliffs SPA.

7.6.4.2 Operation and maintenance impacts

Results from the baseline surveys suggest that the onshore Project area is of limited importance for peregrine. No habitat used by nesting peregrine will be affected during the operation or maintenance of the onshore Project and given the minimal activity recorded and lack of breeding records within the onshore Project area, the impact of direct habitat loss during the operation and maintenance stage is scoped out of the assessment due to the lack of potential for an adverse effect on the North Caithness Cliffs SPA.

As the onshore Project is theoretically within peregrine foraging range (core range of 2 km, (SNH, 2016)) to the North Caithness Cliffs SPA, it is considered that the operation and maintenance stage may potentially have an indirect impact on peregrine through effects on prey species and/or the habitats of prey species.

7.6.4.2.1 Indirect impacts through effects on habitats and/or prey species

The HRA Screening Report (OWPL, 2023a) identified that indirect effects on habitats and/or prey species supporting qualifying features may result from maintenance activities such as excavation works required for cable repair or replacement during the operation and maintenance stage.

Similar to construction and decommissioning processes, maintenance activities during the operation and maintenance stage may affect air quality emissions and changes to surface and ground water levels.

Indirect impacts during the operation and maintenance stage may compromise the North Caithness Cliffs SPA conservation objectives to ensure the long-term maintenance of 'distribution and extent of habitats supporting the species' and 'structure, function and supporting processes of habitats supporting the species'.

Embedded mitigation (Table 7-5) for the onshore Project includes commitment to ensuring best practice pollution prevention and control measures are adhered to at all times to minimise the risk of pollutant release to sensitive habitats. This also includes the implementation of a DAQMP, which will be produced post-consent.

Conclusion – Peregrine Breeding

The baseline data indicates that the onshore Project area is not an important foraging area for peregrine.

Taking into consideration the embedded mitigation, indirect impacts on peregrine are considered to be of negligible magnitude. Overall, the risk of indirect impacts to peregrine via their prey species and supporting habitats during maintenance work is low, especially with embedded mitigation in place, and if it did occur, would be small-scale and reversible.

It is therefore unlikely that indirect impacts would result in material effects on survival, productivity or distribution at a population level for peregrine. As such, there will be no adverse effects on site integrity of the North Caithness Cliffs SPA.

7.6.5 Assessment summary and conclusions

The assessment can objectively conclude that there is no adverse effect on site integrity of the North Caithness Cliffs SPA as outlined in Table 7-8.

Table 7-8 Summary of results

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
North Caithness Cliffs SPA	Peregrine breeding	- Construction and decommissioning	Indirect impacts through effects on habitats and/or prey species.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and developments.

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
		Operation and Maintenance	Indirect impacts through effects on habitats and/or prey species.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and developments.

7.7 Caithness Lochs SPA and Ramsar Site

7.7.1 Site details and qualifying interests

The Caithness Lochs SPA was initially designated in February 1998 to protect non-breeding Greenland white-fronted goose, the SPA was extended in December 2015 to include the conservation of non-breeding greylag goose and whooper swan. The SPA covers an area of 1,378 ha consisting 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.

Caithness Lochs was also listed as a Ramsar site in February 1998 and the site was extended in October 2000. 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 non-breeding Greenland white-fronted goose, greylag goose and whooper swan.

The SPA and Ramsar site are similar in extent and because impacts are likely to be similar, the assessment of effects on the integrity of the SPA is also applicable to the Ramsar site, unless specifically noted.

The onshore Project does not overlap with the Caithness Lochs SPA / Ramsar site which is located 1.6 km south-west of the onshore Project area at its closest point.

The main vulnerability of the SPA identified in the Natura 2000 citation is changes in biotic and abiotic conditions within the lochs (i.e. changes to the abundance, diversity and interspecific relationships between living organisms as well as changes to the water and soil) as well as wildfowling. Also identified as vulnerabilities are pollution and habitat change / removal due to utility and service lines.

Following a consultation response from NatureScot (THC, 2023) on the HRA Screening Report (OWPL, 2023a), non-breeding Greenland white-fronted goose, greylag goose and whooper swan, all designated features of the Caithness Lochs SPA and Ramsar site, were screened into this RIAA because these features have a potential pathway for LSE and are also within foraging range to the onshore Project area.

The feature condition and broader conservation status of these qualifying interests of the Caithness Lochs SPA / Ramsar site are summarised in Table 7-8.

Table 7-9 Qualifying interests and condition for the Caithness Lochs SPA / Ramsar site

QUALIFYING INTERESTS	FEATURE CONDITION	ASSESSMENT DATE	BROADER CONSERVATION STATUS (BIRDS OF CONSERVATION CONCERN 5 (STANBURY *ET AL.*, 2021))
Greenland white-fronted goose - non-breeding	Favourable Declining	1st April 2016	Red list
Greylag goose - non-breeding	Favourable Maintained	15th November 2015	Amber list
Whooper swan - non-breeding	Favourable Maintained	8th March 2015	Amber list

7.7.2 Conservation objectives

The designated non-breeding populations of Greenland white-fronted goose, greylag goose and whooper swan are presented in Table 7-10.

The Greenland white-fronted goose population has experienced a long-term decline due to chronic low productivity in the Greenland population; small foraging flocks on traditional peatland sites have been lost, coincident with a shift towards managed grasslands (Balmer *et al.*, 2013). The UK and Ireland population was estimated as 20,797 individuals in 2014 (Mitchell *et al.*, 2010; Fox *et al.*, 2014), with the most recent counts from 2020 estimating 21,509 individuals (Fox and Francis, 2020), indicating some recent stability.

The UK greylag goose population appears to be exhibiting a long-term positive trend, with a 27 % increase from 2007/08 to 2017/18 (Burns *et al.* 2020). The whooper swan population also appears to exhibit a long-term positive trend, with numbers increasing (Soriano-Redondo *et al.*, 2023).

Table 7-10 Cited and current populations of qualifying features of Caithness Lochs SPA

QUALIFYING INTERESTS	CITED SPA POPULATION (INDIVIDUALS)	CURRENT SPA POPULATION (INDIVIDUALS)
Greenland white-fronted goose	440 (1993/94-97/98 winter peak mean) representing 3% of GB and 1% of Greenlandic population.	338**
Greylag goose	7,190 (1993/94-1997/98 winter peak mean) representing 7% of the GB and Icelandic populations.	10,119 (winter mean between 2011/12-2014/15)* 10,488**

QUALIFYING INTERESTS	CITED SPA POPULATION (INDIVIDUALS)	CURRENT SPA POPULATION (INDIVIDUALS)
Whooper swan	240 (1993/94-1997/98 winter peak mean) representing 4% of GB and 1% of Icelandic population.	208**

** British Trust Ornithology (BTO) Wetland Bird Survey (WeBS) core count data (Austin et al., 2023).*

*** Based on NatureScot data (Alexander Macdonald, pers. comm. 2023[10])*

The conservation objectives for the Caithness Lochs SPA are as follows[11]:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and
- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species as a viable component of the site;
  - Distribution of the species within site;
  - Distribution and extent of habitats supporting the species;
  - Structure, function and supporting processes of habitats supporting the species; and
  - No significant disturbance of the species.

These conservation objectives are considered in the process of determining adverse effects on integrity of the Caithness Lochs SPA (and by extension, Ramsar site), whereupon evidence is provided to ascertain which, and whether any of the conservation objectives may be compromised due to a predicted impact.

7.7.3 Assessment of adverse effects from the onshore Project alone

7.7.3.1 Construction and decommissioning impacts

Results from the baseline goose and swan surveys carried out fortnightly across the onshore Project area and 3 km buffer between September 2022 and mid-May 2023 (refer to the Onshore EIA Report; chapter 11: Terrestrial ornithology) suggest that the onshore Project area is used by foraging non-breeding Greenland white-fronted goose, greylag goose and whooper swan. Greylag goose was also recorded roosting within the onshore Project area. Foraging and roosting birds were recorded within the onshore Project area and 3 km buffer for all three wildfowl species.

