Planning Inspectorate

REPORT on the IMPLICATIONS for EUROPEAN SITES

Proposed Dogger Bank South Offshore Wind Farms

An Examining Authority report prepared with the support of the Environmental Services Team

Planning Inspectorate Reference: EN010125

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1 INTRODUCTION

1.1 Background

1.1.1 RWE Renewables UK Dogger Bank South (West) Limited and RWE Renewables UK Dogger Bank South (East) Limited (the applicants) have applied for a development consent order (DCO) under section 37 of the Planning Act 2008 (PA2008) for the proposed Dogger Bank South Offshore Wind Farms (the proposed development). On behalf of the Secretary of State (SoS) for Housing, Communities and Local Government, an Examining Authority (ExA) has been appointed to conduct an examination of the application. The ExA will report its findings and conclusions and make a recommendation to the relevant SoS as to the decision to be made on the application.

1.1.2 For applications submitted under the PA2008 regime, the relevant SoS is the competent authority for the purposes of the Conservation of Habitats and Species Regulations 2017 ('the Habitats Regulations') and the Conservation of Offshore Marine Habitats and Species Regulations 2017 ('the Offshore Marine Regulations' which apply beyond UK territorial waters ie 12 nautical miles). The findings and conclusions on nature conservation issues reported by the ExA will assist the SoS in performing their duties under the Habitats Regulations and the Offshore Marine Habitats Regulations.

1.1.3 This Report on the Implications for European Sites (RIES) documents and signposts the information in relation to potential effects on European sites that was provided within the DCO application and submitted during the examination by the applicants and Interested Parties (IPs), up to Deadline (DL) 5 of the examination (23 May 2025). It is not a standalone document and should be read in conjunction with the examination documents referred to. Where document references are presented in square brackets [ ] in the text of this report, that reference can be found in the examination library published on the 'Find a National Infrastructure Project' website by following the link below:

https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010125/EN010125-000619-Dogger%20Bank%20South%20-%20Examination%20Library.pdf

1.1.4 For the purpose of this RIES, in line with the Habitats Regulations and relevant government policy, the term 'European sites' includes Special Areas of Conservation (SAC), candidate SACs, proposed SACs, Special Protection Areas (SPA), potential SPAs, listed and proposed Ramsar sites and sites identified or required as compensatory measures for adverse effects on any of these sites. For ease of reading, this RIES also collectively uses the term 'European site' for European sites as defined in the Habitats Regulations 2017 and 'European Marine Sites' defined in the Offshore Marine Habitats and Species Regulations 2017, unless otherwise stated. The 'UK National Site Network' refers to SACs and SPAs belonging to the United Kingdom

already designated under the Directives and any further sites designated under the Habitats Regulations.

1.1.5 This RIES is issued to ensure that IPs, including Natural England (NE), Joint Nature Conservation Committee (JNCC) and NatureScot as the Appropriate Nature Conservation Bodies (ANCB), are consulted formally on Habitats Regulations matters. This process may be relied on by the SoS for the purposes of Regulation 63(3) of the Habitats Regulations and Regulation 28(4) of the Offshore Marine Habitats Regulations.

1.1.6 It also aims to identify and close any gaps in the ExA's understanding of IPs' positions on Habitats Regulations matters, in relation to all European sites and qualifying features as far as possible, in order to support a robust and thorough recommendation to the SoS.

1.1.7 Following consultation, the responses will be considered by the ExA in making its recommendation to the SoS and made available to the SoS along with this report. The RIES will not be revised following consultation.

1.2 Documents used to inform this RIES

1.2.1 The applicants' Habitats Regulations Assessment (HRA) Report ('the HRA Report') comprised the following documents:

- Document 6.1 Report to Inform Appropriate Assessment (RIAA) HRA Part 1 of 4 – Introduction and Terrestrial Ecology ('RIAA Part 1') ([APP-045], updated in [REP5-007])
- Document 6.1 RIAA HRA Part 2 of 4 – Annex I Offshore Habitats and Annex II Migratory Fish ('RIAA Part 2') ([APP-046], updated in [AS-051] and [REP4-014])
- Document 6.1 RIAA HRA Part 3 of 4 – Annex II Marine Mammals ('RIAA Part 3') ([APP-047] updated in [REP5-009])
- Document 6.1 RIAA HRA Part 4 of 4 – Marine Ornithological Features ('RIAA Part 4') ([APP-048], updated in [AS-085] and [REP4-016])
- Document 6.1.1 RIAA Appendix A - Habitats Regulations Assessment Screening ('HRA Screening') [APP-049]
- Document 6.1.2 RIAA Appendix B - Sandeel Habitat Potential in the Dogger Bank SAC and Southern North Sea (SNS) SAC [APP-050]

1.2.2 The HRA Report concluded that adverse effects on the integrity (AEoI) of two European sites cannot be excluded (Flamborough and Filey Coast (FFC) SPA and Dogger Bank SAC); details are provided in section 3 of this RIES. Derogations under the Habitat Regulations and compensatory measures are therefore required. An overview of these matters, including relevant documents, is provided in section 4 of this RIES.

1.2.3 The derogations case also included information on a without prejudice basis in respect of the razorbill feature of the FFC SPA, in the event that the SoS

is unable to reach a conclusion of no AEoI with respect to razorbill (paragraph 330 of RIAA Part 4 [REP4-016]).

1.2.4 In addition to the HRA Report and the Environmental Statement (ES) chapters and appendices which support and inform it, the RIES refers to representations submitted to the examination by the applicants, IPs, Issue Specific Hearing (ISH) documents, Statements of Common Ground (SoCG) and other examination documents as relevant. All documents can be found in the Examination Library.

1.3 Change Requests

1.3.1 To date, the applicants have made the following change requests:

Changes to the proposed development during pre-examination

- Change Request 1 dated 10 January 2025 [AS-129; AS-135 to AS-144], accepted by the ExA on 21 January 2025 [PD-012]. The changes broadly comprised changes to the offshore works:
  - removal of Gravity Base Structure (GBS) foundations
  - removal of Electrical Switching Platform (ESP) from the design envelope
  - reduction of the number of platforms in the design envelope, plus associated scour protection
  - reduction of cabling within the array areas, plus associated seabed preparation and cable protection
  - removal of the short trenchless crossing option at landfall
- Change Request 2 dated 10 January 2025 [AS-129; AS-145 to AS-152], accepted by the ExA on 21 January 2025 [PD-012]. The changes broadly comprised changes to the onshore works:
  - reduction in footprint of the onshore converter station(s)
  - removal of the proposed Yorkshire Water pipeline diversion
  - reduction in size and change in the indicative location of the proposed sustainable drainage systems and changes to the proposed landscaping

1.3.2 Relevant HRA matters arising from these change requests are detailed in sections 2 (likely significant effects (LSE)), 3 (AEoI) and 4 (derogations) of this RIES.

1.4 RIES questions

1.4.1 This RIES (and Annex 1) contains numbered questions predominantly targeted at the applicants and NE, which are drafted in **blue, bold text**.

1.4.2 The responses to the questions posed in the RIES and comments received on it will be of great value to the ExA in understanding IPs' positions on Habitats Regulations matters. It is stressed that responses to other matters discussed in the RIES are equally welcomed.

1.4.3 Comments on the RIES and responses to the RIES questions should be submitted by DL7 (26 June 2025).

1.5 HRA matters considered during the examination

1.5.1 The examination to date has focussed on the key issues detailed below.

Terrestrial ecology and ornithology

Humber Estuary SAC, SPA and Ramsar site:

- air quality impacts (from construction traffic, non-road mobile machinery (NRMM) and vessel movements)
- indirect effects on the Humber Estuary SPA and Ramsar site features from impacts on benthic habitats of the Humber Estuary SAC

Annex I benthic habitats

Dogger Bank SAC:

- the quantification of physical change to another seabed or sediment type (permanent habitat loss/ change), for which the applicants concluded AEoI, as a result of:
  - the need to consider ecological halo effects
  - queries regarding the maximum design scenario of scour and cable protection
  - the need for an end date for cable and scour protection deployment
  - the need to decommission cable and scour protection
  - use of as-built habitat loss for in-combination assessments
- NE's disagreement with the applicants' conclusions of no AEoI on Annex I sandbanks from abrasion or disturbance of substrate (habitat damage), due to:
  - timescales for recovery of Annex I sandbanks
  - the effects from the placement of dredged material and drill arisings from construction activities
- changes to the wave and tidal regime
- indirect effects (impacts on sandeel leading to impacts on the characteristic community and ecological function of Dogger Bank SAC)

- the quantum of compensation proposed by the applicants for physical change to another seabed or sediment type (habitat loss)

Flamborough Head SAC:

- the conclusions of no AEoI of the Flamborough Head SAC as a result of queries over the baseline data collection and habitat sensitivity

Humber Estuary SAC:

- the conclusions of no AEoI of the Humber Estuary SAC as a result of impacts from nearshore cable protection and interruption to sediment transport
- air quality impacts due to construction traffic
- in-combination effects

Annex II migratory fish

Humber Estuary SAC and Humber Estuary Ramsar site:

- indirect impacts through effects on preferred prey availability

Annex II marine mammals

SNS SAC, Berwickshire and North Northumberland Coast (BNNC) SAC, Humber Estuary SAC and Humber Estuary Ramsar site:

- scoping out of permanent auditory injury (Permanent Threshold Shift (PTS)) from the cumulative and in-combination assessments
- behavioural impacts on harbour porpoise and grey seal resulting from underwater noise, sufficiency of proposed mitigation and whether an AEoI can be excluded

SNS SAC:

- indirect effects on harbour porpoise from impacts on forage fish prey species and whether an AEoI can be excluded

Marine (and intertidal) ornithology

Overarching assessment issues:

- the applicants' approach to various aspects of the assessments not being in accordance with SNCB advice, including, abundance estimates, baseline mortality rates, displacement and mortality rates, seasonality, apportioning, population viability analysis (PVA), consideration of combined impacts of the two arrays and in-combination effects and projects for inclusion within the in-combination assessments
- digital aerial survey methodology

- disagreements over the levels of precaution in the assessment

FFC SPA:

- adequacy of the applicants' proposed mitigation measures to reduce impacts on seabird features
- indirect effects from impacts on forage fish prey species
- inputs for and interpretation of PVA
- disagreements over the applicants in-combination impact totals
- consideration of population trends including from Highly Pathogenic Avian Flu (HPAI) and climate change
- compensation measures, including:
  - methods for determining the level of required compensation and associated levels of precaution
  - presentation of confidence intervals (CI)
  - effectiveness, mechanisms for delivery, scale, location and timing

Farne Islands SPA:

- lack of an in-combination assessment for guillemot and puffin displacement
- disagreements over the applicants' conclusions of no AEoI
- the need to incorporate compensation within that provided for FFC SPA

Greater Wash SPA:

- concerns regarding cable installation and the potential need for seasonal restrictions to avoid adverse effects
- lack of an in-combination assessment for red-throated diver (RTD) displacement

Forth Islands SPA:

- disagreement of the significance of impacts to the gannet feature

1.5.2 It should be noted that NE submitted a 'Risk and Issues Log', incorporating a Principal Areas of Disagreement Summary Statement (PADSS), and detailed advice appendices which has been updated periodically throughout the examination. This provided NE's view of key issues and whether or not they had been resolved. This RIES has not sought to replicate every issue within the Risk and Issues log.

2 LIKELY SIGNIFICANT EFFECTS

2.1 European sites considered

Introduction

2.1.1 The proposed development is not connected with or necessary to the management for nature conservation of any European site.

2.1.2 Section 3.3 of the HRA Screening [APP-049] sets out the process undertaken by the applicants to identify the European sites and features to be included in the screening assessment. This was based on the following criteria:

- criterion 1: European or Ramsar site overlaps with the proposed development site boundary
- criterion 2: European or Ramsar site with qualifying mobile features/ species (eg Annex I birds, Annex II marine mammals, migratory fish) whose range (eg foraging, migratory, overwintering, breeding or natural habitat range) overlaps with the proposed development
- criterion 3: European or Ramsar site and/ or qualifying interest features located within the potential Zone of Influence (ZoI) of impacts associated with the proposed development (eg habitat loss/ disturbance, noise and risk of collision)

Sites within the UK National Site Network (NSN)

2.1.3 The applicants' HRA Screening [APP-049] detailed the European sites within the UK National Site Network for inclusion within the assessment. This was based on the following receptor types:

- section 4.1 - sites designated for Annex I offshore habitats – 3 UK European sites in Table 4-2 and Figure 4-1 of [APP-049]
- section 4.2 - sites designated for Annex II migratory fish – 2 UK European sites in Table 4-4 and Figure 4.2 of [APP-049]
- section 4.3 - sites designated for Annex II marine mammals – 5 UK European sites in Table 4-7 and Figures 4-3 and 4-4 of [APP-049])
- section 4.4 - sites designated for marine ornithological features – 105 UK European sites in Table 4-10 and [PDA-007]
- section 4.5 - sites designated for terrestrial ecology – 5 UK European sites on Figure 4-5 of [APP-049]

2.1.4 It should be noted that some European sites were included in the assessment for more than one receptor group (eg Humber Estuary SAC, Humber Estuary SPA and Hornsea Mere SPA).

2.1.5 No additional UK European sites have been identified by IPs for inclusion within the assessment in the examination to date.

2.1.6 In respect of terrestrial ecology and onshore ornithology, NE agreed that all relevant sites and features had been screened into the assessment [RR-039, I5]. NE also agreed that all relevant sites had been screened in for Annex I offshore habitats and Annex II migratory fish [RR-039, C28] and stated it was broadly content with features and pathways screened for offshore ornithology, with some concerns regarding features screened in for the in-combination assessment (see section 3.8 of this RIES) [RR-039, G30].

2.1.7 European sites located within England and Scotland have been identified for consideration within the assessment. NE registered as an IP and has participated in the examination. JNCC did not register as an IP, with NE's Relevant Representation (RR) [RR-039] explaining that NE is authorised to exercise JNCC's functions as a statutory consultee in respect of applications for offshore renewable energy installations in offshore waters (0-200nm) adjacent to England (including the application for the proposed development). In response to [HRA.2.2, PD-022], JNCC confirmed that NatureScot has sole responsibility for the Moray Firth SAC, located in Scottish territorial waters [REP5-047].

2.1.8 The ExA [HRA.1.4, PD-014] [HRA.2.3, PD-022] asked NatureScot to confirm whether it was in agreement with the applicants' conclusions presented in the HRA Screening [APP-049] and RIAA Part 3 [REP5-009] and Part 4 [REP4-016] for the relevant Scottish sites.

2.1.9 At the time of publication of this RIES, NatureScot had not responded or submitted any representations to the examination.

2.1.10 The ExA also directed questions to Natural Resources Wales (NRW) on the basis that one of the applicants' potential compensation sites (Worms Head) is located in Wales [OR.2.10, PD-022].

Non-UK sites

2.1.11 The applicants' HRA Screening [APP-049] also identified the following numbers of non-UK European sites for inclusion within the assessment:

- Annex II migratory fish – 2 sites in Table 4-5
- Annex II marine mammals – 35 sites in Table 4-7
- marine ornithological features – 13 sites in Table 4-10

2.1.12 The applicants concluded no LSE for all non-UK sites designated for Annex II migratory fish and marine ornithological features.

2.1.13 The applicants identified a LSE on harbour porpoise, grey seal and harbour seal of the Klaverbank SAC and harbour porpoise, grey seal and harbour seal of the Doggersbank SAC in the Netherlands (Table 4-7 of the HRA Screening [APP-049] and section 8.3.12 of the RIAA Part 3 [REP5-009]). The applicants concluded no AEoI from the project alone or in-combination for both of these sites (section 8.3.12 of the RIAA Part 3 [REP5-009]).

2.1.14 Only sites within the UK NSN are addressed in this RIES.

2.2 Potential impact pathways

2.2.1 Section 4 of the HRA Screening [APP-049] detailed the potential impact pathways from the proposed development during construction, operation and decommissioning. The HRA Screening stated that "Impacts during decommissioning are expected to be similar in nature to those anticipated during construction, but of smaller magnitude."