[10] *A. Macdonald. 2023. E-mail correspondence, 10 January.*

[11] *The Caithness Lochs SPA is also a Ramsar site. Ramsar sites do not have specific conservation objectives and as discussed in section 3.1, are not considered separately if they overlap with SACs and/or SPAs.*

The onshore Project area is within foraging range for all three species (core range is 5 to 8 km for Greenland white-fronted goose, 15 to 20 km for greylag goose and <5 km for whooper swan, (SNH, 2016)) from the Caithness Lochs SPA / Ramsar site, therefore, birds recorded within the onshore Project area and 3 km buffer may potentially be designated birds. Based on this information and the results of the baseline surveys, it is considered that the construction and decommissioning stages may potentially impact designated bird features both directly and indirectly. Therefore, impacts of direct disturbance / displacement, direct habitat loss (temporary or permanent) and indirect impacts on goose and swan habitats are scoped in to the assessment.

7.7.3.1.1 Direct disturbance/displacement

The HRA Screening Report (OWPL, 2023a) identified that direct impacts of disturbance and displacement on qualifying features may occur during construction and decommissioning works within the onshore Project area associated with noise emissions, light emissions, visual disturbance, dust generation and/or emissions generation associated with vehicle movements and non-road mobile machinery.

Recent reviews (e.g., Goodship & Furness, 2022, Olsson, 2018) investigating distances at which birds respond to a source of human disturbance have found that there are large variations in responses among geese species, individual populations, seasons, the nature of the disturbance source and current baseline disturbance levels. The current source of disturbance across the onshore Project area is likely to be mainly related to agricultural production and wildfowling, some disturbance at the landfall sites may result from dog walkers and people walking / running.

A distance of 500 m is considered to be the minimum value within the range of estimated disturbance distances for Greenland white-fronted geese, but more than the minimum of 200 m extent for greylag geese and whooper swans (Goodship & Furness, 2022). Other studies have found disturbance effects on geese at distances up to 500 m (see for example, Vickery and Gill, 1999, Jensen *et al*., 2017). Therefore, it is considered that foraging geese and swans may be disturbed within 500 m of construction activities, mainly as a result of increased human activity. In addition, roosting birds may also be displaced from intermittently roosting / resting areas within the onshore Project area during construction.

The impacts of disturbance to geese and swans may extend beyond the construction footprint into surrounding habitat e.g. (Jonathan Swale, pers. comm. 2023), but as the onshore Project area is at least 1.6 km away from the Caithness Lochs SPA / Ramsar site, disturbance to qualifying species located within the boundary of the SPA / Ramsar site is unlikely. However, as the onshore Project area is functionally linked to the SPA / Ramsar site, disturbance / displacement impacts to foraging or roosting birds present within 500 m of construction activities may compromise the Caithness Lochs SPA / Ramsar site conservation objectives to ensure the long-term maintenance of 'distribution of species within the site' and 'no significant disturbance of the species'.

Construction activity associated with the onshore Project would last for up to four years, with HDD works taking place six months for the landfall(s) works and six months for the main cable route crossings. The HDD works may include limited 24 hour / 7 days working programme where required during the HDD works. As a worst case scenario, construction activity may overlap with up to four non-breeding seasons.

Embedded mitigation (Table 7-5) for the onshore Project includes commitment to avoid construction activities between September and mid-May wherever possible within 500 m of important goose and swan foraging areas recognised by NatureScot (Figure 11-17 and Figure 11-21 in the Onshore EIA Report, chapter 11: Terrestrial ornithology, Jonathan Swale, pers. comm. 2023).

Where avoidance of a 500 m disturbance buffer is not possible, monitoring will be undertaken by a suitably experienced and qualified ECoW searching for Greenland white-fronted geese, greylag geese or whooper swans within 500 m of active construction activities. If these species are found, they will be observed for signs of disturbance. If birds are observed to be disturbed (i.e., multiple short flights within a small area, or small groups of birds leaving the main skein), all works will stop within 500 m, and will not recommence until the ECoW has confirmed it is safe to do so after these species are no longer within the buffer area.

Greenland white-fronted goose

A flock (23 to 29 birds) of Greenland white-fronted geese was recorded foraging in a stubble field within the onshore Project area near Forss on two separate days (25th and 29th) in October 2022, it is highly likely that the same flock was recorded on each day (refer to Onshore EIA Report; chapter 11: Terrestrial ornithology). These were the only records of foraging white-fronted goose within the onshore Project area during the baseline surveys. The majority of Greenland white-fronted goose foraging activity was recorded taking place over 2.5 km south of the onshore Project area near Broubster, the largest flock recorded was composed of 110 birds. The largest skein of white-fronted geese recorded (1,304 birds) were European white-fronted geese foraging 250 m north-east of the onshore Project area in March 2023, it is probable this flock was migrating through the area to overwintering sites throughout the UK and Ireland.

No roost site for Greenland white-fronted goose was recorded within the onshore Project area, the closest roost site was identified 410 m north-east of the onshore Project area near Buckies (four roosting birds recorded). No important foraging or roosting sites were identified by NatureScot within the onshore Project area (likely due to crop rotation or other changes to field use). However, NatureScot recognise an important roost site adjacent to the onshore Project area at Westfield, and a potentially suitable foraging habitat within the onshore Project area near Crosskirk which may be used in future (Jonathan Swale, pers. comm. 2023, refer to Figure 11-17, Onshore EIA Report; chapter 11: Terrestrial ornithology).

Greenland white-fronted geese are considered to have a 'high' sensitivity to disturbance, particularly from disturbance associated with wildfowling and disturbance distances for this species are considered to range between 500 to 1,000 m (Goodship & Furness, 2022). It is possible that construction activities within the onshore Project area may displace Greenland white-fronted geese from foraging and roosting sites both within the onshore Project area and surrounding habitats. However, usage of the onshore Project area is relatively low with the majority of foraging activity taking place at a distance beyond where disturbance from construction activity is likely, birds will also be habituated to a similar level of disturbance as a result of the existing baseline level from agriculture and the energy industry, therefore a 500 m buffer surrounding construction activity is considered an appropriate distance to avoid disturbance (Table 7-4).

Greylag goose

Greylag geese were recorded foraging within the onshore Project area, although flock sizes were relatively small (1 to 142 birds, refer to Onshore EIA Report; chapter 11: Terrestrial ornithology). The baseline survey data are supported by Mitchell (2012) data which identified 1 km grid squares potentially suitable for foraging greylag goose within the onshore Project area and overlaps with the onshore substation search area. However, the baseline data shows that majority of greylag geese were recorded foraging outside the onshore Project area, the largest flock (1,505 birds) was recorded 1,300 m north-east of the onshore Project area, near Auchingills.

Three greylag goose roosts were identified within the onshore Project area, consisting of one, nine, and ten roosting birds respectively. An additional 18 greylag goose roosts were recorded during baseline surveys outside of the onshore Project area. The largest roost (1,800 birds) was located 1 km south of the onshore Project area near Harpsdale.

Compared with white-fronted geese, greylag geese are considered to be less sensitive to disturbance and have been assigned a 'medium' sensitivity score with a disturbance distance range of 200 to 600 m (Goodship & Furness, 2022). Construction activities within the onshore Project area may displace greylag geese from foraging and roosting sites both within the onshore Project area and surrounding habitats. However, baseline survey results show that usage of the onshore Project area is relatively low with the majority of foraging and roosting activity taking place at a distance beyond where disturbance from construction activity is likely, birds will also be habituated to a similar level of disturbance as a result of the existing baseline level from agriculture and the energy industry, therefore a 500 m buffer surrounding construction activity is considered an appropriate distance to avoid disturbance (Table 7-4).

Whooper swan

Whooper swans were infrequently recorded foraging within the onshore Project area, flock sizes were relatively small ranging between 1 to 21 birds. Davey *et al.* (2016) consider flocks of over 100 birds to be exceptional in Caithness (although counts of 300 have occurred). The largest flock (290 birds) was recorded over 2.5 km east of the onshore Project area, foraging on stubble near Stemster House – this was the only record exceeding 100 whooper swans. NatureScot recognise there are important foraging areas within the north-eastern sections of the onshore Project area (Jonathan Swale, pers. comm. 2023, refer to Figure 11-21, Onshore EIA Report; chapter 11: Terrestrial ornithology).