2.2.2 The impact pathways considered for each receptor group are summarised in Table 2.1 below.

Table 2.1: Pathways for LSE assessed by the applicants

C – Construction O – Operation D – Decommissioning

Receptor group	LSE pathway
Annex I habitats (Table 4-1 of [APP-049])	• abrasion/ disturbance of the substrate on the surface of the seabed (C, O, D) • changes in suspended solids (water clarity) (C, O, D) • electromagnetic changes (O) • habitat structure changes – removal of substratum (extraction) (C) • hydrocarbon & Polyaromatic Hydrocarbon (PAH) contamination (C, O, D) • introduction or spread of invasive non-indigenous species (INIS) (C, O, D) • penetration and/ or disturbance of the substratum below the surface of the seabed, including abrasion (C, D) • physical change (to another seabed type) (C, O, D) • physical change (to another sediment type) (C, O, D) • smothering and siltation rate changes (heavy) (C, O, D) • smothering and siltation rate changes (light) (C, O, D) • synthetic compound contaminant (including pesticides, antifoulants, pharmaceuticals) (O)
Annex II migratory fish species	• barrier to species movement (C, D) • changes in suspended solids (water clarity) (C, D)

Receptor group	LSE pathway
(Table 4-3 of [APP-049])	• electromagnetic changes (O) • physical change (to another seabed type) (C, O, D) • physical change (to another sediment type) (C, O, D) • smothering and siltation rate changes (heavy) (C, O, D) • smothering and siltation rate changes (light) (C, O, D) • underwater noise (C)
Annex II marine mammals (Table 4-6 of [APP-049])	• physical or auditory injury resulting from underwater noise (C, O, D) • behavioural impacts resulting from underwater noise (C, O, D) • disturbance from vessels due to presence and underwater noise (C, O, D) • barrier effects from underwater noise (C, O, D) • vessel interaction (increase in risk of collision) (C, O, D) • disturbance at seal haul-out sites (C, O, D) • disturbance to seals foraging at sea (C, O, D) • barrier effects due to the physical presence of offshore infrastructure (O) • changes to prey availability (C, O, D)
Marine ornithological features (Table 4-9 of [APP-049])	• disturbance/ displacement (C, O, D) • indirect impacts through effects on habitats and prey species (C, O, D) • collision risk (O) • barrier effects (O)
Terrestrial ecology (Table 4-12 of [APP-049])	• permanent and temporary loss of habitats (C, O, D) • temporary habitat fragmentation and species isolation (C, O, D) • impacts on protected species or on their resting or breeding sites (C, O, D) • disturbance of bird populations (C, O, D) • spread of non-native invasive species (C, O, D)

2.2.3 NE [RR-039] identified additional impact pathways for Annex II migratory fish species (indirect impacts through effects on preferred prey availability) and for terrestrial ecology (air quality impacts due to vessel movements and back-up generators).

2.2.4 Otherwise, no additional impact pathways have been identified by IPs for inclusion within the assessment in the examination to date.

2.3 In-combination effects - screening

2.3.1 Section 3.3.1 of the HRA Screening [APP-049] detailed the applicants' approach to assessing in-combination effects. It stated that it is based on a tiered approach following NE's 'Phase III Best Practice for Data Analysis and Presentation at Examination guidance note', which is detailed in Table 3-2 of the HRA Screening.

2.3.2 The applicants did not identify specific projects for the in-combination assessment in relation to features of terrestrial or marine ornithological features of European sites. The HRA Screening [APP-049] explained that the potential for in-combination effects would be explored in subsequent stages of the assessment.

2.4 The applicants' assessment

2.4.1 Table 5-1 of the HRA Screening [APP-049] summarised the qualifying features for which an LSE impact pathway was identified in the applicants' initial screening exercise.

2.4.2 However, the applicants [AS-003] explained that the HRA Screening was previously issued to stakeholders alongside the Preliminary Environmental Information Report (PEIR) in June 2023. The applicants' screening conclusions were subsequently updated to reflect feedback and the RIAA Parts 1 to 4 [APP-045 to APP-048] represented the applicants' screening position at the point of application. Changes to the screening conclusions were discussed within:

- section 4.5.4 of the RIAA Part 1 [APP-045, superseded by REP5-007] and section 9.3 of the RIAA Part 4 [APP-048, superseded by REP4-016] for marine ornithology
- section 6.2 of RIAA Part 2 [APP-046, superseded by REP4-014] for Annex I habitats
- section 8.2 of RIAA Part 3 [APP-047, superseded by REP5-009] for marine mammals
- appendix A of [AS-003] also provided a list of the changes between the HRA Screening [APP-049] and the RIAA [APP-045 to APP-048]

2.4.3 This RIES has therefore reflected the LSEs assessed in the RIAA Parts 1 to 4, as summarised in Tables 1 and 4-7 of [REP5-007].

Sites for which the applicants concluded no LSE on all qualifying features

2.4.4 The applicants concluded that the proposed development would not be likely to give rise to significant effects, either alone or in combination with other projects or plans, on all qualifying features of the following UK European sites:

- England (HRA Screening Table 4-10):
  - Abberton Reservoir SPA and Ramsar site
  - Alde-Ore Estuary SPA and Ramsar site
  - Benfleet & Southend Marshes SPA and Ramsar site
  - Blackwater Estuary SPA and Ramsar site
  - Broadland SPA and Ramsar site
  - Breydon Water SPA and Ramsar site
  - Chesil Beach & The Fleet SPA
  - Chichester & Langstone Harbours SPA
  - Colne Estuary SPA and Ramsar site
  - Crouch & Roach Estuaries SPA and Ramsar site
  - Deben Estuary SPA and Ramsar site
  - Dengie SPA and Ramsar site
  - Exe Estuary SPA
  - Foulness SPA and Ramsar site
  - Gibraltar Point SPA and Ramsar site
  - Great Yarmouth and North Denes SPA
  - Hamford Water SPA and Ramsar site
  - Hornsea Mere SPA
  - Lindisfarne SPA and Ramsar site
  - Lower Derwent Valley SAC
  - Lower Derwent Valley SPA
  - Lower Derwent Valley Ramsar site
  - Medway Estuary & Marshes SPA and Ramsar site
  - Minsmere - Walberswick SPA and Ramsar site
  - North Norfolk Coast SPA and Ramsar site

  - Northumbria Coast SPA and Ramsar site
  - Northumberland Marine SPA
  - Outer Thames Estuary SPA
  - Portsmouth Harbour SPA
  - Solent & Southampton Water SPA
  - Stour & Orwell Estuaries SPA and Ramsar site
  - Teesmouth and Cleveland Coast SPA and Ramsar site
  - Thames Estuary and Marshes SPA and Ramsar site
  - Thanet Coast and Sandwich Bay SPA and Ramsar site
  - The Swale SPA
  - The Wash SPA and Ramsar site
- Scotland:
  - Bluemull and Colgrave Sounds SPA
  - Cromarty Firth SPA
  - Dornoch Firth and Loch Fleet SPA
  - East Mainland Coast, Shetland SPA
  - East Sanday Coast SPA
  - Fetlar SPA
  - Firth of Forth SPA
  - Firth of Tay & Eden Estuary SPA
  - Inner Moray Firth SPA
  - Imperial Dock Lock, Leith SPA
  - Loch Leven Ramsar site
  - Loch of Strathbeg SPA
  - Montrose Basin SPA
  - Moray and Nairn Coast SPA
  - Mousa SPA
  - Papa Stour SPA
  - Papa Westray (North Hill and Holm) SPA
  - Pentland Firth Islands SPA
  - Ronas Hill - North Roe and Tingon SPA and Ramsar site

- Seas off Foula SPA
- Ythan Estuary, Sands of Forvie and Meikle Loch SPA

2.4.5 No sites were screened out entirely for Annex I habitats, Annex II fish and Annex II marine mammals.

2.4.6 The applicants' conclusion of no LSE with respect to the sites listed in paragraph 2.4.4 above has not been disputed to date in the examination.

RIES Q1. To NE: Can NE confirm whether it agrees with the applicants' conclusion of no LSE, either alone or in combination with other projects or plans, on all qualifying features of the European sites listed in paragraph 2.4.4 above?

2.4.7 For some European sites with terrestrial or marine ornithological features, the applicants concluded no LSE 'alone' and did not go on to consider potential in-combination effects for those sites.

2.4.8 ExQ1 [HRA 1.2, PD-014] asked that for all sites for which a LSE has been excluded from the project alone, the applicants provide a robust rationale for the conclusion of no LSE from the project in-combination with other plans or projects. The applicants' response [HRA1.2, REP3-027] signposted to its assessments of AEoI but did not provide the requested information in relation to its screening conclusions.

2.4.9 This was pursued by the ExA in ExQ2 [HRA.2.4, PD-022]. The applicants responded [REP5-036] that the rationale for screening out sites on the likelihood of the risk of LSE was based initially on proposed development alone effects, but also on the potential for a contribution to in-combination effects. The applicants stated that although in combination effects were not explicitly detailed in the rationale presented in [APP-049], the basis for screening out proposed development alone effects was considered to also rule out the risk of contributing to an LSE in combination.

Sites for which the applicants concluded LSE on some or all qualifying features

2.4.10 The applicants concluded that the proposed development would be likely to give rise to significant effects, either alone or in combination with other projects or plans, on one or more of the qualifying features of the sites detailed in Annex 1 of this RIES. The qualifying features and LSE pathways screened in by the applicants are also identified in Annex 1 of this RIES.

2.5 Pre-examination and examination matters

Examination overview

2.5.1 The applicants' initial screening conclusions presented in [APP-049] were disputed by IPs and/ or questioned by the ExA during examination in respect of the following receptor groups:

- Annex I habitats (project alone or in-combination) (see Table 2.2 below)

- Annex II migratory fish (project alone or in-combination) (see Table 2.3 below)
- terrestrial ecology (project alone or in-combination) (see Table 2.4 below)

2.5.2 No specific concerns were raised in relation to screening of marine mammals.

2.5.3 No specific concerns were raised in relation to screening of marine ornithology. NE [RR-039, G30] confirmed it was "broadly content with the features and pathways screened in for assessment", although identified a lack of in-combination assessments for guillemot and puffins at Farne Islands SPA, puffins at FFC SPA and RTD at the Greater Wash SPA [RR-039, G50]. See section 3.8 of this RIES for further details.

Matters discussed during examination

2.5.4 Matters raised to date, or those for which the ExA seeks clarity, in relation to LSEs screened out (or not considered) by the applicants are summarised in Tables 2.2 and 2.3 below.

2.5.5 The ExA has noted where it understands that matters are resolved and included observations/ questions where matters are outstanding.

2.5.6 Note that matters relating to semantics/ minor clarifications have not been included.

Table 2.2: Annex I habitats - issues raised in the examination to date by the ExA and IPs in relation to the applicants' screening of LSEs (alone or in-combination)

ID	Issue	Detail of issue and relevant documents	ExA observation/ question
Flamborough Head SAC - vegetated sea cliffs of the Atlantic and Baltic Coasts			
2.2.1	Smothering and siltation rate changes (heavy and light)	The vegetated sea cliffs of the Atlantic and Baltic Coasts feature of the Flamborough Head SAC was not considered in the applicants' screening assessment. NE's RR [RR-039] identified this as a feature for which outstanding concerns remained. The applicants subsequently explained in the RIAA Part 2 [REP4-014] that there would be no interaction of concern between the vegetated sea cliffs of the Atlantic and Baltic Coasts and construction of the Offshore Export Cable Corridor (ECC). NE has confirmed agreement that there was no interaction of concern [REP5-055] [REP5-062].	On the basis of the agreements reached, the ExA assumes that LSE can be excluded for this feature, but requests confirmation from the applicants and NE. **RIES Q2. To the applicants and NE: The applicants and NE are requested to confirm whether they consider that LSE can be excluded for the vegetated sea cliffs of the Atlantic and Baltic Coasts feature of the Flamborough Head SAC.**
Sites with Annex I habitat features			
2.2.2	ZoI - sediment plumes from construction activities	NE [RR-039, C39] noted that the applicants' 8km ZoI for sediment plumes from cable trenching and levelling in the RIAA Part 2 [REP4-014] was inconsistent with the ES. The applicants [AS-048] [REP3-026] [REP3-028] acknowledged that the correct figure was 14km, but considered the change in ZoI would not alter the designated sites	The ExA understands this matter to be resolved.

ID	Issue	Detail of issue and relevant documents	ExA observation/ question
		screened in for assessment within this report or the outcomes of the assessment itself due to the low sensitivity of the biotopes within the Dogger Bank SAC. The 'Benthic Ecology Technical Note' [REP3-025] was appended to the RIAA Part 2 [REP4-014] to add context regarding updates to the ZoI. NE subsequently confirmed that the issue was resolved [REP4-129].	

Table 2.3: Annex II migratory fish - issues raised in the examination to date by the ExA and IPs in relation to the applicants' screening of LSEs (alone or in-combination)

ID	Issue	Details of issue and relevant documents	ExA observation/ question
Humber Estuary SAC and Humber Estuary Ramsar site - sea lamprey and river lamprey			
2.3.1	Indirect impacts through effects on preferred prey availability	The applicants [APP-049] [APP-045] identified LSE on sea lamprey and river lamprey of the Humber Estuary SAC (as a result of underwater noise and vibration impacts due to unexploded ordnance (UXO) clearance during construction). NE considered that [RR-039, E34] indirect effects on prey availability should also be considered but did not indicate which phase of the development this related to. The applicants [AS-048, REP2-058] advised that given the wide range of prey types, determining any source-pathway-receptor relationship specific to the proposed development is not possible for either river lamprey or sea lamprey. NE maintained its position [REP3-059] [REP4-129] and confirmed it holds the same view for the Humber Estuary Ramsar site [REP3-059]. NE has acknowledged that the uncertainties and data poor environment would prevent a reliable assessment being made [REP3-059, REP4-129]. Annex II migratory fish features of the Humber Estuary Ramsar site were not considered in the applicants' screening assessment.	**RIES Q3. To NE: NE is requested to confirm which phase(s) it considers this impact pathway should be screened in for.** **RIES Q4. To the applicants: The applicants are requested to confirm how they have considered LSE on sea lamprey and river lamprey of the Humber Estuary Ramsar.**
Sites with Annex II migratory fish features			
2.3.2	Impacts from underwater noise	NE advised [RR-039, E35] that clarity was needed on whether impacts on Annex II migratory fish from piling concurrently in both DBS East and DBS West had been considered. NE also advised	The ExA understands this matter to be resolved.

		that the worst case piling event for migratory fish species is likely to be when piling takes place in the Offshore ECC, given its proximity to the coast. As part of Change Request 1, piling along the Offshore ECC was removed from all construction scenarios [AS-129; AS-135 to AS-144]. NE confirmed at DL3 that this concern was resolved, following the removal of the need for piling in the Offshore ECC [REP3-060].	

Table 2.4: Terrestrial Ecology - issues raised in the examination to date by the ExA and IPs in relation to the applicants' screening of LSEs (alone or in-combination)

ID	Issue	Details of issue and relevant documents	ExA observation/ question
Humber Estuary SAC, SPA and Ramsar site			
2.4.1	Air quality impacts due to vessel movements	NE [RR-039, I7] advised that if the operational port where vessels are to be moored is in the Humber Estuary SAC/ SPA, that provision of a Port Management Plan should be secured in the DCO and required to be submitted prior to construction works commencing, taking into account air quality impacts and vessel management. The applicants confirmed [AS-048] they had excluded an assessment of onshore air quality effects resulting from offshore vessels associated with offshore construction, operation, and decommissioning. They confirmed that the mean average maximum number of vessel return trips required per year for construction (1,502) and operation (473) would be below the screening criteria included in 'Local Air Quality Management (LAQM) TG22 (Department for Environment, Food and Rural Affairs' (DEFRA), 2022). The applicants also noted that it was agreed by the Planning Inspectorate that this pathway could be scoped out of the accompanying ES. NE subsequently agreed with the applicants' conclusions [REP1-066] [REP4-129].	The ExA understands this matter to be resolved.
2.4.2	Air quality impacts due to back up generators	NE [RR-039, I9] noted that the location of back-up generators are undecided and therefore advised that the Outline Code of Construction Practice (CoCP) [APP-234] should be updated to include separation buffers to designated sites.	The ExA understands this matter to be resolved.

		The applicants [AS-048] confirmed that the assessments indicated that any local air quality impact from back-up generators is unlikely to be significant. They noted the requirement (dependent on generator size and usage) to obtain a permit from the Environment Agency. Consequently, the applicants did not propose to update the Outline CoCP. NE [REP1-065] stated it would prefer a front-loaded approach to management of impacts, however confirmed no further examination of the matter was required and that it would provide any further advice on this matter during the permitting stage if required.	

2.6 Summary of examination outcomes in relation to screening

2.6.1 The ExA understands that all matters relating to LSEs have been resolved with the exception of indirect impacts through effects on preferred prey availability to sea lamprey and river lamprey of Humber Estuary SAC and Humber Estuary Ramsar site (see ID 2.3.1); and smothering and siltation rate changes (heavy and light) on vegetated sea cliffs of the Atlantic and Baltic Coasts of Flamborough Head SAC (see ID 2.2.1). The ExA has requested clarification from the applicants and NE on these matters as set out above.

2.6.2 For the avoidance of doubt, where there is dispute or where it is not clear to the ExA whether an LSE should be screened in, the ExA has taken a precautionary approach in this RIES and considered the impact pathway in section 3. This conclusion is not final and could be subject to change further to any additional representations received during the examination.

2.6.3 The ExA has produced a summary of what it considers to be all LSE pathways in Annex 1 of this RIES. The applicants and ANCBs are invited to review the annex and provide any corrections if necessary.

3 ADVERSE EFFECTS ON INTEGRITY

3.1 Conservation objectives

3.1.1 The conservation objectives for all of the European sites for which a LSE was identified by the applicants at the point of the DCO application were included in the HRA Report (RIAA Parts 1 [REP5-007], 2 [REP4-014], 3 [REP5-009] and 4 [REP4-016]). NE also provided links to the conservation objectives in [REP5-053] for sites where it had or previously had outstanding concerns.

3.1.2 In [REP3-027, Appendix E] the applicants noted that the following UK sites were in unfavourable condition and/ or have a restore conservation objective target:

- Humber Estuary SPA – dunlin, ruff, bar-tailed godwit, common redshank
- Dogger Bank SAC – sandbanks which are slightly covered by sea water all the time
- River Derwent SAC – sea lamprey and river lamprey
- The Wash and North Norfolk Coast SAC – harbour seal
- BNNC SAC – grey seal
- FFC SPA; Sumburgh Head SPA; Forth Islands SPA; Fowlsheugh SPA; St Abbs Head to Fast Castle SPA; and Buchan Ness to Collieston Coast SPA – kittiwake
- Hermaness, Saxa Vord and Valla Field SPA; Noss SPA; Farne Islands SPA; and Hoy SPA – kittiwake, guillemot and puffin
- Troup, Pennan and Lion's Heads SPA – guillemot and razorbill
- North Caithness Cliffs SPA – kittiwake and puffin
- Calf of Eden SPA; Marwick Head SPA; Copinsay SPA; and Rousay SPA – kittiwake and guillemot
- West Westray SPA – kittiwake, guillemot and razorbill
- Fair Isle SPA; and Foula SPA - kittiwake, guillemot, razorbill and puffin

3.1.3 The applicants noted [REP3-027, Appendix E] that condition assessments were not available for the following site features:

- Humber Estuary SPA – red knot and little tern
- Flamborough Head SAC – reefs and submerged or partially submerged sea caves
- Humber Estuary SAC – mudflats and sandflats not covered by sea water at low tide, sea lamprey and river lamprey

- Greater Wash SPA – RTD and common scoter
- Coquet Island SPA - puffin

3.2 The applicants' assessment

3.2.1 The European sites and qualifying features for which LSE were identified were further assessed by the applicants to determine if they could be subject to AEoI from the proposed development, either alone or in combination.

Mitigation measures

3.2.2 The mitigation measures taken into account in the applicants' assessment of effects on integrity were detailed in the HRA Report as follows:

- terrestrial ecology (section 5 of RIAA Part 1 [APP-045, superseded by REP5-007]):
  - Ecological Management Plan (EMP) to be developed in accordance with the Outline EMP (OEMP) ([APP-235, updated by [REP4-042])
- offshore Annex I habitats (Table 6-2 of RIAA Part 2 [APP-046, superseded by REP4-014]):
  - Cable Burial Risk Assessments and Cable Protection Plans, to be produced in line with the detail outlined in the Cable Statement ([APP-244, updated by [REP4-050])
  - Project Environmental Management Plan (PEMP) to be developed in accordance with the Outline PEMP ([APP-245], updated by [REP2-041] (to include a Marine Pollution Contingency Plan (MPCP))
  - Offshore Operations and Maintenance Plan (OOMP) to be developed in accordance with the Outline OOMP ([APP-248], updated by [REP2-045])
  - Conditions in the Deemed Marine Licence (DML) in relation to cable protection and sediment disposal.
- Annex II migratory fish (section 7.3.1 of RIAA Part 2 [APP-046, superseded by REP4-014]):
  - Low-order methods would be utilised for the detonation of UXO where viable. This is stated to be the default method within the Outline Marine Management Mitigation Protocol (Outline MMMP) [APP-249, updated by REP4-054]. The MMMP is to be developed in accordance with the Outline MMMP; secured through Condition 14 of Marine Licences 3 and 4 of the dDCO ([APP-027], updated by [REP5-002]).

- marine mammals (Tables 8-2 and 8-3 of RIAA Part 3 [APP-047, superseded by [REP5-009])
  - Site Integrity Plan (SIP) to be developed in accordance with the In Principle SIP ([APP-250], updated by [REP2-049])
  - a PEMP to be developed in accordance with the Outline PEMP ([APP-245], updated by [REP2-041]); secured through Condition 14 (SIP) of Marine Licences 3 and 4 of the dDCO [APP-027, updated by REP5-002]
  - MMMP to be developed in accordance with the Outline MMMP ([APP-249], updated by [REP4-054])
- marine ornithology (section 9.3.1 of RIAA Part 4 [APP-048, superseded by REP4-016]):
  - site selection and wind turbine design
  - restrictions on vessel traffic
  - a PEMP (see above).

In-combination effects

3.2.3 The projects assessed in the applicants' Stage 2 in-combination assessment at the point of DCO application were identified in the following sections of the RIAA:

- Annex I habitats [APP-046, superseded by REP4-014]:
  - Table 6-5 for Dogger Bank SAC;
  - section 6.5.2.2 for Flamborough Head SAC
  - section 6.6.2.2 for Humber Estuary SAC
- Annex II migratory fish [APP-046, superseded by REP4-014]:
  - section 7.4.2.2 for River Derwent
  - section 7.5.2. for Humber Estuary SAC
- Annex II marine mammals [APP-047, superseded by REP5-009]:
  - section 8.3.5.5 for SNS SAC
  - section 8.3.6.6 for Humber Estuary SAC
  - section 8.3.7.6 for the Wash and North Norfolk Coast SAC
  - section 8.3.8.6 for BNNC SAC
  - section 8.3.9.5 for Moray Firth SAC

3.2.4 With regards to marine ornithological features, the offshore wind farms (OWFs) assessed in the in-combination assessment for FFC SPA were

detailed in Tables 9-15, 9-16, 9-2, 9-24 and 9-30 of [APP-048]. For all other European sites for which a LSE was identified, detailed in-combination assessments identifying specific projects for inclusion were not presented. This was on the basis that there was no measurable increase in mortality from the project alone, therefore it would not contribute to in-combination effects. See section 3.8 below for more details.

3.2.5 An in-combination assessment was not provided in respect of terrestrial ecology in the RIAA Part 1 (section 5 of [APP-045, superseded by REP5-007]). The applicants confirmed [HRA.1.2, REP3-027] that following consultation with NE, it was agreed that there would be no impact on functionally linked land with the Humber Estuary SPA, and therefore there would be no potential for in-combination effects to occur (Section 5.4.2 of RIAA Part 1 refers). The applicants have confirmed [HRA.1.6, REP3-027] that the conclusions presented in Section 5.4 of RIAA Part 1 equally apply to the Humber Estuary Ramsar site.

3.2.6 Matters discussed during pre-examination and examination in relation to the in-combination assessment are detailed in sections 3.3 to 3.8 of this RIES.

Sites for which the applicants identified the <u>potential for AEoI</u>

3.2.7 The applicants concluded that the proposed development would result in AEoI on the following European sites and features, either alone or in combination with other projects or plans:

- Dogger Bank SAC:
  - sandbanks which are slightly covered by sea water all the time due to physical change (to another seabed type) (alone and in combination)
- FFC SPA:
  - guillemot (breeding) – disturbance and displacement (in combination)
  - kittiwake (breeding) – collision risk (in combination)

3.2.8 The above sites and features were therefore the subject of a derogation case produced by the applicants. See section 4 of this RIES.

3.2.9 In respect of kittiwake, the applicants were of the view that the in-combination collision impacts would not result in AEoI. However, they acknowledged previous decisions on OWFs by the SoS and the Crown Estate's Round 4 Plan Level HRA for the Fourth Offshore Wind Seabed Leasing Round which concluded there would be an AEoI due to the to the potential increase in mortality of FFC SPA breeding kittiwakes resulting from the operation of the Outer Dowsing and the Dogger Bank South OWFs. As such, the applicants agreed AEoI could not be excluded [APP-052, Section 9.5.2.2].

3.2.10 Whilst the applicants concluded AEoI on FFC SPA and Dogger Bank SAC for the qualifying features and LSE impact pathways detailed above, it did

exclude the potential for AEoI from other qualifying features and LSE impact pathways.

Sites for which the applicants concluded no AEoI

3.2.11 The applicants concluded that the proposed development would not adversely affect the integrity of all other European sites and features for which an LSE was identified (see Annex 1 of this RIES), either alone or in combination with other projects or plans.

3.2.12 Nevertheless, the applicants acknowledged that the SoS may be unable to reach the conclusion of no AEoI in respect of disturbance and displacement of razorbill of FFC SPA (alone and in-combination) and therefore included this feature in the derogation case on a without prejudice basis [APP-048, paragraph 276].

3.3 Pre-examination and examination matters – introduction

The applicants' initial conclusions in the RIAA were disputed by IPs and questioned by the ExA in respect of all receptor groups, as summarised below under the relevant headings. The ExA has noted where it understands that matters are resolved and included observations/ questions where matters are outstanding. Note that matters relating to semantics/ minor clarifications have not been included.

3.4 Terrestrial ecology and ornithology

3.4.1 NE [RR-039] and other IPs did not raise any specific disagreements with the applicants' conclusions on AEoI on sites designated for terrestrial ecology. However, NE and the ExA sought clarity on a number of matters in relation to the assessment of AEoI on the Humber Estuary SAC, SPA and Ramsar sites.

3.4.2 Further details are provided in Table 3.1 below.

Table 3.1: Terrestrial ecology – key issues raised in the examination to date by the ExA and IPs in relation to the applicants' assessment of effects on integrity (alone or in-combination)

ID	Issue	Details of issue	ExA observation/ question
Humber Estuary Ramsar			
3.1.1	Assessment of the qualifying features of the Humber Estuary Ramsar site	The ExA noted that the RIAA Part 1 [then APP-045, Section 5.4] listed and assessed impacts on the bird qualifying features of the Humber Estuary SPA but not those of the Humber Estuary Ramsar site. The applicants ([REP3-027] in response to [PD-014, HRA.1.6]) explained that the Humber Estuary Ramsar site covers the same geographic area as the Humber Estuary SPA and does not include any additional qualifying species not included in the Humber Estuary SPA designation. As such, they considered the conclusions presented in the RIAA Part 1 equally apply to the Humber Estuary Ramsar site.	The ExA notes the applicants' response.
3.1.2	Assessment of impacts to Natterjack toads	The Humber Estuary Ramsar Information Sheet includes natterjack toad. Natterjack toads have not been considered within either the HRA Screening [APP-049] or RIAA Part 1 [REP5-007]. NE and other IPs have not submitted any representations in relation to this species. Within its DL3 submission [REP3-059], NE included this on the list of qualifying features that it had an outstanding concern over, although no further information has been provided on the nature of the concern.	**RIES Q5: To NE: Can NE please provide details as to its concerns in relation to the assessment of natterjack toads of the Humber Estuary Ramsar site.**

ID	Issue	Details of issue	ExA observation/ question
Humber Estuary SAC, SPA and Ramsar			
3.1.3	Indirect effects on qualifying features of the Humber Estuary SPA and Ramsar site from impacts on benthic habitats	NE [REP3-059] [REP5-053] listed qualifying features of the Humber Estuary SPA and Ramsar site and noted these could be affected if the impacts on the benthic habitats of Humber Estuary SAC (and Spurn Point) as detailed in ID 3.4.1 of this RIES were not ruled out, although no further information has been provided in terms of how this could affect the SPA/ Ramsar site features. The applicants [REP4-088] confirmed they were undertaking modelling to demonstrate the limited effects that cable protection would have in the nearshore environment, including impacts on benthic habitats. A technical note detailing this modelling was provided [REP5-040], however it did not include specific reference to indirect impacts on SPA/ Ramsar site features.	**RIES Q6: To NE: Can NE please provide details as to the nature of its concerns, in terms of how impacts on benthic habitats could result in indirect effects on qualifying features of the Humber Estuary SPA and Ramsar site?**

3.5 Annex I habitats

3.5.1 NE agreed with the applicants' conclusion of AEoI for Dogger Bank SAC for sandbanks slightly covered by seawater all the time, as a result of physical change to another seabed/ sediment type [RR-039]. However, NE identified a number of site-specific concerns, predominantly in relation to the quantification of the effects from this pathway; these are detailed in Table 3.2 of this RIES.

3.5.2 NE [RR-039] did not agree with the applicants' conclusion of no AEoI for the following sites and qualifying features:

Dogger Bank SAC (see Table 3.2 below):

- sandbanks slightly covered by seawater all the time
  - from abrasion/ disturbance of the substrate on the surface of the seabed
  - from penetration and/ or disturbance of the substratum below the surface of the seabed, including abrasion
  - from habitat structure changes – removal of substratum (extraction)

Flamborough Head SAC (see Table 3.3 below):

- reefs
- vegetated sea cliffs of the Atlantic and Baltic coasts
- submerged or partially submerged sea caves
  - from smothering and siltation rate changes

Humber Estuary SAC (see Table 3.4 below)

- Atlantic salt meadows (Glauco-Puccinellietalia maritimae)
- estuaries
- mudflats and sandflats not covered by seawater at low tide
- Salicornia and other annuals colonising mud and sand
- sandbanks which are slightly covered by sea water all the time
  - from smothering and siltation rate changes (due to the use of cable protection interrupting longshore sediment transport)
  - from air quality changes during construction

3.5.3 NE also raised concerns around the potential for indirect effects (impacts on sandeel leading to impacts on the characteristic community and ecological function of Dogger Bank SAC), as detailed in Table 3.2.

3.5.4 Whilst not a specific dispute over the applicants' conclusion of no AEoI, NE also noted [REP3-059] that all qualifying features screened into the RIAA for the Humber Estuary SPA and Ramsar site could become of concern if impacts to the Humber Estuary SAC (and Spurn Point) cannot be ruled out.

3.5.5 Matters relating to the Humber Estuary SAC were also raised by East Riding of Yorkshire (ERYC) in its Local Impact Report (LIR) [PDC-007].

3.5.6 NE confirmed [REP3-057, HRA.1.7] that it agreed with the applicants' conclusion of no AEoI for all other sites (ie sites not identified in Table 5.1 of [RR-039]).

3.5.7 Matters relating to the conclusions of no AEoI from abrasion, penetration/ disturbance and habitat structure changes, and the scale of AEoI on the sandbanks slightly covered by seawater all the time feature of the Dogger Bank SAC were also raised in RRs from Lincolnshire Wildlife Trust (LWT) [RR-028], the Marine Management Organisation (MMO) [RR-030] and the Wildlife Trusts (TWT) [RR-057].

3.5.8 A RR was submitted by the Doggerland Foundation [AS-004] raising concerns relating to impacts on benthic habitats including the Dogger Bank SAC. Doggerland Foundation has not made any further submissions to the examination to date.