Whooper swan did not roost within the onshore Project area during baseline surveys, the closest roost site was identified 500 m north-west of the onshore Project area, between Buckies and Auchingills (five roosting birds recorded). NatureScot have not identified any important roost sites within the onshore Project area (Jonathan Swale, pers. comm. 2023).

Whooper swan have been assessed to have a 'medium' sensitivity score and a disturbance distance range of 200 to 600 m (Goodship & Furness, 2022). It is possible that construction activities within the onshore Project area may displace whooper swans from foraging areas within the onshore Project area and surrounding habitats. However, baseline survey results show that usage of the onshore Project area is relatively low with the majority of foraging activity taking place at a distance beyond where disturbance from construction activity is likely, birds will also be habituated to a similar level of disturbance as a result of the existing baseline level from agriculture and the energy industry, therefore a 500 m buffer surrounding construction activity is considered an appropriate distance to avoid disturbance (Table 7-4).

Conclusion – Greenland white-fronted goose, greylag goose, whooper swan

Any disturbance and displacement effects resulting from construction / decommissioning activities would be short-term, temporary and reversible in nature, lasting only for the duration of the construction / decommissioning activities, with birds expected to return to the area once works have ceased. Furthermore, construction / decommissioning activities would not occur across the whole of the onshore Project area simultaneously or every day, but will be phased and the direct impacts will occur only in the areas where activity is taking place.

Taking into consideration the embedded mitigation as per Table 7-5, direct disturbance / displacement impacts on Greenland white-fronted goose, greylag goose and whooper swan are considered to be of negligible magnitude. Although construction activities may cause some localised, temporary disturbance / displacement to greylag goose as well as potentially to Greenland white-fronted goose and whooper swan, considering that there is abundant suitable grazing and roosting habitat surrounding the onshore Project area as well as the embedded mitigation in place to avoid construction activities within 500 m of foraging and roosting areas (Table 7-4), direct disturbance / displacement impacts to designated features of Caithness Lochs SPA / Ramsar site are predicted to be minimal, temporary and relatively limited in spatial extent.

It is therefore unlikely that direct disturbance / displacement impacts would result in material effects on survival, productivity or distribution at a population level for designated species. As such, there will be no adverse effects on site integrity of the Caithness Lochs SPA. It can also be reasonably concluded that no adverse effects on site integrity of the Caithness Lochs Ramsar site will occur.

7.7.3.1.2 Direct habitat loss (temporary or permanent)

The HRA Screening Report (OWPL, 2023a) identified that that direct habitat loss impacts on functionally linked land for qualifying features (Greenland white-fronted goose, greylag goose and whooper swan) outside of Caithness Lochs SPA / Ramsar site, may occur during the construction and decommissioning stages. Direct habitat loss along the onshore export cable corridor would result in a temporary reduction in the area available for foraging and roosting non-breeding geese and swans.

Usage of habitat within the onshore Project area by Caithness Lochs SPA / Ramsar site qualifying features is species-specific and based on habitat preferences and ecology. The majority of habitat within the onshore Project area is composed of improved grassland which accounts for approximately 1,700 ha of land; almost three-quarters of the total onshore study area (NVC codes MG6 and MG7, refer to Figure 10-3 in the Onshore EIA Report; chapter 10: Terrestrial non-avian ecology). The onshore substation search area is also composed of improved grassland. Although improved grassland is potentially suitable for foraging geese and swans, the baseline surveys showed that that the largest flocks of geese and swans were present outside of the onshore Project area, indicating that there is a preference for habitat types outside of the onshore Project area. A summary of findings, and assessment of potential effects on qualifying features is presented below.

Embedded mitigation (Table 7-5) for the onshore Project includes a commitment to ensure that foraging habitat within important feeding areas for geese and swans in the onshore Project area will be prioritised for reinstatement to ensure any disruption to foraging habitat is as temporary as possible.

Greenland white-fronted goose

Foraging Greenland white-fronted geese were largely absent within the onshore Project area, two flocks (23 to 29 birds) were recorded foraging in a stubble field near Forss on two separate days in October 2022. Foraging activity was not recorded within the onshore substation search area. Within the onshore Project area and 3 km buffer, the majority of Greenland white-fronted geese were noted to be foraging in grazing fields (82%), followed by stubble (12%) and a small number of records on marsh (6%). No Greenland white-fronted goose roosts were recorded within the onshore Project area.

No important foraging or roosting sites were identified by NatureScot within the onshore Project area although a potentially suitable foraging habitat overlapping with the northern boundary of the onshore Project area near Crosskirk is recognised by NatureScot (Jonathan Swale, pers. comm. 2023, refer to Figure 11-17, Onshore EIA Report; chapter 11: Terrestrial ornithology).

The arable land within the onshore Project area appears to be generally unsuitable for foraging Greenland white-fronted geese, usage is relatively low and infrequent compared with habitats beyond the onshore Project area. Direct habitat loss associated with the cable installation route may reduce the amount of habitat available to Greenland white-fronted geese, potentially over four winters, but as this species largely forages outside the onshore Project area, direct habitat loss is considered unlikely to affect the ability of Greenland white-fronted geese to forage or roost successfully through the winter.

Greylag goose

During baseline surveys, foraging greylag geese were recorded in relatively small flocks (1 to 142 birds) within the onshore Project area, but foraging activity was not recorded within the onshore substation search area. The largest flocks were recorded foraging outside of the onshore Project area suggesting that fields outside the onshore Project area offer more suitable habitat to foraging greylag geese. During baseline surveys, greylag geese were most commonly recorded foraged in grazing fields (61%), followed by stubble (37%), and vegetable (16%) fields. Greylag geese also used marsh (0.5%) and lochs (0.5%) as foraging habitat.

Mitchell (2012) data have identified that there is potentially suitable habitat for foraging greylag geese within the onshore Project area. A single 1 km grid square of potentially suitable greylag goose habitat overlaps with the onshore substation search area (Mitchell, 2012).

Three greylag goose roosts were identified within the onshore Project area, consisting of one, nine, and ten roosting birds respectively.

Whilst the arable land within the onshore Project area appears to be suitable for greylag geese, usage is lower compared to arable land surrounding the onshore Project area. Direct habitat loss associated with the onshore export cable installation route may reduce the amount of habitat available to geese, potentially over four winters, but with the species commuting relatively widely, it is considered unlikely to affect the ability of geese to forage or roost successfully through the winter.

Whooper swan

Whooper swan were infrequently recorded foraging within the onshore Project area and flock sizes were relatively small ranging between 1 to 21 birds. The majority of whooper swans were recorded outside of the onshore Project area foraging on marsh (43%) followed by stubble fields (35%), although the largest flocks were found foraging on stubble. Whooper swans were also found to forage in grazing fields (16%) and lochs (6%). NatureScot recognise there are important foraging areas within the north-eastern sections of the onshore Project area (Jonathan Swale, pers. comm. 2023, refer to Figure 11-21, Onshore EIA Report; chapter 11: Terrestrial ornithology).

Whooper swan did not roost within the onshore Project area during baseline surveys and NatureScot confirmed there are no important roost sites within the onshore Project area (Jonathan Swale, pers. comm. 2023).

Although the onshore Project area offers potentially suitable foraging land for whooper swan, usage is relatively low in this area compared with the surrounding arable land. Direct habitat loss associated with the onshore export cable installation route may reduce the amount of habitat available to whooper swan, potentially over four winters, but as suitable foraging habitat is available for this species outside of the onshore Project area, direct habitat loss is considered unlikely to affect the ability of whooper swan to forage or roost successfully through the winter.

Conclusion – Greenland white-fronted goose, greylag goose, whooper swan

No geese or swans were found to use the onshore substation search area, nor is this within an important foraging or roosting area as identified by NatureScot, and habitat is suboptimal for foraging or roosting. Mitchell (2012) data has identified that part of the onshore substation search area may potentially be suitable for foraging greylag goose, but baseline surveys did not record any greylag geese in this area and NVC surveys showed that the onshore substation search area is composed of improved grassland which is commonly available in the surrounding area. Therefore, no permanent direct loss of goose and swan foraging or roosting habitat is predicted.

The construction and decommissioning stages would result in some temporary short-term habitat loss within the onshore export cable corridor which would be reversible in nature; habitats along the onshore export cable route will be reinstated and left to mature once works are complete. This would result in a temporary reduction in the area available for foraging.