3.5.9 Further details are provided in Tables 3.2 to 3.5 below.

Table 3.2: Dogger Bank SAC - key issues raised in the examination to date by the ExA and IPs in relation to the applicants' assessment of effects on integrity (alone or in-combination)

ID	Issue	Details of issue	ExA observation/ question
3.2.1	Physical change to the seabed and sediment from the installation of infrastructure (above the seabed) (habitat loss) – interpretation of 'minimal'	The applicants' RIAA Part 2 [APP-046, section 6.4.2.6.1] calculated total habitat loss as 2.25km^2, equating to 0.018% of the area of the SAC. It stated that any loss in habitat for associated benthic communities would be minimal in the context of the remaining habitat still available. However, it concluded an AEoI on sandbanks as a result of physical change (to another seabed/ sediment type) from the proposed development alone or in combination with other projects. NE [RR-039, C36] acknowledged the spatial extent of the area impacted may be small relative to the SAC but did not agree habitat loss would be minimal, particularly when considering the many anthropogenic activities planned across the Dogger Bank SAC. It noted that the loss would equate to c.3050 football pitches from the proposed development alone which would be in addition to many existing or under construction anthropogenic activities. TWT [REP5-068] similarly did not believe the scale of the Dogger Bank SAC should minimise the significance of impacts upon its protected features. The applicants referred to [AS-025] for a discussion of small-scale losses. It confirmed in [AS-048] there would be an AEoI alone or in combination due to habitat loss. At DL4, the worst case area of permanent habitat loss within the SAC was revised down from the calculations made at application stage to 1.82km^2 (Revision 4 of the RIAA Part 4 [REP4-014, Table 6-3]) (primarily due to Change Request 1).	The ExA notes that this matter is colour coded purple by NE [REP5-061, C22].
3.2.2	Physical change to the seabed and sediment from the	NE [RR-039, NE4, NE6, B4, C6, C18] noted that the applicants had not considered the potential for changes to the physical and/ or biological structure and function beyond the footprint of the planned infrastructure (termed the ecological 'halo' effect). It stated that halo effects following the placement of structures on the	**RIES Q7: To NE: Can NE provide comment on the applicants**

ID	Issue	Details of issue	ExA observation/ question
	installation of infrastructure (above the seabed) (habitat loss) - ecological halo effects	seabed could result in broadscale changes in the benthic habitats and communities across a significant proportion of the SAC and that this could hinder the restoration objective. NE was also concerned that cable protection could modify the hydrodynamic regime and affect sediment transport pathways, contributing to the halo effect. It requested further mitigation measures to minimise these impacts. TWT [REP1-088] agreed halo effects should be considered. The applicants [AS-048] responded that there was no previous indication this was a matter of concern and considered it unreasonable to raise at this stage of the process. They disputed NE's evidence and stated that they had undertaken their assessment in line with best practice guidance, in consultation with relevant parties. The applicants considered evidence on halo effects to be equivocal at best and as such did not consider it appropriate to conclude AEoI. The applicants considered it would be more appropriate to use operational monitoring to investigate the effect and updated the In Principle Monitoring Plan, first at [REP2-043] and subsequently at [REP4-052] to reflect NE's advice. NE advised further on the post-construction monitoring in [REP5-055]. NE [REP2-065] acknowledged the term 'halo' had not been used during pre-application discussions but stated that the pathway is not new or unknown. NE acknowledged there are uncertainties over the scale and likelihood of this impact, but due to the location of the proposed development considered this should be robustly assessed and monitored. The applicants [REP3-028] [REP4-086] responded to explain where they had assessed the effects highlighted by NE. They confirmed that they had assumed 100% habitat loss (by a change to hard substrate) due to placement of monopile foundations, cable and scour protection (or up to this total if less scour protection is required, jackets are deployed etc). Furthermore, they noted that the 'Annex I sandbank' habitat encompassed a mosaic of different sandbank biotopes which are highly variable. They considered that halo effects are unlikely to be expressed in	**'Ecological Halo Effects Technical Note' [REP5-041]? Does NE consider the applicants' suggested methodology for quantifying ecological halo effects to be appropriate?** **RIES Q8: To NE: In its RR [RR-039, NE6, C6], NE refer to halo effects as habitat loss/ change. The Risk and Issues Log [REP5-061, D21] states that compensation measures for habitat disturbance should be provided, and infers that halo**

ID	Issue	Details of issue	ExA observation/ question
		dynamic environments such as the Dogger Bank, to such a degree that the change would represent a change from Annex I sandbank. They acknowledged there could be changes to biotopes as a result of this effect but stated that this would not represent a loss of extent of Annex I sandbank. NE [REP4-127] [REP5-055] continued to advise that halo effect should be factored into the predicted impacts. They noted that the applicants' response focussed on organic material and sediment type and did not consider changes to the characteristic benthic communities resulting from the placement of infrastructure. NE highlighted that the Supplementary Advice on the Conservation Objectives for the SAC for the Conservation Objective 'Biological Structure: Characteristic communities' states that "Characteristic communities are ones associated with established biological communities (biotopes) that form the feature", and therefore a change in biotope would represent the conservation objective being taken further away from its restore objective. It did not consider sufficient evidence had been provided to address its concerns. TWT [REP5-068] echoed NE's advice, stating that the major impacts of an ecological halo would be changes to the biological communities associated with the benthos which form part of the Annex I sandbank feature. It considered that new habitats associated with the sessile colonisers of hard substrate would represent a shift to a coastal habitat classification, which are habitat classifications not present in the Dogger Bank SAC due to the lack of hard substrate. It considered case studies of previous wind farms cited by the applicant are generally short term (2-4 years) and show a mixed range of results. Given the uncertainty surrounding halo effects and the restore objectives, TWT advised that a cautious buffer be included in calculations of physical change The applicants revised the RIAA Part 2 (Revision 4) [REP4-014] to include consideration of halo effects, concluding that that the 'halo effect' (if detectable) would not give rise to habitat loss additional to the loss from the installation of	**effects are the disturbance effects of concern. Can NE clarify whether it considers halo effects to represent permanent habitat loss or temporary habitat disturbance? (Please see also ID 3.2.9 of this RIES)**

ID	Issue	Details of issue	ExA observation/ question
		infrastructure. The applicants [REP4-088] considered that this detailed the worst case for disturbance effects and stated that the SoS would have information to determine the footprint contribution to AEoI; this encapsulated revisions to worst case parameters following Change Request 1, as well as due to the applicant's commitment to bundling of offshore export cables. In response, NE [REP5-055] advised that the assessment needed to be updated to consider the likelihood that scour protection could become colonised and contribute to halo effects, as well as to consider changes in predator-prey interactions. It considered that changes to biological structures within the Annex I sandbank could contribute to an AEoI. At DL5, the applicants submitted an 'Ecological Halo Effects Technical Note' [REP5-041] stating it has not been common practice to assess such effects on previous wind farms and that there is limited evidence of any significant effects of the kind described by NE. It reiterated the applicants' concerns on this matter being raised at the examination stage. However, it is also provided a methodology for determining the scale of effect, should it need to be quantified. In [REP5-037] the applicants reiterated that Dogger Bank is a mosaic of different types of sandbank biotopes and maintained that gross changes in biotopes are unlikely, and even if there is a change, this would not represent loss of Annex I habitat.	
3.2.3	Physical change to the seabed and sediment from the installation of infrastructure (above the	NE [RR-039, NE8, B11, C1, C11] stated that it was not clear where in Dogger Bank SAC cable protection may be required or why. NE noted the applicants had acknowledged an AEoI as a result of habitat loss, however it considered the methods and information used to determine the amount of cable protection and any associated lasting loss or change of Annex I sandbank habitat were neither comprehensive or transparent and that it is unclear how realistic the MDS was. It advised on the need to further quantify the impact.	**RIES Q9: To the applicants: The applicants confirmed a plan showing indicative remedial protection locations and**

ID	Issue	Details of issue	ExA observation/ question
	seabed) (habitat loss) – maximum Design Scenario (MDS) of scour and cable protection	NE advised the applicants to first attempt cable burial within Dogger Bank SAC. It requested a realistic Worse Case Scenario (WCS) of likely burial success, informed by geotechnical investigations, be provided and considered more fully in the Outline Cable Burial Risk Assessment within the Cable Statement [then APP-242]. The WCS should include any possible post-construction measures such as the placement of additional scour replenishment during operation and the implications of the removal and replacement of scour protection during cable repairs. It queried the need for cable protection within the SAC given that: Annex I sandbanks are not considered dynamic, therefore reducing the likelihood of cable exposure; as sandwave levelling is proposed to optimise cable burial; and there is a bottom-towed trawling ban within the SAC which would reduce snagging risk [REP5-062, MCP.2.10]. The applicants [AS-048] [REP1-049] [REP1-050] [REP4-088] [REP5-036, MCP.2.9] confirmed that the primary means of cable protection would be burial and that geotechnical site investigations indicate that the array areas should not present areas of burial challenges. However, the cable layouts had not been determined and they had therefore assessed a worst-case figure of 10% of the cable length within the SAC which required protection, which was aligned with the Round 4 Plan Level HRA. They confirmed that specific requirements for and locations of cable protection measures would be determined post-consent and informed by seabed mobility studies and would not exceed the worst-case values presented within the dDCO. The predicted final volumes, areas and locations would be included in the final Cable Statement(s) required by the dDMLs (in alignment with the Cable Statement [then AS-078]). They acknowledged that the 1.4m high cable protection could affect sediment transport but that, the sediment would first accumulate one or both sides up to the height of the cable protection, and then form a 'ramp' over which sediment transport would eventually occur, thereby bypassing the protection.	**protected site boundaries can be provided within an update to the Cable Statement at DL6 [REP5-036]. The ExA assume this is likely to mean it will be provided, but for the avoidance of doubt the ExA request that this is provided by the applicants within an update to the Cable Statement at DL6.** **RIES Q10: To NE: On the basis that the applicants are due to submit an updated Cable Statement at DL6, please confirm whether the**

ID	Issue	Details of issue	ExA observation/ question
		The applicants' Change Request 1 reduced the cabling within the array areas, plus associated seabed preparation and cable protection. NE [REP3-058] welcomed the reduction and noted that impacts from cable protection had been reduced but not removed. It still did not agree AEoI could be excluded alone or in-combination due to the lasting direct and indirect impacts from the placement of cable protection. The applicants [REP5-036, MCP.2.8] confirmed that Appendix F of Appendix B of the Cable Statement (Revision 4) [REP4-050] provided the locations and extents of areas preliminarily deemed to require cable protection. The applicants confirmed a plan showing indicative remedial protection locations and protected site boundaries can be provided within an update to the Cable Statement at DL6. The applicants noted [REP5-037, Table 2-17] the final cable protection locations will be presented within the final Cable Statement secured by condition 15(1)(i) of DML 1 within the dDCO [REP5-002]. In response to ExQ2 MCP 2.9 [PD-022], the applicants [REP5-036] reiterated their position that the amount of cable protection cannot be accurately predicted at this time. They emphasised the need for flexibility in the design of OWF projects and maintained that they had presented and assessed a WCS in line with the requirements of NPS EN-3 [REP5-036, MCP 2.8 and 2.9]. The applicants stated that the maximum cable protection took account of their previous experience of developing OWFs. The applicants stated that the Cable Statement [REP4-050] commits to the minimisation of cable protection where practicable, but that they cannot make reductions to the figures presented at the present time [REP5-036, MCP 2.9].	**updated document together with the applicants' responses to ExQ2 [REP5-036, MCP 2.8 and 2.9] address your concerns?**
3.2.4	Physical change to the seabed and sediment from the installation of infrastructure	NE [RR-039, NE2, A3, A19, A25, C12, C13] raised a concern that the dDCO did not contain an end date for deployment of cable and scour protection within designated sites. It noted that the Outline OOMP [then APP-248] and the ES Project Description Chapter [APP-071] identified cable protection to be placed over the proposed development's lifespan and requested a MDS including only cable/ scour protection anticipated to be installed during construction. It advised a	The ExA notes a further update on this matter will be provided by NE at DL6.

ID	Issue	Details of issue	ExA observation/ question
	(above the seabed) (habitat loss) – end date for cable and scour protection deployment	condition limiting the deployment of cable protection after completion of construction and that further cable/ scour protection would require a new marine licence. NE also sought clarity over what activities were and were not permitted through the dDCO and dDML through the OOMP in relation to cable protection over the lifetime of the proposed development. NE noted the potential for rock protection to become dispersed or lose integrity which could increase the footprint of habitat loss and/ or impacts to the structure and/ or function of the Annex I feature [REP2-065]. <u>Cable protection in areas previously not protected</u> The applicants [AS-048] [REP3-028] [REP4-086] [REP4-088] explained that the maximum design parameters reflect the levels of scour and cable protection that could be required during construction and operation. They initially agreed a separate marine licence would be required during operation for the deposit of new cable and scour protection in areas not previously protected as set out in the Outline OOMP [APP-248] (which NE concurred with [REP2-066]). However, they subsequently suggested that cable protection in new areas is pre-licenced in 10 year intervals throughout the operational stage, as the impacts had already been assessed and compensated for [REP4-086] [REP4-088]. The applicants agreed that further marine licences would be required should there be a need to exceed the limits established by the DCO [REP5-036, MCP.2.10]. However, they stated [REP5-036, MCP.2.10] that pre-licensed allowances for cable and scour protection already assessed were required to ensure the safe and continued operation of the proposed development. They noted that licensing every new deposit would be highly impractical with a lead in time of at least 12 months which could increase the likelihood of cable breakages, scour and foundation failure and would not deliver any appreciable environmental benefits. They noted that the dDML conditions (eg condition 22 in dDML 1 [REP5-002]) would ensure	

ID	Issue	Details of issue	ExA observation/ question
		the reporting of all new cable and scour deposits made by the projects during each year of operation. The MMO [REP5-049, MCP.2.10] stated that any new scour or cable protection (in areas where no such protection was employed during construction) must generally be consented through a separate marine licence and not through the OOMP. NE [REP5-062, MCP.2.10] [REP5-061] continued to disagree with the applicants' position, stating it is not in the spirit of the Strategic Compensation Strategy or Marine Recovery Fund (MRF) which requires the mitigation hierarchy to be fully adopted to avoid, reduce and mitigate impacts on designated sites. It confirmed it would update further at DL6 having met with the applicants on 8 May 2025 to discuss. <u>Cable protection replenishment</u> The applicants further explained [AS-048] [REP3-028] [REP4-086] [REP4-088] that they would not seek a new marine licence for any replacement protection required during operational phase in areas that were protected during construction. They considered that the amount of cable protection consented in the DCO is an allowance that can be used throughout the operational phase if it is within the footprint installed during construction. NE [REP2-066] considered it permissible to maintain existing protection placed during construction. The MMO [REP5-049, MCP.2.10] also considered it was generally only appropriate to licence at the outset of the project and that the scour and cable protection employed during construction could be maintained through the OOMP.	
3.2.5	Physical change to the seabed and sediment from the installation of	NE [RR-039, NE7, B3, B16, B37, C4, C43, C44] [REP1-063] [REP2-065] [REP3-058] [REP4-129] recommended that a commitment to remove all on and above seabed infrastructure associated with the development within benthic designated sites (excluding cable crossings) at the time of decommissioning should be secured in the dDCO. It noted this had been required for other wind farms consented in the	**RIES Q11: To the applicants: NE has provided a link to additional guidance relating**

ID	Issue	Details of issue	ExA observation/ question
	infrastructure (above the seabed) (habitat loss) – decommissioning of scour and cable protection	SAC due to its unfavourable condition and restore objective. In the absence of this commitment, NE considered that the presence of seabed infrastructure should be assessed on a permanent basis. NE also considered [RR-039, C44] that as the type of cable protection and method of decommissioning was not yet known, the effects required further assessment. The applicants [AS-048] [REP2-058] [REP3-028] [REP4-088] [REP5-037] did not consider that they could commit to decommissioning cable/ scour protection as technology and understanding of the impacts may change. They explained that they would consider the use of removable cable and scour protection measures during detailed design. They highlighted that post-consent controls would be in place which would allow NE the opportunity to scrutinise project proposals at the appropriate juncture. They considered that any compensation to be applied (see section 4 below) would be secured on a permanent basis, beyond the life of the proposed developments, thus compensating for any enduring effects of protection should any be left in situ. They stated that decommissioning would be determined as part of the decommissioning plan. The applicants further explained [REP4-086] that habitat loss impacts for previously consented projects had been considered temporary (albeit long-term), with the assumption that all infrastructure could be removed and recovery take place. However, as they did not consider that removal of all infrastructure could be guaranteed for the proposed development, the RIAA had assessed habitat loss as a permanent impact and concluded AEoI. NE [REP2-065] acknowledged that compensation would be provided for habitat loss from cable and scour protection. However, it highlighted the need to apply the mitigation hierarchy and avoid and reduce impacts as much as possible, even if compensation measures are being implemented. Furthermore, it cited other wind	**to decommissioning works [REP5-062]. Can the applicants confirm whether their current assessments and position on decommissioning complies with the advice of this guidance document? If not, can the applicants explain if and/ or how they intend to consider the advice of this guidance?**

ID	Issue	Details of issue	ExA observation/ question
		farms which require cable protection to be decommissioned even though compensation is being provided. At DL5, the applicants [REP5-036, BE.2.10 and MCP.2.1] considered their approach to decommissioning and the current assessments undertaken complied with relevant legislation, guidance and OWF precedents. NE [REP5-053] [REP5-062, BE.2.10 and MCP.2.10] similarly maintained its position that a commitment should be made to remove all on and above seabed infrastructure associated with the development within benthic designated sites (excluding cable crossings). It directed the ExA to government guidance 'Decommissioning of offshore renewable energy installations under the Energy Act 2004. Guidance notes for industry (England and Wales)' (2019).	
3.2.6	Physical change to the seabed and sediment from the installation of infrastructure (above the seabed) (habitat loss) – in-combination assessment	NE [RR-039, C34] disagreed with the applicants' approach to calculate an 'as built' estimate of habitat loss for consented projects within the SAC and advised that consented parameters should be used. The applicants [AS-048, page 101] explained that whilst built numbers had been identified, however the 11.71km^2 footprint was based on the consented footprint. NE [REP3-057] confirmed this matter to be resolved.	The ExA understands this matter to be resolved.
3.2.7	Abrasion/ disturbance of the seabed – timescales for recovery of	The RIAA Part 2 [then APP-046] identified the area of seabed to be disturbed by jack-up activities. It assessed the potential for AEoI from 'abrasion/ disturbance of the seabed'. Whilst it acknowledged the Round 4 Plan Level HRA had considered 'direct physical damage' as contributing to AEoI, it considered that the biotopes to be affected would rapidly recover from seabed disturbance which would be limited	**RIES Q12: To NE: Does NE agree with the applicants' calculations [REP5-037] that if these**