Taking into consideration the embedded mitigation (Table 7-5), direct habitat loss impacts on Greenland white-fronted goose, greylag goose and whooper swan are considered to be of negligible magnitude. Considering the above information for Greenland white-fronted goose, greylag goose and whooper swan and after implementing the embedded mitigation measures, any effects on qualifying SPA / Ramsar site species are likely to be minimal, temporary and relatively limited in spatial extent.

It is therefore unlikely that direct habitat loss impacts would result in material effects on survival, productivity or distribution at a population level for designated species. As such, there will be no adverse effects on site integrity of the Caithness Lochs SPA. It can also be reasonably concluded that no adverse effects on site integrity of the Caithness Lochs Ramsar site will occur.

7.7.3.1.3 Indirect impacts through effects on habitats

The HRA Screening Report (OWPL, 2023a) identified that indirect impacts on habitats supporting qualifying features may result from excavation and HDD processes during landfall installations, onshore export cable burial and onshore substation construction works. The reverse processes to remove the onshore export cable and onshore substation in the decommissioning stage may also have indirect impacts on habitats and/or prey species.

During the HDD drilling process there is the potential for the release / breakout of inert drilling fluids which may impact the Forss Water and the River Thurso watercourses within the onshore Project area and in turn result in indirect impacts upon geese and swans due to contamination of wetland habitats.

In relation to the Caithness Lochs SPA/ Ramsar site conservation objectives, indirect impacts during the construction and decommissioning stages are considered within the context of whether the long-term maintenance of 'distribution and extent of habitats supporting the species' and 'structure, function and supporting processes of habitats supporting the species' can be ensured.

As part of the Onshore Project's embedded mitigation (Table 7-5), the HDD will be designed considering the ground conditions to minimise the risk of a breakout where possible. The CEMP will include an HDD CMS and 'Break-out' Contingency Plan which will be prepared in advance of construction and detail the measures to be taken in the event of a drilling fluid breakout.

Greenland white-fronted goose

Greenland white-fronted goose foraging records within the onshore Project area were confined to one field (two flocks, 23 to 29 birds) near Forss. The largest flock (1,304 birds) was recorded foraging 250 m north-east of the onshore Project area.

Impacts on habitats due to pollution occurring as a result of construction and decommissioning activities are assessed to be of negligible magnitude, taking into consideration the embedded mitigation. It therefore follows that indirect impacts on Greenland white-fronted geese would also be unlikely

The onshore Project area appears to be generally unsuitable for foraging white-fronted goose, usage of the habitats in this area is relatively low and infrequent. Therefore, impacts on habitats from pollution are unlikely to affect the availability of Greenland white-fronted goose foraging habitat.

Greylag goose

Greylag geese were recorded foraging in relatively small flocks (1 to 21 birds) within the onshore Project area, the largest flock (1,505 birds) was recorded 1,300 m north-east of the onshore Project area.

Impacts on habitats resulting from pollution caused by construction and decommissioning activities has been assessed to be of negligible magnitude, therefore, indirect impacts on greylag geese are also unlikely.

Whooper swan

Whooper swan foraged infrequently within the onshore Project area in small flock sizes (1 to 21 birds).

The onshore Project area appears to be generally unsuitable for foraging whooper swan, usage is relatively low and infrequent. Impacts on habitats due to pollution are unlikely to affect the availability of whooper swan foraging habitat.

Conclusion – Greenland white-fronted goose, greylag goose, whooper swan

Taking into consideration the embedded mitigation (Table 7-5), indirect impacts on Greenland white-fronted goose, greylag goose and whooper swan are assessed to be of negligible magnitude. Based on the above information presented and considering the limited importance for SPA / Ramsar site qualifying features, indirect impacts would be unlikely, and if occurring would be temporary, and relatively limited in spatial extent.

It is therefore unlikely that indirect impacts would result in material effects on survival, productivity or distribution at a population level for designated species. As such, there will be no adverse effects on site integrity of the Caithness Lochs SPA. It can also be reasonably concluded that no adverse effects on site integrity of the Caithness Lochs Ramsar site will occur.

7.7.3.2 Operation and maintenance impacts

Results from the baseline goose and swan surveys showed that the onshore Project area is used, to a limited extent, by foraging non-breeding Greenland white-fronted goose, greylag goose and whooper swan. Greylag goose was also recorded roosting within the onshore Project Area.

The onshore Project is within foraging range for all three species from the Caithness Lochs SPA / Ramsar site. Based on this information and the results of the baseline surveys, it is considered that the operation and maintenance stage may potentially impact designated bird features both directly and indirectly. Therefore, impacts of direct disturbance/displacement, direct habitat loss (permanent) and indirect impacts on goose and swan habitats are scoped in to the assessment.

7.7.3.2.1 Direct disturbance due to maintenance/substation operation

The HRA Screening Report (OWPL, 2023a) identified that maintenance activities along the onshore substation and/or the onshore export cable may cause direct disturbance / displacement impacts on functionally linked land for qualifying features (Greenland white-fronted goose, greylag goose and whooper swan) outside of Caithness Lochs SPA / Ramsar site during the operation and maintenance stages.

Conclusion – Greenland white-fronted goose, greylag goose, whooper swan

During the operation and maintenance stage, disturbance will be limited and confined to short periods of maintenance works at the onshore substation and/or the onshore export cable corridor – these works are considered to be less than those associated with construction and decommissioning activities.

It is possible that maintenance activities may displace Greenland white-fronted goose, greylag goose and/or whooper swan from foraging or roosting habitat. However, works will be temporary, and reversible in the short-term for any section of the cable route, and there is abundant similar habitat in the local area. In addition, the same mitigation used during the construction period, i.e., avoiding maintenance activity within 500 m of goose and swan foraging and roosting areas between September and mid-May wherever possible, where that is not possible, ECoW monitoring within 500 m of maintenance activities will be employed during maintenance as for construction.

Taking into consideration the embedded mitigation, direct disturbance / displacement impacts on Greenland white-fronted goose, greylag goose and whooper swan are assessed to be of negligible magnitude.

After implementing the embedded mitigation measures (Table 7-5) it is unlikely that direct disturbance / displacement impacts would result in material effects on survival, productivity or distribution at a population level for designated species. As such, there will be no adverse effects on site integrity of the Caithness Lochs SPA It can also be reasonably concluded that no adverse effects on site integrity of the Caithness Lochs Ramsar site will occur.

7.7.3.2.2 Direct habitat loss (permanent)

The HRA Screening Report (OWPL, 2023a) identified that that direct habitat loss impacts on functionally linked land for qualifying features (Greenland white-fronted goose, greylag goose and whooper swan) outside of Caithness Lochs SPA / Ramsar site, may occur during the operation and maintenance stages. Direct habitat loss will be 23.9 ha within the footprint of the onshore substation, which would result in a permanent reduction in the area available for foraging and roosting non-breeding geese and swans.

Conclusion – Greenland white-fronted goose, greylag goose, whooper swan

Direct habitat loss impacts on Greenland white-fronted goose, greylag goose and whooper swan are assessed as being of negligible magnitude. No geese or swans were found to use the onshore substation search area, nor is the onshore substation within an important foraging or roosting area as identified by NatureScot (Jonathan Swale, pers. comm. 2023). Therefore, no permanent direct loss of foraging or roosting habitat is predicted.

It is unlikely that direct habitat loss impacts would result in material effects on survival, productivity or distribution at a population level for each designated species. As such, there will be no adverse effects on site integrity of the Caithness Lochs SPA. It can also be reasonably concluded that no adverse effects on site integrity of the Caithness Lochs Ramsar site will occur.

7.7.3.2.3 Indirect impacts through effects on habitats

The HRA Screening Report (OWPL, 2023a) identified that indirect effects on habitats supporting qualifying features may result from maintenance activities such as excavation works required for cable repair or replacement during the operation and maintenance stage.

In relation to the Caithness Lochs SPA / Ramsar site conservation objectives, indirect impacts during the operation and maintenance stage are considered within the context of whether the long-term maintenance of 'distribution and extent of habitats supporting the species' and 'structure, function and supporting processes of habitats supporting the species' can be ensured.