ID	Issue	Details of issue	ExA observation/ question
	Annex I sandbanks	in scale and temporary in nature. It concluded no AEoI from the proposed development alone or in combination with other plans or projects. NE [RR-039, C27, C49] did not agree with this conclusion, noting it was contrary to the Round 4 Plan Level HRA which stated recovery could be up to 25 years. NE advised that the anticipated disturbance footprint due to installation vessels could represent a considerable long-term change to seabed topography and the physical structure of the Dogger Bank SAC [RR-039, B39, B40, B47]. It noted that depressions from UXO detonation and jack up barges had not been assessed and could result in permanent habitat change or loss if in areas of coarse or mixed sediments [RR-039, C21 and C31]. NE [REP4-127] [REP5-055] consistently advised these impacts should be considered as permanent habitat change/ loss (rather than temporary disturbance or damage). TWT [RR-057] [REP1-088] [REP1-041] [REP4-072] echoed NE's comments regarding recovery periods and did not agree that impacts agreed in the Round 4 Plan Level HRA could be overturned by project level studies. The applicants [AS-048] [REP3-028] [REP4-088] explained that they had previously asked NE to provide evidence for its advice on recovery times but had not received a response. They considered that habitat damage was not adequately assessed within the Round 4 Plan Level HRA. They submitted a 'Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage' [AS-025] concluding that recovery time was possible within months to less than 4 years. They considered that the sandbank feature of the Dogger Bank SAC is no less recoverable than the sandbank features of other SACs and considered that SoS conclusions for previous projects (eg Hornsea Project 3, Norfolk Boreas and Norfolk Vanguard) were applicable. NE [REP2-065] [REP4-126] [REP4-128] did agree it is possible to supersede the Plan Level HRA with sufficient evidence but maintained its concerns. It advised that	**impacts were to be considered as permanent habitat loss, the total habitat loss would be 2.12km^2 (a 17% increase in footprint for habitat loss)?**

ID	Issue	Details of issue	ExA observation/ question
		whilst the applicants had evidenced that UXO craters have backfilled on other projects, this was not sufficient evidence to state that all aspects of habitat damage may be reversible. NE [AS-025] advised that the Dogger Bank SAC sandy mound sandbanks are unique and have limited recovery ability, and whilst there may be shorter recovery rates for specific biotopes, the full recovery of the whole site would be expected to be longer and would delay restoration of the SAC. NE further advised [REP3-057] that due to the uniqueness of Dogger Bank SAC it is challenging to demonstrate a small-scale loss and no AEoI. It stated that given the pre-existing impacts it is challenging for any impact not to be considered a material consideration in in-combination assessments. It did not consider the scale of impacts to be inconsequential to a SAC currently in unfavourable condition. The applicants revised the 'Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage' in [REP3-021]. They considered [REP3-027] [REP4-087] that NE's evidence was old; was in many cases meta analyses/ reviews; did not include evidence from offshore industry other than fisheries or aggregates; and was inconsistent with the MarESA Guidance Manual. They did not consider the underlying geology of Dogger Bank to be relevant to consideration of sandbanks; considered that any disturbance would be highly localised, episodic and short term; and highlighted that there is no clear understanding how the cessation of fishing will affect Dogger Bank. Revision 2 of 'Review of Evidence on Recovery of Sandbank Habitat Following Habitat Damage' [REP3-021] contained further details from the MarESA assessment. NE reviewed this document and noted in [REP4-127] that the updates did not address the impacts of depressions from UXO clearance or jack-up operations in areas of coarse or mixed sediments, which NE considered could remain for up to ten years.	

ID	Issue	Details of issue	ExA observation/ question
		TWT [REP3-069] were satisfied that NE had provided sources for a 10-25 year recovery time. They had little confidence in the applicants' studies showing rapid recovery of sandbanks. Furthermore, they did not agree with the applicants' interpretation of the MarESA assessment [REP5-068]. Both the applicants [AS-158] and NE [REP2-065] [REP3-057] [REP4-087] [REP4-088] acknowledged that it was unlikely agreement would be reached on the matter. The applicants [REP5-036, BE.2.4] [REP5-037] considered relevant evidence of recovery was provided in [REP3-021]. They confirmed that Revision 3 of the In Principle Monitoring Plan [REP4-052] included provision for pre- and post-construction geophysical surveys which would pick up any changes to the seabed profile. The applicants updated the RIAA Part 2 (Revision 4) [REP4-014] with areas of seabed disturbance from jack-up activities and identified the footprint of UXO clearance in [REP5-037]. They stated [REP5-037] that if these impacts were to be considered as permanent habitat loss, the total habitat loss would be 2.12km^2 (a 17% increase in footprint for habitat loss). They noted that "If the SoS concludes that habitat disturbance contributes to Adverse Effects on Integrity (AEoI) then the jacking-up footprint would be within the disturbance footprint and therefore already taken into account. Therefore, the footprint of jacking up should only be added to the permanent habitat loss footprint a) if SoS agrees that this is not a temporary disturbance impact and b) if the SoS agrees with the applicants that other construction disturbance is temporary and does not contribute to AEoI."	
3.2.8	Abrasion/ disturbance of the seabed – effects from placement of material	The RIAA Part 2 [then APP-046, section 6.4.2] assessed the potential for disturbance impacts from sediment removal and disposal during construction. It stated that any sediment removed from within the Dogger Bank SAC during construction activities would be disposed of within the SAC boundary, ensuring no sediment is lost from the sandbank habitat.	**RIES Q13: To the applicants: As requested by NE, the ExA strongly suggests the**

ID	Issue	Details of issue	ExA observation/ question
	disposal from dredging and drilling processes during construction	However, NE [RR-039, B65, C10, C35, C41, C56] [REP2-065] advised that the placement of drill arisings adjacent to turbines could result in further habitat loss/ change. It considered mitigation to be insufficient and advised on measures that could be adopted as follows: • All deposition of dredged sediment within the Dogger Bank SAC should be done via a fall pipe and adjacent and upstream of the dredge location in same sediment type (to ensure sediment stays within the site and enables sandwave recovery). • Drill arisings should be deposited with similar sediment characteristics ie not on sandbanks to avoid further habitat loss/ change. Similar comments were made by the MMO [RR-030]. <u>Fall pipes</u> The applicants [AS-155] [REP3-028] noted that fall pipes are normally found on rock installation vessels and not dredgers. They were not aware of vessels that would meet this requirement and therefore did not consider it technically feasible. The applicants [AS-155] [REP3-028, B45] confirmed that bottom deposition/ open door disposal was its preferred method, which had been assessed within the WCS. NE [REP2-065] [REP4-126] [REP4-129] [REP5-054] noted that Five Estuaries and Outer Dowsing OWFs had committed to using a downpipe measure and therefore there is an expectation it is deliverable for all projects. The applicants disputed that ODOWF had made this commitment and requested evidence from NE of the existence of suitable vessels with fall pipes; it would not commit to mitigation it did not believe to be technically feasible [REP5-037] [REP5-036, MCP.2.7]. NE did not give specific vessel types [REP5-032, MCP.2.6], however reiterated that it was possible given the commitment to do so on other OWF projects. NE considered	**applicants update the Commitments Register [REP2-025] to include the agreed mitigation of depositing like sediment on like sediment (as committed to in the Cable Statement [REP4-050]).** **RIES Q14: To the applicants: As requested by NE, can the applicants update the Cable Statement [REP4-050] to secure provision of an outline sandwave levelling, deposition and recovery plan, should sandwave levelling be needed?**

ID	Issue	Details of issue	ExA observation/ question
		that whilst the details of this could be agreed post-consent, the commitment to do so should be secured in the examination. 'Like' sediment The applicants initially stated it would initially be difficult to deposit on like sediment [AS-048] [AS-155] [PDA-013] [REP3-028]. However, further to comments from NE [REP2-065], they committed to this measure in Revision 4 of the Cable Statement [REP4-050]. This also included the commitment to dispose of material removed from Dogger Bank SAC within that part of the Dogger Bank SAC which falls within the Order Limits. This was welcomed by NE, who advised [REP5-061, B45, C21 and C34] [REP5-054] the commitment also be included in the Commitments Register [REP2-025]. NE also suggested further mitigation measures to reduce impacts in [REP5-054, Table 3]; requested updates to the Cable Statement to secure the provision of an outline sandwave levelling, deposition and recovery plan (should sandwave levelling be needed); and requested pre and post construction monitoring [REP5-054]. The applicants [REP3-028] also stated that drill arisings would be located adjacent to turbine foundations and within the scour protection footprint so would be captured within the existing habitat loss estimates. They confirmed that the In Principle Monitoring Plan (Revision 3) [REP4-052, Table 1-3] included additional detail with regards to monitoring of drill arisings. NE [REP5-061, C25] queried the feasibility of placing drill arisings adjacent to turbines and whether it can be guaranteed they would be within the footprint of any scour protection. If within the scour footprint, NE stated that it compromises the applicants' commitments to only utilise removable material. It queried what would happen if drill arisings were to move into surrounding Annex I sandbanks. The applicants [REP5-037] explained that the drilling platform would sit on top of the monopile being installed, as drilling progresses the arising would be discharged	**RIES Q15: To the applicants and NE: NE has suggested further mitigation measures to reduce impacts of depositing sediment. Is the applicant willing to commit to these measures?** **Does NE consider these measures (and the need for a downpipe) are required in order to exclude AEoI from this LSE pathway?** **RIES Q16: To NE: The applicants have provided information [REP5-037] in relation to the placement and retention of drill**

ID	Issue	Details of issue	ExA observation/ question
		into the sea as part of the drilling process, remaining in close proximity to the drilling location whilst minimising interference with any pre-installed scour protection or planned cable corridors.	**arisings in close proximity to drilling locations. Is this information sufficient to address your concerns on this matter?**
3.2.9	Abrasion/ disturbance of the seabed – impact figures and conclusions	NE [RR-039, C49] [REP5-061, C16, D21] considered that an AEoI would result from abrasion/ disturbance of the seabed within Dogger Bank SAC. It noted that this impact was referred to in the strategic compensation plan [APP-060] and considered that compensation was required for this impact. Revision 4 of the RIAA Part 2 [REP4-014, Table 6-3] identified the total area of disturbance within Dogger Bank SAC as 25.02km^2. However, in [REP4-086] the applicants explained that 2km^2 habitat loss would need to be compensated for, but this would rise to 30km^2 if disturbance is concluded to contribute to AEoI.	**RIES Q17: To the applicants: Can the applicants clarify the habitat disturbance footprint as the figures in [REP4-014, Table 6-3] do not accord with those in [REP4-086]?** **RIES Q18: To NE: Noting that NE consider jack up activities and UXO clearance to represent permanent habitat**

ID	Issue	Details of issue	ExA observation/ question
			loss and contribute to AEoI for habitat loss, can it confirm the basis upon which it considers there to be an AEoI from abrasion/ disturbance?
3.2.10	Changes to wave and tidal regime	NE [RR-039, B29, B30, B43] stated that changes to wave energy and tidal regimes from the presence of infrastructure could affect bedload sediment transport and seabed morphology (and in turn the biological communities) of Dogger Bank SAC. It advised that the implications of predicted changes to current speeds and bed shear stress over the lifespan of the proposed development needed to be fully considered in terms of seabed sediment composition, sediment mobility, and seabed morphology of the Dogger Bank SAC. The applicants [AS-048] responded that the footprint of blockage effects from changes to waves heights would be insignificant compared to the area of the SAC, and any changes to the tidal regime would be negligible. They updated the Marine Physical Processes Modelling [REP2-018] to reflect Change Request 1 and NE's advice. They ultimately considered that the predicted changes in wave regime would not hinder the conservation objectives of the SAC [REP4-088]. However, NE [REP3-058] [REP4-122] [REP4-129] [REP5-061, B18 and B19] advised an assessment of wave shadow effects due to waves approaching from the south/ southwest and cumulative effects with nearby OWFs and the predicted changes in tidal current speeds be further assessed. NE [REP5-062, MCP.2.3] [REP5-061, B18 and B19] maintained its position that a further assessment is required and provided information on the evidence it	**RIES Q19: To the applicants: NE has provided [REP5-061] [REP5-062] a list of outstanding elements of its previous advice that it considered should be addressed in relation to changes to the wave and tidal regime throughout the operational lifespan of the proposed development. Can the applicants**

ID	Issue	Details of issue	ExA observation/ question
		considered would be required for the assessment of changes to the wave and tidal regime.	**submit this information at DL7? If not, why not?** **RIES Q20: To NE: Can NE confirm the LSE pathway that changes to wave and tidal regime relate to?**
3.2.11	Indirect effects (impacts on sandeel leading to impacts on the characteristic community and ecological function of Dogger Bank SAC)	NE raised various concerns in its RR regarding impacts on the Dogger Bank sandeel populations, including: • that the full scale of potential spawning habitat and/ or change had not been assessed [RR-039, NE11, E3] • that habitat loss from UXO clearance had not been assessed [RR-039, E19] • appropriateness of the data utilised in the impact assessment [RR-039, E13] • that the lack of commitment to remove all on and above seabed infrastructure at the point of decommissioning would lead to permanent impacts on spawning areas [RR-039, E31] • cumulative impacts on spawning habitat, including from ECCs [RR-039, E36]	**RIES Q21: To the applicants: NE has provided [REP5-056] a list of outstanding elements of its previous advice that it considered should be addressed in relation to localised impacts on sandeel (and herring). Can the applicants submit this information at**

ID	Issue	Details of issue	ExA observation/ question
		• need for additional cable protection mitigation to reduce impacts to spawning habitat [RR-039, E30] • need for longer-term monitoring of impacts [RR-039, E40] NE [RR-039, E43 and Annex E1] considered that should impacts to sandeel contribute to an AEoI for the Annex I sandbank qualifying feature, consideration of spawning habitat may need to be incorporated into compensation measures for the Dogger Bank SAC. Whilst the applicants had included consideration of sandeel as a component of the Dogger Bank SAC in [APP-050], NE was unable to advise that impacts on the characteristic community and ecological function which are key attributes of Dogger Bank SAC through impacts to sandeel could be excluded. NE highlighted [RR-039, E3] that taking the proposed development into account, a significant proportion (34.85%) of high potential sandeel spawning habitat within Dogger Bank SAC had been calculated to be within OWF array areas in the in-combination assessment. NE also considered that as the applicants had not committed to removal of cable/ scour protection at end of life, there would be no ability for populations to recover. NE also noted potential for changes resulting from ecological halo effects and 'reef effects' which could potentially affect sandeel populations [RR-039, Annex E1]. NE's view was that whilst uncertainty around the potential impacts remained, it was not possible to advise beyond reasonable scientific doubt that impacts on sandeel as a contributing factor to the AEoI conclusions for Dogger Bank SAC could be excluded [RR-039, Annex E1]. This was presented in NE's Risk and Issues Log [REP5-061, E23] as a 'purple' issue (note for Examiners and/ or competent authority) and NE has not (to date) added further comment to the Log. A response was not provided on this specific point by the applicants in [AS-048]. LWT [RR-028] and TWT [REP1-088] also raised concerns regarding impacts to sandeels. The MMO [RR-030] [REP2-063] deferred to NE in relation to designated	**DL7? If not, why not?** **RIES Q22: To the applicants and NE: Please provide your current views on whether impacts on sandeel can be excluded as a contributing factor to the AEoI conclusions for Dogger Bank SAC.**

ID	Issue	Details of issue	ExA observation/ question
		sites but provided comment on matters such as mitigation and monitoring for sandeel. This RIES has not sought to document and signpost all information in relation to potential effects on the sandeel populations of Dogger Bank SAC (noting that these are not a qualifying feature of the site) but provides the following broad summary of discussions: • The applicants stated [AS-048, E3] that assuming a WCS in which all permanent habitat loss associated with the development falls within areas of high potential sandeel habitat, this would result in a loss of 0.0008% of the high sandeel potential habitat within the Dogger Bank SAC (5049.7km^2). • The applicants presented revised sandeel potential habitat within the Heat Mapping Report [AS-105] (reviewed by NE in [REP3-053]). The applicants stated that they had assumed that potential for sandeel spawning equals presence, had used the worst-case in terms of footprint of impact and therefore had been precautionary in the assessment [REP4-086]. • As requested by NE [REP3-058], following Change Request 1, the applicants provided revised percentages for habitat loss within the Dogger Bank SAC, broken down by heat scores [REP4-088]. • The applicants [REP4-096] signposted to RIAA Appendix B [APP-050] for detail on the importance of sandeel in the Dogger Bank SAC (and Southern North Sea SAC) and the assessment of loss of potential sandeel habitat within these sites. The applicants stated that permanent habitat loss covers the loss of sandeel spawning grounds	

ID	Issue	Details of issue	ExA observation/ question
		and therefore loss of sandeel spawning grounds contributes to the conclusion of AEoI for Dogger Bank SAC. • At DL4, NE [REP4-126] did not consider that the WCS of permanent impacts to spawning grounds from infrastructure being left in situ had been assessed. NE maintained that the applicants should commit to not installing cable protection within areas of high - very high potential spawning habitat, and that clarity was needed on how localised impacts on high potential spawning habitat loss due to cable protection have been assessed [REP4-126]. • In response to ExQ2 FSE.2.12 [PD-022], the applicants [REP5-036, Appendix B] and NE [REP5-056] summarised their latest positions on potential impacts to sandeel. • NE continued to disagree with the applicants' conclusion that impacts on sandeel are low to negligible [REP5-056]. NE reiterated that sandeel form part of the characteristic communities relevant to the biological structure and function in certain areas of the Dogger Bank SAC, with reference to 'Supplementary Advice on Conservation Objectives for Dogger Bank SAC' (JNCC, 2022) [REP5-056]. NE provided [REP5-056] a list of outstanding elements of its previous advice that it considered should be addressed in relation to localised impacts on sandeel.	
3.2.12	Changes in suspended solids (water clarity) - worst-case suspended	NE [RR-039, C33] noted that the WCS of suspended sediment concentration from trenching activities was inconsistent between the RIAA and Environmental Impact Assessment (EIA) documents. The applicants [AS-048] noted that the EIA and HRA assessments covered different geographic areas (SAC and the entire cable corridor), however did identify minor corrections to the ES and RIAA which it did	The ExA understands this matter to be resolved pending the updates proposed to

ID	Issue	Details of issue	ExA observation/ question
	sediment concentrations	not consider would alter the RIAA assessment conclusions. The updated RIAA Part 2 was provided as [REP4-014]. NE [REP5-061, C19] noted the amendments to the RIAA and that the matter had been progressed, however it considered the matter could not be fully resolved until all relevant documents had been amended.	be submitted by the applicants at DL7.