Embedded mitigation (Table 7-5) for the onshore Project includes commitment to ensuring best practice pollution prevention and control measures are adhered to at all times to minimise the risk of accidental release to sensitive habitats.

Conclusion – Greenland white-fronted goose, greylag goose, whooper swan

Taking into consideration the embedded mitigation (Table 7-5), indirect impacts on Greenland white-fronted goose, greylag goose and whooper swan are assessed as being of negligible magnitude. Considering the limited importance of the onshore Project area for SPA qualifying features, indirect impacts would be unlikely, and if occurring would be temporary, and relatively limited in spatial extent.

It is therefore unlikely that indirect impacts would result in material effects on survival, productivity or distribution at a population level for designated species. As such, there will be no adverse effects on site integrity of the Caithness Lochs SPA. It can also be reasonably concluded that no adverse effects on site integrity of the Caithness Lochs Ramsar site will occur.

7.7.4 Assessment of adverse in-combination effects

7.7.4.1 In-combination construction, decommissioning, operation and maintenance impacts

The assessment has predicted no adverse effects on the integrity of the Caithness Lochs SPA and Ramsar site due to the development of the onshore Project alone, particularly when embedded mitigation is considered.

For all designated features (Greenland white-fronted goose, greylag goose and whooper swan), there are no predicted losses or impacts on breeding pairs, no loss of habitat and no reduction in foraging opportunities as a result of direct or indirect impacts during the construction, operational or decommissioning stages and therefore a quantitative in-combination assessment is not possible, nor required.

7.7.5 Assessment summary and conclusions

The assessment can objectively conclude that there is no adverse effect on site integrity of the Caithness Lochs SPA and Ramsar site as outlined in Table 7-11.

Table 7-11 Summary of results

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
Caithness Lochs SPA and Ramsar site	• Greenland white-fronted goose – non breeding	Construction and decommissioning	Direct disturbance / displacement.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
	• Whooper swan – non breeding • Greylag goose – non breeding		Direct habitat loss (temporary or permanent).	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Indirect impacts through effects on habitats and/or prey species.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
		Operation and maintenance	Direct habitat loss (permanent).	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Indirect impacts through effects on habitats and/or prey species.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

7.8 Caithness and Sutherland Peatlands SPA and Ramsar site

7.8.1 Site details and qualifying interests

The Caithness and Sutherland Peatlands are located across the northernmost parts of mainland Scotland. They form one of the largest and most intact areas of blanket bog in the world. The peatlands include an exceptionally wide range of vegetation and surface pattern types (pool systems), some of which are unknown elsewhere. The Peatlands support a variety of wildlife and fauna.

The Caithness and Sutherland Peatlands SPA was designated in February 1999 (amended February 2017) for breeding black-throated diver, common scoter, dunlin, golden eagle, golden plover, greenshank, hen harrier, merlin, red-throated diver, short-eared owl, wigeon, and wood sandpiper.

The Caithness and Sutherland Peatlands Ramsar site was also designated in February 1999 (amended June 2022) for bird features including breeding dunlin, breeding greylag goose and breeding bird assemblages.

The onshore Project does not overlap with the Caithness and Sutherland Peatlands SPA / Ramsar site which is located 5.4 km south-west of the onshore Project area at its closest point.

Following a consultation response from NatureScot (THC, 2023) on the HRA Screening Report (OWPL, 2023a), breeding golden eagle, a designated feature of the Caithness and Sutherland Peatlands SPA and breeding greylag goose, a designated feature of the Caithness and Sutherland Peatlands Ramsar site were screened into this RIAA because these features have a potential pathway for LSE and are also within foraging range to the onshore Project area.

The feature condition and broader conservation status of these qualifying interests of the Caithness and Sutherland Peatlands SPA and Ramsar site are summarised in Table 7-12.

Table 7-12 Qualifying interests and condition for the Caithness and Sutherland Peatlands SPA / Ramsar site

QUALIFYING INTERESTS	FEATURE CONDITION	ASSESSMENT DATE	BROADER CONSERVATION STATUS (BIRDS OF CONSERVATION CONCERN 5 (STANBURY *ET AL.*, 2021)
Golden eagle – breeding (Caithness and Sutherland Peatlands SPA)	Favourable Maintained	31st August 2016	Green List
Greylag goose – breeding (Caithness and Sutherland Peatlands Ramsar site)	Favourable Maintained	8th June 2018	Amber List

7.8.2 Conservation objectives

The Caithness and Sutherland Peatlands SPA has a designated population of breeding golden eagles of five pairs, representing 1% of the GB population and is currently assessed as 'favourable maintained' (Table 7-12).

The Caithness and Sutherland Peatlands Ramsar site maintains a breeding greylag population of international importance and is currently assessed as 'favourable maintained' (Table 7-12). Although common as winter visitors throughout Scotland, greylag geese are relatively uncommon as breeding birds, and only those in Caithness and Sutherland, the Outer Hebrides, and Wester Ross are considered native. Although widely distributed within Caithness, breeding greylag geese appear to have declined since 1970s from 60 pairs to 23 in 1991 (Davey *et al.*, 2016). However, populations are increasing in Orkney, and there is connectivity with populations on the Scottish mainland, this may result in recruitment and increased numbers on the mainland over time. The conservation objectives for the Caithness and Sutherland Peatlands SPA are as follows[12]:

- To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the site is maintained; and

[12] *The Caithness and Sutherland Peatlands SPA is also a Ramsar site. Ramsar sites do not have specific conservation objectives and as discussed in section 3.1, are not considered separately if they overlap with SACs and/or SPAs.*

- To ensure for the qualifying species that the following are maintained in the long term:
  - Population of the species as a viable component of the site;
  - Distribution of the species within site;
  - Distribution and extent of habitats supporting the species;
  - Structure, function and supporting processes of habitats supporting the species; and
  - No significant disturbance of the species.

These conservation objectives are considered in the process of determining adverse effects on integrity of the Caithness and Sutherland SPA (and by extension, Ramsar site), whereupon evidence is provided to ascertain which, and whether any of the conservation objectives may be compromised due to a predicted impact.

7.8.3 Assessment of adverse effects from the onshore Project alone

7.8.3.1 Construction and decommissioning impacts

During the baseline surveys for the onshore Project (refer to the onshore EIA Report: chapter 11: Terrestrial ornithology), one greylag goose breeding territory was recorded at Yellow Moss within 50 m of the River Thurso in the southern section of the onshore Project area approximately 1.5 km south of Halkirk. Greylag geese tend to breed in wetland areas with good ground cover. There is relatively little suitable habitat in the onshore Project area for breeding greylag geese – Yellow Moss and the adjacent area of Bloody Moss offer the best breeding habitat for this species within the onshore Project area. Royal Society for the Protection of Birds (RSPB) Scotland and BTO records confirmed that greylag geese have bred within a 2 km study area surrounding the onshore Project area within the past four years (2018 to 2022).

The onshore Project is within the foraging range for greylag goose (core range is 15 to 20 km for greylag goose, (SNH, 2016)) from the Caithness and Sutherland Peatlands Ramsar site, therefore, birds recorded within the onshore Project area and 3 km buffer[13] may potentially be designated birds.

There were no golden eagles recorded during baseline survey within the 2 km onshore study area[14] (refer to the Onshore EIA Report; chapter 11: Terrestrial ornithology). Nonetheless, as per comments received from NatureScot (see section 5), an assessment on golden eagle as a feature of the Caithness and Sutherland Peatlands SPA is also included below due to the onshore Project is theoretically within golden eagle foraging range (core range of 6 km, (SNH, 2016)) from a nest site within the Caithness and Sutherland Peatlands SPA.

[13] *A 3 km survey buffer from the Onshore Project area was implemented for goose and swan, as defined in Table 11-5 of onshore EIA Report: chapter 11: Terrestrial ornithology.*

[14] *Defined as the Onshore Project area plus a 2 km buffer.*

Based on this information and the results of the baseline surveys, it is considered that the construction and decommissioning stages may potentially impact designated bird features both directly and indirectly. Therefore, impacts of direct disturbance / displacement, direct habitat loss (temporary or permanent) and indirect impacts on greylag goose and golden eagle are scoped in to the assessment.

7.8.3.1.1 Direct disturbance / displacement

The HRA Screening Report (OWPL, 2023a) and Screening Response (section 5) identified that direct impacts of disturbance and displacement on Caithness and Sutherland Peatlands SPA and Ramsar site qualifying features may occur during construction and decommissioning works within the onshore Project area, associated with noise emissions, light emissions, visual disturbance, dust generation and/or emissions generation associated with vehicle movements and non-road mobile machinery.

Golden Eagle

The onshore Project is theoretically within golden eagle foraging range (core range of 6 km, (SNH, 2016)) from a nest site within the Caithness and Sutherland Peatlands SPA, however, baseline results did not record this species within the 2 km onshore study area[15] (refer to the Onshore EIA Report; chapter 11: Terrestrial ornithology). Furthermore, the distance between the boundary of the onshore Project area and Caithness and Sutherland Peatlands SPA is more than five times the maximum disturbance-free distance recommended for golden eagle at a nest site (1,000 m, (Goodship & Furness, 2022)).

Conclusion – Golden eagle

It is clear that, at the distance the onshore Project area lies from the Caithness and Sutherland Peatlands SPA, no nesting golden eagles would be directly affected during construction / decommissioning. The onshore Project area is unlikely to form part of a territory of an SPA breeding pair, however even if birds did extend their foraging range to the onshore Project area, any disturbance and displacement effects resulting from construction / decommissioning activities would be short-term, temporary and reversible in nature, lasting only for the duration of these activities. This is highly unlikely to affect the viability of any SPA territory or the success of any breeding attempt by an SPA pair.

It is therefore unlikely that direct disturbance / displacement impacts would result in material effects on survival, productivity or distribution at a population level for golden eagle. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SPA.

[15] *Defined as the Onshore Project area plus a 2 km buffer.*

Greylag Goose

Breeding greylag geese have been assessed to have a 'medium' disturbance sensitivity in response to human activity, this species may be disturbed when a source of human disturbance is between 200 to 600 m from a nest (Goodship & Furness, 2022). Therefore, it is considered that the construction stage may disturb breeding greylag geese within 600 m of construction activities, mainly as a result of increased human activity.

Construction activity associated with the onshore Project would last for up to four years, with HDD works taking place six months for the landfall works and six months for the main cable route crossings. The HDD works may include limited 24 hour / 7 days working programme where required during the HDD works. As a worst case scenario, construction activity may overlap with up to four breeding seasons.

Embedded mitigation (Table 7-5) for the onshore Project includes commitment to avoid construction activities during the breeding season (April to August inclusive) within an exclusion zone of 600 m surrounding a greylag nest (Table 7-4), in accordance with recommended disturbance distance buffers (Goodship & Furness, 2022). The nest will be monitored, and the exclusion zone lifted when the breeding attempt has been confirmed to have ended.

Conclusion – Greylag goose

Any disturbance and displacement effects resulting from construction / decommissioning activities would be short-term, temporary and reversible in nature, lasting only for the duration of the construction / decommissioning activities, with birds expected to return to the area once works have ceased. Furthermore, construction / decommissioning activities would not occur across the whole of the onshore Project area simultaneously or every day, but will be phased and the direct impacts will occur only in the areas where activity is taking place.

Taking into consideration the embedded mitigation, direct disturbance / displacement impacts on breeding greylag goose are assessed to be of negligible magnitude. Considering the above information for greylag goose as well as the embedded mitigation in place to avoid construction activities within 600 m of a greylag nest, direct disturbance / displacement impacts to greylag goose would be minimal, temporary and relatively limited in spatial extent.

It is therefore unlikely that direct disturbance / displacement impacts would result in material effects on survival, productivity or distribution at a population level for greylag goose. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands Ramsar site.

7.8.3.1.2 Direct habitat loss (temporary or permanent)

The HRA Screening Report (OWPL, 2023a) identified that that direct habitat loss impacts on functionally linked land for qualifying features outside of Caithness and Sutherland Peatlands SPA and Ramsar site may occur during the construction and decommissioning stages of the onshore Project.

Golden Eagle

As outlined above, the onshore Project area does not appear to form part of any golden eagle breeding territory, particularly given the distance that it lies from the Caithness and Sutherland Peatlands SPA. Even if breeding birds did extend their foraging range to the onshore Project Area, the proportion of temporary or permanent habitat loss would be negligible and unlikely to affect the viability of the territory. Embedded mitigation (Table 7-5) for the onshore Project includes a commitment to ensure that all habitats impacted by construction activities (with the exception of permanent infrastructure areas) will be re-instated to a pre-construction state immediately after works are completed in a given area.

Conclusion – Golden eagle

It can be reasonably concluded that direct habitat loss impacts would not result in material effects on survival, productivity or distribution at a population level for golden eagle. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SPA.

Greylag Goose

Suitable breeding habitat for greylag goose (i.e., wetland areas with good ground cover) is limited within the onshore Project area, the most suitable areas are wetland areas at Yellow Moss and Bloody Moss. As one greylag breeding territory was recorded at Yellow Moss during baseline surveys, there is potential that that direct habitat loss as a result of construction activity in this area could affect breeding greylag geese. The greylag territory recorded was however outside of the onshore substation search area.

Embedded mitigation (Table 7-5) for the onshore Project includes a commitment to ensure that all habitats impacted by construction activities will be re-instated to a pre-construction state immediately after works are completed in a given area. This embedded mitigation will ensure that any disruption to potential greylag goose breeding habitat is as short-term as possible.

Conclusion – Greylag goose

Greylag geese did not breed within the onshore substation search area, this area does not contain suitable greylag goose breeding habitat. Therefore, no permanent direct loss of breeding habitat is predicted.

The construction and decommissioning stages could result in some temporary short-term breeding habitat loss within the onshore export cable corridor which would be reversible in nature; habitats along the onshore export cable corridor route will be reinstated and left to mature once works are complete. This would result in a temporary reduction in the area available for breeding.

Taking into consideration the embedded mitigation, direct habitat loss impacts on breeding greylag goose are assessed to be of negligible magnitude. Considering the above information for greylag goose and after implementing the embedded mitigation measures, any effects on breeding greylag goose are likely to be minimal, temporary and relatively limited in spatial extent.

It is therefore unlikely that direct habitat loss impacts would result in material effects on survival, productivity or distribution at a population level for greylag goose. As such there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands Ramsar site.

7.8.3.1.3 Indirect impacts through effects on habitats and/or prey species

The HRA Screening Report (OWPL, 2023a) identified that indirect impacts on habitats supporting qualifying features may result from excavation and HDD processes during landfall installations, onshore export cable burial and onshore substation construction works. The reverse processes to remove the onshore export cable and onshore substation in the decommissioning stage may also have indirect impacts on habitats and/or prey species.

Golden Eagle

As outlined above, the onshore Project area does not appear to form part of any golden eagle breeding territory, particularly given the distance that it lies from the Caithness and Sutherland Peatlands SPA. Even if breeding birds did extend their foraging range to the onshore Project Area, the proportion of territory and prey resource affected would be negligible and unlikely to affect the viability of the territory.

Conclusion – Golden eagle

It can be reasonably concluded that indirect impacts would not result in material effects on survival, productivity or distribution at a population level for golden eagle. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SPA.

Greylag Goose

One greylag breeding territory was recorded at Yellow Moss within 50 m of the River Thurso in the onshore Project area. During the drilling process there is the potential for the release / breakout of inert drilling fluids which may impact the River Thurso watercourse which in turn could indirectly impact breeding graylag goose due to contamination of wetland habitats.

As part of the Project's embedded mitigation (Table 7-5), the HDD will be designed considering the ground conditions to minimise the risk of a breakout where possible. The final CEMP will include an HDD Method Statement and 'Break-out' Contingency Plan which will be prepared in advance of construction which will detail the measures to be taken in the event of a drilling fluid breakout.

Conclusion – Greylag goose

Taking into consideration the embedded mitigation, indirect impacts on breeding greylag goose are assessed to be of negligible magnitude. Based on the above information presented indirect impacts would be unlikely, and if occurring would be temporary, and relatively limited in spatial extent.