Table 3.3: Flamborough Head SAC - key issues raised in the examination to date by the ExA and IPs in relation to the applicants' assessment of effects on integrity (alone or in-combination)

ID	Issue	Details of issue	ExA observation/ question
3.3.1	Lack of sufficient evidence relating to the baseline (sensitivity of biotopes) to allow for a robust assessment of potential impacts to the Flamborough Head SAC from smothering and siltation rate changes (heavy and light)	NE [RR-039, C5, C7, C15, C19, C25, C38, C47] was not satisfied that an AEoI alone or in-combination could be excluded for the Annex I habitat features from the pathway of smothering and siltation rate changes (heavy and light), as it considered there was a lack of sufficient evidence relating to the baseline (sensitivity of biotopes) to allow for a robust assessment. The applicants responded [AS-048, C5] to state that Flamborough Head SAC is located approximately 3km from the Offshore ECC and that there was no pathway for direct impact. As such, no baseline survey was considered necessary by the applicants and existing information from NE was used as the baseline. The applicants considered that the RIAA detailed how either communities typically associated with the type of reef habitat are known to be tolerant of light increases in sediment smothering; or for sea caves, the biotopes are at a maximum of medium sensitivity to smothering and siltation rate changes, and based on the anticipated sediment regime, no heavy smothering and siltation rate changes would occur. The applicants considered [AS-048, C7, C19] that the value of the habitats and receptor sensitivity had been taken into account in the RIAA [APP-046]. The applicants submitted a 'Benthic Ecology Technical Note' [AS-104] to provide the further detail requested by NE [RR-039, C15, C38], including biotope sensitivity and assessment of construction and operational impacts. In response, NE [REP2-065] indicated that it was still not in agreement with the classification of the sensitivity of receptors. The applicants [REP3-028] [REP4-088] provided further methodological detail, including within in an updated version of the 'Benthic Ecology Technical Note' ([REP3-025], superseding [AS-104]). The applicants also confirmed the anticipated	The ExA understands this matter to be resolved in terms of agreement on the conclusion of no AEoI of Flamborough Head SAC.

ID	Issue	Details of issue	ExA observation/ question
		WCS of cable repairs and burials [REP4-088, Appendix A], following a request from NE [REP3-058]. In response to ExQ1 [PD-014, BE.1.16], the applicants [REP3-027] [REP4-087] and NE [REP3-057] stated that they were close to agreement on this matter. The applicants updated the RIAA Part 2 [REP4-014] to include references to the updated assessments and to explain that there would be no interaction of concern between the vegetated sea cliffs of the Atlantic and Baltic Coasts and construction of the Offshore ECC. NE confirmed agreement that there was no interaction of concern [REP5-055] [REP5-062]. Following the amendments to the RIAA Part 2 [REP4-014] and information provided in [REP3-025], NE confirmed that it was in agreement with the applicants' conclusions of no AEoI of all Annex I habitat features of the Flamborough Head SAC [REP5-053] [REP5-062, BE.2.6].	

Table 3.4: Humber Estuary SAC - key issues raised in the examination to date by the ExA and IPs in relation to the applicants' assessment of effects on integrity (alone or in-combination)

ID	Issue	Details of issue	ExA observation/ question
3.4.1	Nearshore cable protection potentially causing smothering and siltation rate changes (heavy and light)	The applicants assessed impacts on sediment transportation processes under the heading of "Smothering and siltation rate changes". NE raised concerns [RR-039, NE3, B2, B35, B50] over the presence of cable protection in the nearshore environment having potential to disrupt longshore sediment transport, and subsequently impact on benthic habitats of the Humber Estuary SAC. NE was not satisfied that an AEoI alone or in-combination could be excluded due to the draft condition allowing 10% of the export cable to be protected from 350m seaward of Mean Low Water Springs (MLWS) to the 10m depth contour [RR-039, B50]. NE advised additional information was needed to demonstrate this was necessary and that additional methods should be explored, or the maximum height of any protrusions be reduced [RR-039, B35]. NE was also concerned that the use of cable protection within the 10m depth contour would interrupt the longshore sediment transport supply to the Humber Estuary SAC (and Spurn Point) [RR-039, B50]. In response, the applicants [AS-048] provided justification relating to burial and landfall locations and for 10% of cumulative cable length being subject to cable protection. Within the 10m depth contour, the applicants would be limited to a cable protection height of no greater than 50cm (by the conditions of the dDMLs). Therefore, rock placement would not be used within the 10m depth contour, with other design solutions (such as concrete mattresses) being required should a need for cable protection measures be identified in the final design of the proposed development. NE continued to disagree with the applicants' conclusions of no AEoI [REP1-067] [AS-161] and provided Appendix B2 with further details [REP2-064], noting that whilst	**RIES Q23: To NE: Please provide comments for DL7 on the applicants' technical note 'Assessment of Coastal Processes at the Dogger Bank South Landfall' [REP5-040].** **RIES Q24: To NE: Please also confirm your latest position on whether AEoI on benthic habitat features of the Humber Estuary SAC can be excluded in relation to**

ID	Issue	Details of issue	ExA observation/ question
		it welcomed the applicants' commitment to the separate bundling of pairs of the export cables outlined in the updated Cable Statement [then AS-079], this had not been secured in the dDCO and updated cable protection estimates and assessments had not been provided. NE also considered that the agreement to avoid rock placement within the 10m depth contour was not secured and that no evidence had been provided to demonstrate that cable protection up to 50cm in height would not disrupt longshore sediment transport towards the SAC. The applicants responded [REP3-028] confirming how they considered the rock placement restrictions had been secured. They provided information on the nature of sediment transport in the area and distance between the Humber Estuary SAC and the cable landfall point, including in response [REP3-027] to ExQ1 [PD-014, MCP.1.3]. At DL3, NE advised [REP3-060] amendments to the Cable Statement [REP2-039] may progress the matter and the applicants [REP3-028] provided initial calculations of anticipated cable protection volumes (116m of cable). [REP3-059] confirmed that NE was still not in agreement with the conclusions of no AEoI on the Humber Estuary SAC. The matter was further explored at ISH5 ([REP4-086] refers). The applicants agreed with NE that landfall impacts had not been thoroughly assessed in the 'Benthic Ecology Technical Note' [REP3-025] following the removal of an intertidal punchout at landfall as included in Change Request 1. Further detail was given on the applicants' position and proposed additional evidence (provision of a technical note at DL5) in response to the ISH5 action points [REP4-096]. The applicants [REP4-086] made a commitment in relation to cable protection and cable bundling within the Cable Statement [REP2-039] which is a document secured in the dDMLs [REP5-002]. The applicants highlighted the small scale of any	**changes to smothering and siltation rates.**

ID	Issue	Details of issue	ExA observation/ question
		protection inside the 10m depth contour even in a worst-case and reiterated that the protection would lie over 40km away from the area NE suggest could be impacted. The applicants confirmed the anticipated WCS of cable repairs and burials [REP4-088, appendix A]. NE [REP4-129, B23] and [REP4-122] welcomed the details of cable protection, however repeated its recommendation for additional security of these measures. NE maintained its overall position in disagreement with the applicants' conclusions of no AEoI [REP4-126]. The applicants updated the RIAA Part 2 [REP4-014] confirming removal of the short trenchless crossing at landfall, avoiding the need for exit pits in the intertidal area. The applicants consider there is no longer any pathway for effect for sediment transport resulting from construction works in the intertidal environment. The applicants highlighted relevant mitigation commitments [REP5-036, HRA.2.7] and provided additional information (further to that given in [REP3-028]) on the extent of cable protection measures and how this would be secured [REP5-037, Table 2-17 entry B5]. They maintained their position of no AEoI on the habitats of the Humber Estuary SAC ([REP5-036, BE.2.9] (marked as BE.2.8 by the applicants) and [REP5-037, B23)). To further support their position, the applicants provided a technical note 'Assessment of Coastal Processes at the Dogger Bank South Landfall' [REP5-040]. NE maintained its position of disagreement with the applicants' conclusions of no AEoI on the Humber Estuary SAC at DL5, stating that it required additional information on potential disruption of sediment transport [REP5-053] [REP5-061, B23]. NE confirmed [REP5-053] [REP5-062, BE.2.8 and BE.2.9] that further comments would be provided following submission of the technical note [REP5-040].	

ID	Issue	Details of issue	ExA observation/ question
3.4.2	Screened in impacts omitted from RIAA	NE noted [RR-039, B46] that several qualifying features of the Humber Estuary SAC which were screened into the assessment in [APP-049] were not presented in the RIAA [then APP-046] – specifically: coastal lagoons; estuaries; Salicornia and other annuals colonising mud and sand; and Atlantic salt meadows. The applicants [AS-048] acknowledged that the qualifying features were omitted and provided a summary assessment for the pathways of siltation changes and introduction of other substances. The RIAA Part 2 was updated with these assessments [REP4-014] and to refer to the design changes associated with Change Request 1. NE confirmed [REP5-061, B32] that the applicants had screened in all relevant features for the Humber Estuary SAC in the updated RIAA Part 2 [REP4-014].	The ExA understands this matter to be resolved.
3.4.3	Air quality impacts due to construction traffic	The applicants addressed air quality impacts (nitrogen oxides (NO_x) and ammonia (NH_3)) from construction road traffic related under the heading of 'the introduction of other substances (solid, liquid or gas)' in RIAA Part 2 (then [APP-046], section 6.6.2.2.1). This assessed the potential impacts of NO_x and NH_3 on the mudflat and sandflat habitat not covered by seawater at low tide. ES Chapter 26 Air Quality [APP-208, section 26.4.3.3.7] explained that the thresholds for road traffic flow increases, above which detailed assessment at nearby designated sites would be required, were based on JNCC guidance. NE [RR-039, NE21, I1, I6] advised that the assessment of air quality impacts to internationally designated sites should be undertaken using the thresholds included in NE's published guidance document, NEA001. The applicants responded with 'Technical note: Comparison of Approaches using the NE Guidance NEA001 and JNCC Guidance' (for NE RR Appendix I1) [AS-048, Annex A] to describe the methodology used for road traffic emissions dispersion modelling and to compare the NEA001 and JNCC approaches. It concluded that:	The ExA understands this matter to be agreed with NE. **RIES Q25: To NE: The ExA notes that NE's concerns were reported for the Humber Estuary SPA, SAC and Ramsar site in [RR-039]. However, further to examination**

ID	Issue	Details of issue	ExA observation/ question
		(i) For the assessment of NO_x, the JNCC approach predicted higher concentrations than the NEA001 dispersion model approach. (ii) For NH_3, the NEA001 dispersion model approach found the potential for significant effects (whereas the JNCC approach did not), but that this would be minor adverse and therefore not significant. The applicants updated RIAA Part 2 accordingly (then Revision 3 [AS-051], now Revision 4 [REP4-014]). NE subsequently concurred with the conclusion of no AEoI [REP1-066] [REP4-129].	**submissions, the ExA understands the air quality concerns relate solely to Annex I habitats of the Humber Estuary SAC. The ExA requests confirmation from NE as to whether this assumption is correct. If it is not correct, NE is requested to clarify the sites and features which the air quality concerns relate to.** **RIES Q26: To ERYC: ERYC's LIR [PDC-007] raised a number of points in**

ID	Issue	Details of issue	ExA observation/ question
			relation to air quality impacts on the Humber Estuary SAC, SPA and Ramsar site. Can ERYC confirm, with supporting reasoning, whether it has any outstanding concerns regarding air quality impacts on these sites?
3.4.4	In-combination effects on benthic habitat qualifying features	ES Figure 16-2 [REP3-014] illustrates the location of the proposed development relative to other OWFs, including the proposed Dogger Bank D OWF array (the proposed export cable route for Dogger Bank D OWF is not shown). NE [RR-039, B48] stated that Dogger Bank D OWF should be included in the in-combination assessment for the Humber Estuary SAC, noting that the project had recently completed a revised EIA scoping and as such some information was available publicly. The applicants [AS-048] consider there is insufficient information at this stage to include Dogger Bank D OWF in its cumulative/ in-combination assessments for the Humber Estuary SAC. Instead, the applicants [REP3-027] consider that it would fall to Dogger Bank D OWF's HRA to consider Dogger Bank South OWFs within its cumulative/ in-combination assessments, due to the timescales of available	**RIES Q27: To the applicants: The applicants are requested to provide an update to their assessments once Dogger Bank D's PEIR is publicised. On the basis that this is on or**

ID	Issue	Details of issue	ExA observation/ question
		information. The applicants gave examples where this approach has been used on other HRA documents for consented wind farms. NE noted [REP4-129, B33] that Dogger Bank D OWF's section 42 consultation (and PEIR publication) is expected 6 June 2025 – 1 August 2025. At the time of publication of this RIES, the applicants had not provided cumulative/ in-combination effects assessments to include Dogger Bank D OWF. NE maintained its position that Dogger Bank D OWF should be included in the in-combination assessment for the Humber Estuary SAC at DL5 [REP5-061, B33].	**shortly after 6 June 2025, the revised assessment should be submitted alongside comments on the RIES for DL7. An updated version of ES Figure 16-2 [REP3-014] showing Dogger Bank D OWF including its export cable corridor, should also be provided.**

Table 3.5: General

ID	Issue	Details of issue	ExA observation/ question
3.5.1	Cable burials and repairs	NE [RR-039, B13] noted that the operational activity of 'cable repairs and reburial' had been described, but no associated LSE pathways were assessed. It requested the WCS impact on each Marine Protected Area.	The ExA notes that updates to examination

ID	Issue	Details of issue	ExA observation/ question
		The applicants provided the WCS volume of sediment displacement during operation in [AS-141], which it subsequently revised to reflect impacts on Dogger Bank SAC, Flamborough Head SAC and Humber Estuary SAC in [REP4-088, Appendix A]. NE [REP5-061, B5] acknowledged the information provided in [REP4-088] and understood that this was to be included within upcoming updates to examination documents proposed for DL7.	documents are proposed for DL7.

3.6 Annex II migratory fish

3.6.1 In its RR [RR-039, Table 5.1], NE stated that it did not agree with the applicants' conclusion of no AEoI for:

- Humber Estuary SAC and Humber Estuary Ramsar site:
  - sea lamprey
  - river lamprey

3.6.2 NE confirmed [REP3-057, HRA.1.7] that it agreed with the applicants' conclusion of no AEoI for all other sites (ie sites not identified in Table 5.1 of [RR-039]).

Table 3.6: Annex II migratory fish – key issues raised in the examination to date by the ExA and IPs in relation to the applicants' assessment of effects on integrity (alone or in-combination)

ID	Issue	Details of issue	ExA observation/ question
Humber Estuary SAC and Humber Estuary Ramsar site - sea lamprey and river lamprey			
3.6.1	Indirect impacts through effects on preferred prey availability	As noted in section 2.6 above, this LSE pathway has been considered by the ExA in section 3 of this RIES on a precautionary basis. In response to NE's concerns, the applicants [AS-048, REP2-058] have stated that given the wide range of prey types, determining any source-pathway-receptor relationship specific to the proposed development is not possible for either river lamprey or sea lamprey. The applicants [AS-048, REP2-058] consider that the conclusions of no significant effect on fish species reached in ES Chapter 10 Fish and Shellfish Ecology [APP-091] can be used as the basis to determine that there is no potential for impacts to preferred prey availability. The applicants have therefore not presented information specifically in relation to the assessment of effects on the integrity of sea lamprey and river lamprey of the Humber Estuary SAC and Ramsar site, including whether there are any implications on the conservation objectives of these sites. NE has acknowledged that the uncertainties and data poor environment would prevent a reliable assessment being made [REP3-059, REP4-129]. The ExA also notes that sea lamprey and river lamprey of the Humber Estuary SAC and Ramsar site are no longer identified as features for which NE has outstanding concerns in terms of potential AEoI [REP3-059] [REP5-053].	Notwithstanding the concerns NE has flagged, it appears that NE no longer considers that AEoI would arise for these features from this pathway.

3.6.2	Mitigation for underwater noise	The RIAA Part 2 [REP4-014, Table 7-2] describes 'Use of low-yield methods would be utilised for the detonation of UXO where viable', as an embedded mitigation measure relating to Annex II migratory fish. The Outline MMMP [REP4-054] states low-order clearance is the default option for UXO clearance, but that some high-order detonation may need to be undertaken. In response to ExQ2 [FSE.2.16, PD-022], the applicants confirmed [REP5-036] that the conclusions of no AEoI for Annex II migratory fish presented in the RIAA Part 2 [REP4-014] were not reliant on use of low-yield methods for the detonation of UXO. The applicants explained [REP5-036] that the assessment was based on a worst-case of high-order clearance.	The ExA understands this matter to be resolved.

3.7 Annex II marine mammals

3.7.1 In its RR, NE [RR-039] raised concerns around:

- behavioural impacts on grey seal and harbour porpoise resulting from underwater noise and the applicants' proposals for mitigation, including the MMMP and SIP
- indirect effects on harbour porpoise of the SNS SAC from impacts on forage fish prey species
- the applicants having scoped out permanent auditory injury (PTS) from the cumulative and in-combination assessments

3.7.2 NE therefore did not agree with the applicants' conclusion of no AEoI for the following sites [RR-039, Table 5.1]:

- BNNC SAC, Humber Estuary SAC and Humber Estuary Ramsar site:
  - grey seal
- SNS SAC:
  - harbour porpoise

3.7.3 Further details are provided in Table 3.7 below.

3.7.4 NE confirmed [REP3-057, HRA.1.7] that it agreed with the applicants' conclusion of no AEoI for all other sites (ie sites not identified in Table 5.1 of [RR-039]).

Table 3.7: Marine mammals – key issues raised in the examination to date by the ExA and IPs in relation to the applicants' assessment of effects on integrity (alone or in-combination)

ID	Issue	Details of issue	ExA observation/ question
Sites with Annex II marine mammal qualifying features			
3.7.1	Scoping out of permanent auditory injury (PTS) from the cumulative and in-combination assessments	NE [RR-039, F16, F29] did not agree with the applicants scoping out PTS from the cumulative and in-combination assessments and advised that it should be screened in. NE did not agree that the mitigation outlined in the Outline MMMP and ES was sufficient to minimise the risk of injury for all PTS impact ranges (13km for harbour porpoise) [RR-039, F16]. Additionally, NE considered that although other projects would use mitigation measures to reduce the risk of injury on marine mammals, mitigation could not guarantee that no animals would be at risk of PTS and therefore, PTS should be screened into the cumulative effects assessment (CEA) and in-combination assessment [RR-039, F16]. The applicants responded [AS-048, p163] that all projects are required to mitigate PTS to ensure there is no risk of PTS to marine mammals, therefore there would be no cumulative effects of PTS. For this reason, PTS had been scoped out of the cumulative and in-combination assessments. This is further reinforced by the DEFRA policy paper on reducing marine noise [MM.1.5, REP3-027]. In addition, PTS numbers were incorporated into the population modelling, therefore the applicants stated that potential impact of PTS has been given consideration in the significance of effect at a cumulative level. The applicants revised the Outline MMMP and In Principle SIP for the SNS SAC in effort to address NE's concerns around mitigation, with	**RIES Q28: To NE and the MMO: Please confirm whether you are satisfied with the updates made by the applicants to the dDML conditions [REP5-002], to include wording suggested by the MMO on noise reduction in [REP4-115]. NE is also requested to confirm whether these updates change its DL5 position that an AEoI cannot be excluded for grey seal of BNNC SAC (alone and in-combination), grey seal of the Humber Estuary SAC (in-combination) and harbour porpoise of the SNS SAC (in-combination).**

		the latest iterations to date being [REP4-054] and [REP2-049], respectively. At DL5, NE maintained the advice provided in its RR, that PTS should be scoped into the CEA and in-combination assessments [REP5-061, F16, F29]. The applicants [REP5-037] did not respond on issues F16 or F29 specifically at DL5. The applicants updated the dDML conditions at DL5 [REP5-002] to include wording suggested by the MMO on noise reduction in [REP4-115] (noting that it had made minor amendments to the MMO's text). NE's DL5 submissions advised that the applicants should commit to additional mitigation at this stage – suggesting the applicants commit to achieving a 10dB reduction in underwater noise during construction from levels predicted in the environmental assessment via primary and/ or secondary mitigation, with the exact systems and/ or technologies to be determined post-consent [REP5-057]. NE considered a commitment to a 10dB noise reduction would likely rule out AEoI of marine mammal qualifying features [REP5-057] [REP5-061]. Without such a commitment, at DL5 NE [REP5-057] remained unable to agree that AEoI can be excluded for: • grey seal of BNNC SAC – alone and in-combination • grey seal of Humber Estuary SAC - in-combination • harbour porpoise of SNS SAC – in combination	**RIES Q29: To the applicants: In line with NE's suggestion, are the applicants willing to commit at this stage to achieving a 10dB reduction in underwater noise during construction from levels predicted in the environmental assessment via primary and/ or secondary mitigation, with the exact systems and/ or technologies to be determined post-consent? If so, the applicants are requested to confirm how this commitment would be secured through the dDCO.**
BNNC SAC, Humber Estuary SAC and Humber Estuary Ramsar site – grey seal qualifying features			
3.7.2	Behavioural impacts resulting from underwater	NE's RR stated that it was not satisfied an AEoI alone or in-combination could be excluded for grey seal of the BNNC SAC, or grey seal of the Humber Estuary SAC [RR-039, Table 5.1].	The ExA notes that grey seal of the Humber Estuary Ramsar site is identified in

	noise and sufficiency of proposed mitigation	For BNNC SAC, NE stated that high numbers of the grey seal population (more than 5%) could be disturbed by piling at DBS West and in the Offshore ECC in isolation and together using the dose response approach. For Humber Estuary SAC, NE stated that more than 9% of the grey seal population had potential to be disturbed by piling (monopile or jacket pin-pile) in the Offshore ECC. NE was unclear why the impacts of the proposed development are predicted to be higher than projects with cable routes closer to the Humber Estuary SAC [RR-039, F35] - such as Hornsea 4, who were able to rule out AEoI on grey seals. NE considered that the assessment conclusions should be updated based on the highest predicted impact values, for all receptors and pathways. Where an AEoI cannot be ruled out, NE stated that additional mitigation should be explored to avoid or reduce impacts [RR-039, F35, F36]. The applicants stated that Change Request 1 (which would remove piling along the Offshore ECC from all construction scenarios) would further reduce the level of disturbance on the grey seal populations [AS-048; REP3-027 MM1.12]. The applicants provided a 'Marine Mammal RIAA Update' [AS-144] in support of that position, which provided a median ratio of the impacted: unimpacted population size. NE reviewed Change Request 1 but stated that the proportion of grey seals from the BNNC SAC disturbed by the project alone (up to 6.8%) remained high, as did the proportion of grey seals from Humber Estuary SAC disturbed in-combination (14.4%) [REP3-058]. NE continued to advise that to reduce the disturbance to the SACs, commitments should be made to noise reducing technology [REP3-058]. NE stated [REP3-059] that it did not consider the grey seal feature (and other features) of the Humber Estuary Ramsar site to be of	Table 1 of [REP5-053] as a feature for which outstanding concerns remain. Grey seal of the Humber Estuary Ramsar site is not discussed in Appendix F5 of NE's DL5 submission [REP5-057] on marine mammals. **RIES Q30: To NE: The ExA understands that resolution of the underwater noise concerns relating to grey seal of the Humber Estuary SAC would also resolve this concern for grey seal of the Humber Estuary Ramsar. The ExA requests confirmation from NE as to whether this assumption is correct.** **RIES Q31: To NE: Please also confirm whether you currently consider an AEoI can be ruled out for grey seal of the Humber Estuary Ramsar site.**

		immediate concern, however it could become a concern if impacts to the Humber Estuary SAC could not be ruled out. At DL3 the applicants provided a Technical Note: 'Significance of Effect for disturbance from piling and cumulative underwater noise' [REP3-031], using (as an alternative to Interim Population Consequences of Disturbance Model (iPCoD) population modelling) Effective Deterrence Ranges (EDR) and dose response curves, as recommended by NE. The applicants maintained that their approach using iPCoD remained the most appropriate method to assess for cumulative long-term disturbance [AS-048, REP3-031, REP4-088] and that there would be no AEoI on grey seal of the BNNC SAC or Humber Estuary SAC. NE reviewed [REP3-031] and was concerned by the significance level of 'moderate adverse' for grey seals [REP4-123]. NE advised that the applicants should commit to using noise reducing technology and provide updated documents to show how implementing this would alter estimated impact ranges and significance conclusions [REP4-123]. The applicants submitted 'Illustrative Underwater Noise Reduction Technical Note' [REP4-094, rev 1] at DL4, presenting predicted impact ranges using a 10dB noise reduction. The applicants explained Figures 4.2 and 4.3 of [REP4-094] show that with a 10dB noise reduction, the sound contours are much further away from the designated sites and that a very small proportion of the grey seal population of the BNNC SAC and Humber Estuary SAC could potentially be impacted [MM.1.12, REP4-087]. The applicants also considered that their in-combination assessments were over precautionary [MM.1.12, REP4-087]. The applicants submitted revision 2 of 'Illustrative Underwater Noise Reduction Technical Note' [REP5-032] at DL5, including underwater noise modelling at Appendix A. The applicants reiterated in [REP5-	

		036, MM.2.13] that the impact ranges with a 10dB noise reduction are much smaller. The applicants maintained [REP5-036, MM.2.13] [REP5-037] that population modelling was the best tool to understand the impacts from the proposed development. As such, the applicants confirmed [REP5-036, MM.2.13] they would not be providing the updated documents suggested by NE in [REP4-123]. At DL5, the applicants updated the dDML conditions as described in the row above and submitted an updated ES Appendix 11-4 (iPCoD modelling) [REP5-013] and an updated RIAA Part 3 [REP5-009], which included mean values, median values and confidence intervals for grey seal of BNNC SAC and Humber Estuary SAC. The applicants maintained there would be no AEoI on grey seal of the BNNC SAC or Humber Estuary SAC. As above, at DL5 NE remained unable to agree that AEoI can be excluded for grey seal of BNNC SAC (alone and in-combination) and Humber Estuary SAC (in-combination) but considered a commitment to a 10dB noise reduction would likely rule out AEoI of these features [REP5-057] [REP5-061, F35, F36].	
SNS SAC – harbour porpoise qualifying feature			
3.7.3	Behavioural impacts resulting from underwater noise and sufficiency of proposed mitigation	NE's RR stated that it was not satisfied an AEoI alone or in-combination could be excluded for harbour porpoise of the SNS SAC [RR-039, Table 5.1]. Its concerns included: • the seasonal and daily disturbance thresholds would be significantly breached for all scenarios and NE consider the applicants should commit to mitigation measures which substantially reduce the noise caused by construction [RR-039, F34]	See RIES Q28 and Q29 above.

		• the applicants have not committed to using Noise Abatement Systems (NAS) at this stage [RR-039, NE14; F33], which NE wants them to commit to in the Outline SIP and Outline MMMP • over-reliance on the SIP process and securing additional mitigation post-consent to manage in-combination impacts [RR-039, F3] The applicants stated that DML conditions are included in the dDCO [then APP-027, now REP5-002] which require the undertaker to submit a detailed SIP to the MMO for approval post-consent, prior to piling activities taking place within the SNS SAC [AS-084, F34]. With use of appropriate mitigation and the suggested management measures to be included in an updated In Principle SIP for the SNS SAC, the applicants considered [AS-048] it is likely that an AEoI of the SNS SAC would be avoided. The Outline MMMP [REP4-054] and In Principle SIP for the SNS SAC [REP2-049] were updated by the applicants, including to add reference to the DEFRA Policy Paper on Reducing Marine Noise (published 21 January 2025). At DL3, NE (having reviewed [AS-048, REP2-047 and REP2-049]) stated that the applicants' commitments to use best endeavours to deliver noise reductions for piling were insufficient to remove this as a concern [REP3-059]. NE [REP3-054] reiterated its position that the applicants should fully commit to using noise reduction technology, such as NAS, at this stage in the application. Without this, NE stated it would not be possible to rule out AEoI on SNS SAC [MM.1.12, REP3-057]. NE advised that the applicants should provide an updated in-combination assessment based on a commitment to utilise additional noise	

		mitigation to demonstrate that they have contributed to reducing the disturbed area of the SNS SAC [MM.1.12, REP3-057]. As described in the row above, at DL3 the applicants provided [REP3-031] using EDRs and dose response curves as recommended by NE, but maintained their approach using iPCoD population modelling remained the most appropriate. NE reviewed [REP3-031] and was concerned by the significance level of 'major adverse' for harbour porpoise [REP4-123]. NE advised that the applicants should commit to using noise reducing technology and provide updated documents to show how implementing this would alter estimated impact ranges and significance conclusions [REP4-123]. The applicants' 'Illustrative Underwater Noise Reduction Technical Note' [REP4-094, rev 1] presented predicted impact ranges using a 10dB noise reduction. This reduced the cumulative Sound Exposure Level PTS impact range from 11km (as presented Table 11-23 of [APP-095]) to 0.98km for harbour porpoise [Table 4-2, REP4-094]. The applicants also considered that their in-combination assessments were over precautionary [MM.1.12, REP4-087]. The applicants maintained that the final SIP for the SNS SAC is the appropriate management measures to ensure the spatial and seasonal thresholds for the SAC are maintained post-consent and there will be no AEoI of the SNS SAC [REP4-087]. The applicants submitted revision 2 of 'Illustrative Underwater Noise Reduction Technical Note' [REP5-032] at DL5, including underwater noise modelling at Appendix A. The applicants reiterated in [REP5-036, MM.2.12] that the impact ranges with a 10dB noise reduction are much smaller. The applicants maintained [REP5-036, MM.2.12] that population modelling was the best tool to understand the impacts from the proposed development. As such, the applicants confirmed [REP5-	

		036, MM.2.12] they would not be providing updated documents as suggested by NE in [REP4-123]. At DL5, the applicants updated the dDML conditions as described in the row above and submitted an updated ES Appendix 11-4 (iPCoD modelling) [REP5-013] and an updated RIAA Part 3 [REP5-009], which included mean values, median values and confidence intervals for harbour porpoise of SNS SAC. The applicants maintained there would be no AEoI on harbour porpoise of the SNS SAC. As above, at DL5 NE remained unable to agree that AEoI can be excluded for harbour porpoise of SNS SAC (in-combination) but considered a commitment to a 10dB noise reduction would likely rule out AEoI of this feature [REP5-057] [REP5-061, F33, F34].	
3.7.4	Indirect effects (spawning habitat loss for prey species during operation)	NE's RR also stated that it was not satisfied an AEoI alone or in-combination could be excluded for harbour porpoise of the SNS SAC in relation to lack of consideration of these effects [RR-039, Table 5.1]. NE advised the applicants to provide an expanded assessment and stated that if impacts to designated site features cannot be ruled out, consideration may need to be given to derogation proposals [RR-039, NE12, F20, F37]. The applicants [AS-048] [REP3-028] [REP3-027, MM.1.0] maintained that indirect effects to marine mammals due to changes to prey have been adequately addressed in the ES and RIAA. Due to the wide foraging ranges of marine mammals, the significance was assessed as negligible or minor adverse, therefore not significant in EIA terms. The applicants referred to section 4 of Appendix B 'Sandeel Habitat Potential in the Dogger Bank SAC and the SNS SAC' [APP-050], which concluded that the potential area of habitat affected within the sites is a small fraction of the available habitat and submitted updated heat mapping for sandeel in [AS-105].	**RIES Q32: To NE: NE maintains that there is still a risk of AEoI for harbour porpoise of SNS SAC as a result of impacts to prey species [REP5-061, NE12]. Can NE confirm whether this applies to the project alone and/ or in-combination?** **RIES Q33: To the applicants: Can the applicants provide an expanded assessment for indirect effects on harbour porpoise of the SNS SAC**

		The applicants [AS-048] also stated that impacts upon prey are considered in the Round 4 Plan Level HRA (RIAA Appendix I Marine Mammal Array Assessment Part 2; The Crown Estate, 2022), concluding that any impact on marine mammal features is considered to be negligible at any meaningful population scale and would not make an appreciable difference to any in-combination impact. At DL4, NE [REP4-129, NE12] maintained that there was still a risk of AEoI on marine mammal features as a result of impacts on prey species. The applicants submitted 'Effects on Prey Species Technical Note' to aid resolution of this issue [REP4-093], concluding that due to the wide foraging ranges of marine mammals and the small footprint of effect on prey, there would be no AEoI of the SNS SAC. NE reviewed [REP4-093] and stated that the current assessment was insufficient to advise that impacts on harbour porpoise at the SNS SAC, in relation to conservation objectives for the distribution, abundance and availability of key food and prey items to be maintained, could be excluded [REP5-056]. NE maintained that there is still a risk of AEoI as a result of impacts to prey species [REP5-061, NE12]. In response to ExQ2 HRA.2.6(b) [PD-022], NE provided [REP5-056] example information that in its view, should be taken into consideration when predicting the impacts on prey species for harbour porpoise. NE also continued to disagree with the applicants' conclusion that impacts on sandeel (and herring) are low to negligible [REP5-056].	**from impacts on forage fish prey species, using the example information provided by NE in [REP5-036] and submit this for DL7? If not, why not?**

3.8 Marine ornithology

3.8.1 As detailed in section 3.2 above, the applicants concluded AEoI for FFC SPA from in-combination effects. NE [RR-039] agreed with these conclusions as follows:

- Kittiwake - collision risk. NE advised that its position since Hornsea 3 had been that in-combination collision mortality across consented plans/ projects had already exceeded levels which are considered to be of an AEoI on kittiwake at FFC SPA, and that any additional mortality arising from these proposals would only reinforce this conclusion [RR-039, G65].
- Guillemot - disturbance and displacement. NE considered that in-combination effects on guillemot across consented plans/ projects had already exceeded levels which are considered to result in an AEoI and that any additional mortality from the proposed development would only reinforce this conclusion [RR-039, G65].