It is therefore unlikely that indirect impacts would result in material effects on survival, productivity or distribution at a population level for greylag goose. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands Ramsar site.

7.8.3.2 Operation and maintenance impacts

7.8.3.2.1 Direct disturbance due to maintenance / substation operation

Golden Eagle

The onshore Project area does not appear to form part of any golden eagle breeding territory, particularly given the distance that it lies from the Caithness and Sutherland Peatlands SPA. Even if breeding birds did extend their foraging range to the onshore Project Area, the proportion of territory affected either over a short-term period (maintenance) or long-term (substation operation) would be negligible and unlikely to affect the viability of the territory.

Conclusion – Golden eagle

It can be reasonably concluded that operational disturbance impacts would not result in material effects on survival, productivity or distribution at a population level for golden eagle. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SPA.

Greylag Goose

The HRA Screening Report (OWPL, 2023a) identified that maintenance activities along the onshore substation and/or the onshore export cable corridor may cause direct disturbance / displacement impacts on functionally linked land for greylag goose outside of the Caithness and Sutherland Peatlands Ramsar site during the operation and maintenance stages.

Results from the baseline surveys showed that although most of the onshore Project area is unsuitable, there is some potentially suitable greylag breeding habitat present within the onshore Project area – one active greylag territory was recorded. The onshore Project area is within foraging range for greylag goose from the Caithness and Sutherland Peatlands Ramsar site. Embedded mitigation (Table 7-5) for the onshore Project states that if a greylag goose nest is found, a 600 m exclusion zone (Table 7-4) surrounding the nest will be set up and maintenance works will not take place within this zone until breeding has been confirmed to have ended.

Conclusion – Greylag goose

During the operation and maintenance stage, disturbance will be limited and confined to short periods of maintenance works at the onshore substation and/or the onshore export cable corridor – these maintenance works are considered to be less than those associated with construction and decommissioning activities.

It is possible that maintenance activities may displace breeding greylag geese, but works will be temporary, and reversible in the short-term for any section of the cable route. Taking into consideration the embedded mitigation, direct disturbance / displacement impacts on breeding greylag goose are assessed as being of negligible magnitude.

After implementing the embedded mitigation measures it is considered unlikely that direct disturbance / displacement impacts would result in material effects on survival, productivity or distribution at a population level for designated breeding greylag goose. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands Ramsar site.

7.8.3.2.2 Direct habitat loss (permanent)

Golden Eagle

The onshore Project area does not appear to form part of any golden eagle breeding territory, particularly given the distance that it lies from the Caithness and Sutherland Peatlands SPA. Even if breeding birds did extend their foraging range to the onshore Project area, the proportion of territory affected by direct loss of habitat associated with the permanent footprint of the onshore substation (23.9 ha) would be negligible and unlikely to affect the viability of the territory.

Conclusion – Golden eagle

It can be reasonably concluded that permanent habitat loss would not result in material effects on survival, productivity or distribution at a population level for golden eagle. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SPA.

Greylag goose

Direct habitat loss within the footprint of the onshore substation (23.9 ha) could result in a permanent reduction in the area available for breeding. Greylag goose was not however recorded breeding within the onshore substation search area, nor does this area contain suitable greylag goose breeding habitat. Therefore, no permanent direct loss of breeding habitat is predicted.

Conclusion – Greylag goose

It is unlikely that direct habitat loss impacts would result in material effects on survival, productivity or distribution at a population level for breeding greylag goose. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands Ramsar site.

7.8.3.2.3 Indirect impacts through effects on habitats

The HRA Screening Report (OWPL, 2023a) identified that indirect effects on habitats supporting qualifying features may result from maintenance activities such as excavation works required for cable repair or replacement during the operation and maintenance stage.

Golden Eagle

Embedded mitigation (Table 7-5) for the Project includes commitment to ensuring best practice pollution prevention and control measures are adhered to at all times to minimise the risk of an accidental release to sensitive habitats.

The onshore Project area does not appear to form part of any golden eagle breeding territory, particularly given the distance that it lies from the Caithness and Sutherland Peatlands SPA. Even if breeding birds did extend their foraging range to the onshore Project area, the embedded mitigation would ensure it very unlikely that indirect impacts on habitats would affect the viability of the territory.

Conclusion – Golden eagle

It can be reasonably concluded that indirect impacts on habitats would not result in material effects on survival, productivity or distribution at a population level for golden eagle. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands SPA.

Greylag goose

Taking into consideration the embedded mitigation described above (Table 7-5), indirect impacts on breeding greylag goose are assessed as being of negligible magnitude. Considering the limited availability of suitable breeding habitat for greylag goose within the onshore Project area, indirect impacts would be unlikely, and if occurring would be temporary, and relatively limited in spatial extent.

Conclusion - Greylag goose

It is therefore unlikely that indirect impacts would result in material effects on survival, productivity or distribution at a population level for greylag goose. As such, there will be no adverse effects on site integrity of the Caithness and Sutherland Peatlands Ramsar site.

7.8.4 Assessment of adverse in-combination effects

7.8.4.1 In-combination construction, decommissioning, operation and maintenance impacts

The assessment has predicted no adverse effects on the site integrity of the Caithness and Sutherland Peatlands SPA and Ramsar site due to the development of the onshore Project alone, particularly when embedded mitigation is considered.

For the designated features of breeding golden eagle and breeding greylag goose, there were no predicted losses or impacts on breeding pairs, negligible loss of habitat and no reduction in foraging opportunities as a result of direct or indirect impacts during the construction, operational or decommissioning stages and so a quantitative in-combination assessment is not possible, nor required.

7.8.5 Assessment summary and conclusions

The assessment can objectively conclude that there is no adverse effect on site integrity of the Caithness and Sutherlands SPA or Ramsar site as outlined in Table 7-13.

Table 7-13 Summary of results

PROTECTED SITE	QUALIFYING FEATURE	PROJECT STAGE	POTENTIAL EFFECT	CONCLUSION
Caithness and Sutherland Peatlands SPA / Ramsar site	• Golden eagle – breeding (SPA) • Greylag goose – breeding (Ramsar site)	Construction and decommissioning	Direct disturbance / displacement	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Direct habitat loss (temporary or permanent).	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Indirect impacts through effects on habitats and/or prey species.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
		Operation and Maintenance	Direct habitat loss (permanent).	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.
			Indirect impacts through effects on habitats and/or prey species.	No adverse effects on site integrity from the Project alone and in-combination with other reasonably foreseeable plans and projects.

8 SUMMARY OF MITIGATION AND MONITORING

The conclusions of the Annex II species and ornithology assessments presented within this document show that there are no adverse effects on a European site's integrity either from the onshore Project either alone, or in-combination with other developments, with the commitment to the embedded (primary and tertiary) mitigations presented. As such, no secondary mitigations are proposed. Nonetheless, monitoring of these receptors will be established to make certain that no adverse effects will occur. The following monitoring measures will be implemented to protect otter, Atlantic salmon and ornithology features.

8.1 Otter

As discussed in section 6.4 (Table 6-5), an SHPP will be created and implemented to prevent harm to otter (and other protected species). The implementation of the SHPP will include pre-construction surveys for protected mammals (such as otter) as well as potentially notable habitats. These surveys will be undertaken to identify any otter making use of the onshore Project area ahead of works, allowing specific mitigation and compensation measures to be developed in consultation with NatureScot. Where necessary, a NatureScot Derogation Licence will be obtained prior to works commencing.

The following monitoring measures are proposed during construction, subject to review on finalisation of the onshore Project design at post-consent:

- Targeted monitoring will be put in place to provide a check on the identified sensitive habitats identified within pre-construction surveys, and to ensure that mitigation and protection measures are in place and effective. This will be implemented via the HMP;
- Surface water monitoring will be established within the existing watercourse network. Details are provided in SS3: Flood Risk and Drainage Assessment; and
- All areas of sensitive habitat will be visited and assessed by the ECoW prior to the commencement of any construction works. Assessment will include collection of representative photographs of the areas which are most likely to be affected by the works. Regular assessment visits will be undertaken throughout the construction period and for a minimum of 12 months after reinstatement to ensure that habitat protection is effective, and any restoration and recovery works become established.

8.2 Atlantic salmon

The assessment has used the best available evidence to inform the assessment of adverse effects on the River Thurso SAC. Consultation with the statutory advisors during the EIA process has determined the requirement for monitoring to ensure the freshwater ecology receptors (including Atlantic salmon) remain unimpacted by the Project and this will be implemented via an Aquatic Monitoring Plan. This Aquatic Monitoring Plan will ensure that any changes to the receptor baselines that are not attributable to the Project are recognised, thereby ensuring the true cause of receptor impact can be investigated by a competent agency. The Aquatic Monitoring Plan will include controls, to quantify a baseline ecological standard. This is expected to use standard family-level benthic macroinvertebrate surveys, annual fully quantitative electrofishing surveys and post-construction walkovers.

The specific detail of the monitoring cannot be determined as yet, because the specific watercourse crossing locations have not been finalised. Once the final Project infrastructure and cable routeing is confirmed during detailed design (post-consent), the Aquatic Monitoring Plan will be developed, approved and implemented based on consultation with relevant statutory regulator.

8.3 Terrestrial ornithology

A SHPP will be created and implemented to prevent harm to protected and notable bird species and habitats, including those species identified within the RIAA as features of the European sites assessed. The implementation of the SHPP will include pre-construction surveys for protected bird species as well as potentially notable habitats. These surveys will be undertaken to identify Greenland white-fronted geese, greylag geese and whooper swans making use of the onshore Project area ahead of works, allowing specific mitigation and compensation measures to be developed in consultation with NatureScot.

Targeted monitoring will be put in place to provide a check on the identified sensitive habitats identified within pre-construction surveys, and to ensure that mitigation and protection measures are in place and effective. This will be implemented via the HMP.

9 CONCLUSION OF THE RIAA

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

Finally, the Project is committed to enhancing the environment, where possible. The approach includes, but is not limited to, partnering with key stakeholders, neighbouring developers, and the local community to ensure that any proposed enhancements are suited to the environment that they are situated in benefit not only the primary species but the wider ecosystem. The Project is proposing the following measures:

- A biodiversity enhancement project to manage important habitats for farmland breeding birds due the availability of favourable habitats within the onshore Project area and due to a notable decline in the numbers of certain breeding birds (including curlew, lapwing and redshank) over recent decades;
- A biodiversity enhancement project to protect aquatic receptors within the Forss Water and River Thurso, which are a key risk habitat from climate change in combination with channel modifications; and
- A biodiversity enhancement project in relation to great yellow bumblebee. This is a nationally scarce species listed on the Scottish Biodiversity List that is now restricted to coastal areas of Orkney, the Western Isles, Caithness and Sutherland. The species has declined by 80% over the last century primarily due to loss of flower-rich meadow habitats. The Project therefore proposes to create more wildflower meadows with key flower species for great yellow bumblebees.

These measures are further detailed within an outline Biodiversity Enhancement Plan which is submitted alongside the PPP Application. The Biodiversity Enhancement Plan will be finalised after PPP has been granted, in line with further consultations.

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11 ABBREVIATIONS

ACRONYM	DEFINITION
AA	Appropriate Assessment
AIS	Air Insulated Substation
ALA	Abnormal Loads Assessment
BEP	Biodiversity Enhancement Plan
BTO	British Trust for Ornithology
CAR	Controlled Activities Regulations
CEMP	Construction Environment Management Plan
CES	Crown Estate Scotland
CfD	Contract for Difference
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CJB	Cable Joint Bay
CLO	Community Liaison Officer
CMS	Construction Method Statement
CTMP	Construction Traffic Management Plan
cSAC	Candidate Special Area of Conservation
DAQMP	Dust and Air Quality Management Plan
EEA	European Economic Area
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment

ACRONYM	DEFINITION
EMF	Electromagnetic Field
EU	European Union
EWIS	Emergency Warning and Intercommunication System
GB	Great Britain
GPS	Global Positioning System
GW	Gigawatt
GWDTE	Groundwater Dependent Terrestrial Ecosystems
Ha	Hectare
HBA	Habitat-Based Approach
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
HMP	Habitat Management Plan
HRA	Habitats Regulations Appraisal
HVAC	High Voltage Alternating Current
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
IROPI	Imperative Reasons of Overriding Public Interest
Km	Kilometre
LGV	Light Good Vehicles
LSE	Likely Significant Effect
MHWS	Mean High Water Springs

ACRONYM	DEFINITION
MLWS	Mean Low Water Springs
NVC	National Vegetation Classification
OAA	Option Agreement Area
OCT	Open Cut Trenching
OMP	Outline Management Plan
OWF	Offshore Wind Farm
OWPL	Offshore Wind Power Limited
PDE	Project Design Envelope
PIR	Passive infrared
PO	Plan Option
PPA	Power Purchase Agreement
PPP	Planning Permission in Principle
pSPA	Potential Special Protection Area
RIAA	Report to Inform Appropriate Assessment
RLB	Red Line Boundary
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SCI	Sites of Community Importance
SEPA	Scottish Environment Protection Agency
SGT	Super Grid Transformers

ACRONYM	DEFINITION
SHET-L	Scottish Hydro Electric Transmission plc
SHPP	Species and Habitat Protection Plan
SNH	Scottish Natural Heritage
SPA	Special Protection Area
SRMP	Security Risk Management Plan
SSSI	Site of Special Scientific Interest
SST	Seasonal Sensitivity Tables
STATCOM	Static synchronous compensator
SuDs	Sustainable Urban Drainage System
SUDWP	SuDS Working Party
THC	The Highland Council
TJB	Transition Joint Bay
UK	United Kingdom
WeBS	Wetland Bird Survey
WFD	Water Framework Directive
WTG	Wind Turbine Generator
ZoI	Zone of Influence

12 GLOSSARY

ACRONYM	DEFINITION
Annex I habitat	A habitat listed under Annex I of the Habitats Directive (Council Directive 92/43/EEC). Annex I habitats can be designated as a qualifying feature of a Special Area of Conservation (SAC), to ensure the conservation of these habitats. The protection of Annex I habitats within SACs persists in UK law following EU Exit.
Annex II species	A species listed under Annex II of the Habitats Directive (Council Directive 92/43/EEC). Annex II can be designated as a qualifying feature of a Special Area of Conservation (SAC), to ensure the conservation of these habitats. The protection of Annex II species within SACs persists in UK law following EU Exit.
Cable joint bays	Concrete structures which maintain the continuity of the onshore export cables over the distance of the onshore export cable route by joining sections of the onshore export circuits and thus, enable the transmission of electricity.
Competent Authority	Authority granting consent.
Dystrophic loch	A waterbody with acidic water and low oxygen levels due to high levels of dissolved humus, supporting little life.
European site	Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Sites of Community Importance (SCI) that were originally designated under EU legislation. Prior to the UK's withdrawal from the EU, the UK's European sites contributed to the Natura 2000 and were referred to as Natura 2000 sites. They now are part of the UK's National Site Network.
Habitats Regulations	The term used to refer to the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended).
Habitats Regulations Appraisal	Process of the identification and assessment of the potential for a development to have an adverse effect on the integrity on a European site.
In-situ	Refers to infrastructure from the onshore Project which will be left in its original placement i.e., infrastructure which will not be subject to full removal at decommissioning.
Likely Significant Effect (LSE)	Any effect of a plan or project that may affect the conservation objectives of the qualifying features for a European site which cannot be ruled out on the basis of objective information, either individually or in combination with other plans and projects (Tyldesley *et al.*, 2015).
Lochan	A small loch.

ACRONYM	DEFINITION
Oligotrophic Lochs	A waterbody relatively poor in plant nutrients and containing abundant oxygen in deeper areas.
Onshore Project	The entire onshore Project, including all onshore components landward of mean low-water springs (MLWS) (underground cables, substation, access, and all other associated infrastructure) and all project stages from development to decommissioning.
Pool	Used, in this case, to describe a small body of standing water.
Project	The entire offshore and onshore developments associated, including all offshore components and onshore components and all project stages from development to decommissioning.
Quaking surface	Wet mires can be unstable underfoot and are therefore often described as having a 'quaking' surface.
Transition joint bay	Concrete structures within which offshore export cables and onshore export cables are spliced together.