3.8.2 Of the remaining sites and features for which the applicants concluded no AEoI, NE stated that due to the substantial impacts of the Berwick Bank OWF, it had already advised regulators it could not rule out an in-combination AEoI on guillemot at the Farne Islands SPA [RR-039, G65].

3.8.3 It also advised that the proposed development was the highest impacting project on FFC SPA kittiwake to date and would likely result in an AEoI alone [RR-039, H5].

3.8.4 NE [RR-039] was unable to comment further on assessment conclusions as it identified several generic methodological concerns and site-specific concerns. In addition to those noted above, it identified the following as sites and features potentially affected by the application in [RR-039, Table 5.1]:

- Farne Islands SPA - guillemot and seabird assemblage
- FFC SPA – gannet, razorbill and seabird assemblage
- Greater Wash SPA - RTD, common scoter, little gull and little tern

3.8.5 NE subsequently confirmed [REP3-057, HRA.1.7] that it agreed with the applicants' conclusion of no AEoI for all other sites (ie sites not identified in Table 5.1 of [RR-039].

3.8.6 During the pre-examination stage, the applicants responded to NE's methodological concerns in [PDB-006] and provided an updated RIAA Part 4 (Revision 3) [AS-085]. NE subsequently confirmed in its Risk and Issues Log [AS-161, Appendix G] that the matters detailed below were resolved. The number(s) in brackets represent the point number in [AS-161, Appendix G]:

- displacement impacts of the two arrays separately and summed (G1 and G11)
- baseline characterisation (G3)
- calculations of seasonal peak abundances (G5)
- seasonal peak abundances of the two arrays separately (G6)
- razorbill abundance estimates (G7)
- baseline mortality rates (G9)
- approach to calculating construction displacement impacts (G13)
- guillemot seasonality (G14)
- gannet avoidance rate and macro-avoidance (G16)*
- breeding seasoning apportioning (G20)
- apportioning of guillemot impacts to FFC SPA (G27)
- guillemot apportioning method (adult proportions) (G28)
- apportioning of razorbill impacts to FFC SPA (G29)
- apportioning of kittiwake impacts to FFC SPA (G30)
- PVA to assess the impacts of the projects alone on FFC SPA gannet (G31)
- text discrepancies (G33 and G34)
- impacts on RTD of Greater Wash SPA from the reduction in habitat during cable installation (G35)
- need for in-combination assessments for RTD of Greater Wash SPA (G37) (note NE did not fully agree with the approach but due to the low predicted impacts did not consider it would materially change its advice).
- inclusion of projects for which kittiwake compensation measures are required (Hornsea 3, Norfolk Boreas, Norfolk Vanguard, East Anglia Two, East Anglia One North, Hornsea 4 and Sheringham & Dudgeon Extensions Projects (SEP&DEP)) within the in-combination assessment (G39)*
- inclusion of Hornsea 4 guillemot impacts within the in-combination assessment (G40)*

* Asterisk denotes matters also raised by the Royal Society for the Protection of Birds (RSPB) [RR-049] [AS-128] [REP1-087], but not identified in the most up to date RSPB SoCG [REP4-071].

3.8.7 Several of NE's concerns remained and were further discussed during the examination, as detailed in below.

3.8.8 In its RR, the RSPB [RR-049] stated it could not rule out an AEoI from the project alone or in combination on the FFC SPA as follows:

- gannet - combined collision and displacement mortality
- kittiwake - collision mortality
- guillemot - displacement mortality
- razorbill - displacement mortality
- seabird assemblage - combined collision and displacement mortality

3.8.9 Due to methodological concerns, the RSPB was also unable to reach conclusions on any of the SPAs screened in by the applicants (see Annex 1 of this RIES).

3.8.10 Matters discussed during the examination are detailed further below.

Digital aerial surveys (DAS)

3.8.11 The RSPB [RR-049] [REP1-087] raised concerns with the digital surveys, advising that any biases need to be carefully described. It noted [REP4-113] there is no independent external quality assurance and raised the need for increased clarity on quality assurance and data validation. It noted a review of aerial survey methods by NatureScot was published in January 2023, which was not accounted for in NE's guidance. It set out its remaining concerns in its SoCG [REP4-071, Table 3.3].

3.8.12 The applicants [PDA-013] responded to confirm that methodological details were provided in [APP-105]. They stated [REP2-057] [REP5-036] [REP5-038] that surveys followed NE's best practice methodology using the same methods for numerous OWF ornithology assessments. They considered the baseline data obtained to be robust and reliable. A further detailed response was provided in [REP3-029], confirming that DAS had been used for all UK OWFs for more than 10 years and follows statutory guidance. The applicants provided further information on the quality assurance process in [REP5-038].

3.8.13 NE [REP5-062, OR.2.3] subsequently confirmed it was happy with the DAS undertaken by the applicants.

Gannet collision risk – macro-avoidance

3.8.14 NE [RR-049, G16] advised that gannet collision be assessed using an avoidance rate of 99.3%, along with a macro-avoidance correction factor between 65-85%. The applicants revised its assessment accordingly in Revision 3 of the RIAA Part 4 [AS-085]. They also presented the collision risk modelling without the application of the macro-avoidance correction factor. NE confirmed this matter to be resolved [REP1-067].

3.8.15 However, the RSPB [RR-049] [REP1-087] [REP4-071] disagreed with NE's advice, stating it does not take account of seasonal variation in macro

avoidance and assumes that gannet would have the same reactive flight response as gulls, despite having lower flight manoeuvrability. It also highlighted the potential for habituation to the presence of turbines which results in lower macro-avoidance and an elevated risk of collision. The RSPB stated that JNCC also do not accept NE's advised approach and considered this would have a material impact on resulting impact assessments.

Displacement assessments

Displacement and mortality rates for auks

3.8.16 The applicants [APP-048] presented the results of the auk displacement assessment using NE's advised ranges for displacement (30%-70%) and mortality rates (1%-10%). However, they advocated 50% displacement and 1% mortality rate (based on a review written for the Norfolk Vanguard OWF). They considered their preferred rates to be precautionary and cited Trinder et al (2024) (as referenced within [AS-150]) as evidence of low levels of auk displacement [PDB-006] [REP3-027, OR.1.13] [REP3-030].

3.8.17 NE [RR-039, G25] [AS-159, page 13] [REP3-057, Annex A] [REP4-124] noted that the applicants' conclusions had not considered impacts using NE's advised rates. It acknowledged that there are no definitive mortality rates for seabirds and advised a range be assessed to account for variability and uncertainties. NE did not consider the Trinder et al (2024) paper provided sufficient evidence that auks are not displaced by OWFs as it is not focused on array-scale displacement. It cited Lamb et al (2024) and Peschko et al (2024) (as referenced within [AS-150]) in support of its position that basing impact assessments on a single rate of 50% displacement is not appropriate. It confirmed that it was not suggesting a 10% mortality rate represents the most likely scenario, but did not consider that even the upper limit of its advised displacement range to be over-precautionary. NE confirmed [REP5-062, OR.2.2] that it would base its conclusions on the range of figures presented, with particular focus on 70% displacement and 2% mortality.

3.8.18 The applicants disagreed with NE's interpretation of Trinder et al (2024) and considered Lamb et al (2024) to be unreliable and unrepresentative of the predicted responses of auks to the proposed development [REP3-028, G22] [REP4-087]. They advised it was unlikely that agreement would be reached with NE on this displacement and mortality rates [REP5-037].

3.8.19 The RSPB [REP4-113] supported NE's advocated approach, noting that single estimates of displacement and mortality are contrary to the European Commission's Precautionary Principle guidance. It noted inherent dynamism in the marine environment and advised against relying on studies carried out at a single site, such as Trinder et al (2024); instead it referred to Lamb et al (2024). The RSPB therefore advised three sets of displacement and mortality rates should be considered, those being (i) the applicants, (ii) NE's and (iii) probable values of 60% displacement and mortality rates 3-5% for the breeding season and 1-3% for the non-breeding season (these reflected advice to OWF developments in Scottish waters).

Details of in-combination totals for displacement impacts

3.8.20 NE [RR-039] requested details of the in-combination displacement assessment in full to allow the methods used and full range of predicted impacts to be evaluated. The applicants provided additional matrices in RIAA Part 4 (Revision 3) [AS-085].

3.8.21 However, NE further advised the applicants to present in-combination totals for displacement-affected species according to the agreed impact values for each project (as for in-combination collision assessment), rather than abundance estimates [AS-161, G42]. NE maintained this position at DL5 [REP5-058].

RIES Q34: To the applicants: Can the applicants confirm whether they intend to update the in-combination assessment totals for displacement-affected species according to agreed impacts?

RIES Q35: To NE: Can NE explain the basis for its request for in-combination totals for displacement-affected species according to agreed impacts and whether it is likely that receiving such information would materially affect their conclusions?

Presentation of displacement matrices including upper and lower confidence intervals

3.8.22 Further to the applicants' assessment updates in RIAA Part 4 (Revision 3) [AS-085], NE requested that upper and lower confidence intervals be presented for the two arrays combined [AS-126] [AS-159, G53]. However, the applicants [REP3-028, Table 2-13] did not consider it appropriate for the confidence interval estimates to be summed.

3.8.23 At DL5, NE [REP5-061] noted that whilst displacement matrices including confidence intervals had not been submitted, the upper confidence level impact figures for auks had been provided for use in in the calculation of compensation quanta.

Decommissioning

3.8.24 NE [RR-039, G18] advised that displacement impacts at decommissioning be included for all species in the displacement assessment and calculated as per construction displacement impacts. The applicants [PDB-006] explained that ES Chapter 12 Offshore Ornithology [APP-103] provided the decommissioning assessment which was assumed to be equivalent to construction effects. Whilst NE continued to advise that an explicit quantification be provided, it noted the matter as unlikely to make a material difference to its advice [REP3-060].

In-combination assessments

Inclusion of relevant projects

3.8.25 NE [RR-039, G5 and G51] noted that several developments with recently submitted applications or that "are material considerations in the planning process" had been excluded from the in-combination assessments, including:

- Outer Dowsing OWF
- Five Estuaries OWF
- North Falls OWF
- Dogger Bank D OWF

3.8.26 The applicants' Revision 3 of RIAA Part 4 [AS-085] included these projects in the in-combination assessment, except for Dogger Bank D OWF. The applicants stated [AS-085] that no quantitative information on impacts is available for Dogger Bank D as it has not submitted a PEIR. NE [REP4-129] advised Dogger Bank D's section 42 consultation (and PEIR publication) is expected 6 June 2025 – 1 August 2025.

RIES Q36: To the applicants: The applicants are requested to provide an update to their assessments once Dogger Bank D's PEIR is publicised. On the basis that this is on or shortly after 6 June 2025, the revised assessment should be submitted alongside comments on the RIES for DL7.

3.8.27 The applicants also incorporated Forthwind OWF as a Tier 4 project in Revision 4 of the RIAA Part 4 [REP4-016]. This revision also addressed minor errors identified by NE in the examination to that date.

Missing in-combination assessments

3.8.28 NE [RR-039, G4 and G50] noted that in-combination assessment had not been undertaken (except for FFC SPA) as the applicants considered impacts of the project alone would cause no 'measurable increase in mortality'. It considered that as a minimum, in-combination assessments should be carried out for all species that meet the 1% baseline mortality threshold (calculated according to SNCB guidance). It advised in-combination assessments as follows.

3.8.29 Guillemot of Farne Islands SPA - The applicants responded that the proposed development would not contribute to in-combination effects on guillemot or puffins of the Farne Islands SPA [AS-085]. Nevertheless, Revision 3 of the RIAA Part 4 [AS-085] included an in-combination assessment of guillemot and puffins displacement (sections 9.8.2.2.5 and 9.8.2.3.5, respectively). This concluded that there would be no in-combination AEoIs.

3.8.30 NE [AS-161, G37] [AS-159, G37] had outstanding concerns with the assessment methodology; these resulted in the applicants' revised assessment in Revision 4 of the RIAA Part 4 [REP4-016, section 9.7]. However, NE advised that the assessment had not included all OWFs within foraging range for guillemot breeding at the Farne Islands SPA. It highlighted that the Rampion 2 decision had concluded an in-combination AEoI on guillemot at the SPA; it therefore could not rule out an AEoI for in-combination impacts to guillemot of Farne Islands SPA [REP5-053] [REP5-058].

3.8.31 The RSPB [REP5-065, OR.2.23] similarly considered there to be an AEoI for guillemot from in-combination displacement impacts, but confirmed it agreed no AEoI on puffins.

RIES Q37: To the applicants: Can the applicants revise their in-combination assessment for guillemot at the Farne Islands SPA to include all relevant projects, as advised by NE in [REP5-058]?

3.8.32 RTD of Greater Wash SPA - An in-combination assessment from disturbance and displacement from vessel movements, during construction and O&M was provided by the applicants in Revision 3 of the RIAA Part 4 [AS-085, section 9.5.2.1.5]. This concluded that there would be no in-combination AEoIs.

3.8.33 NE [AS-159, G37] confirmed it did not fully agree with the applicants' approach but that due to low predicted impacts, any changes to the approach would not materially change its advice.

3.8.34 Atlantic puffin of FFC SPA - The applicants [AS-085] considered that an in-combination assessment was not required. The apportioned 1.4 puffin mortalities to FFC SPA from the proposed development. They noted that for SEP&DEP, a mortality of 2.4 was apportioned to FFC SPA. NE's conclusion for that project was that "…there would be no measurable contribution to an in-combination assessment of puffin mortality due to displacement from SEP and DEP" [AS-085].

RIES Q38: To NE: Does NE agree with the applicants that an in combination assessment for Atlantic puffin of FFC SPA is not required? If so, can it explain why, given the precedent it set on SEP&DEP?

Consideration of 'de minimis' impacts

3.8.35 The RSPB [RR-039] stated that the applicants had suggested that small scale negative impacts should be regarded as not measurable and therefore should be ignored in determining in-combination impacts (ie if impacts on a SPA population are <1% increase in baseline adult mortality rate, it is not considered in-combination with other projects).

3.8.36 The RSPB [REP1-087] also did not agree with the applicants' 'de minimis' approach that small scale negative impacts should be regarded as not measurable and therefore ignored in an in-combination assessment.

3.8.37 The applicants [REP2-057] explained they had applied a threshold for detectability. It considered that if background mortality was reduced by <1%, the predicted in-combination population status impact estimated with and without the projects would be indistinguishable from each other. They explained it had undertaken an in-combination assessment for FFC SPA as suggested by RSPB, but considered that such an approach could predict more birds at risk of displacement than are present in the populations.

PVA

Displacement and mortality rates for auks within the PVA

3.8.38 NE [RR-039, G56] [AS-161, G26, 43] noted that the highest combination of rates included for auks within the PVA were 70% displacement and 2% mortality. NE acknowledged that recent consent decisions had been based on these rates, however it advised the applicants to present the results of the full range of displacement impacts on guillemot and razorbill in the PVA modelling.

3.8.39 The applicants submitted revised PVAs at DL4 [REP4-034]. NE subsequently confirmed the matter to be largely addressed [REP5-051], however considered that the impacts of Hornsea 4 on FFC SPA guillemot and razorbill populations should be assessed using a 70% displacement rate and a 5% mortality rate [AS-159, G58 and G59] [REP5-061].

RIES Q39: To the applicants: Can the applicants provide updated in-combination assessment applying a 70% displacement rate and a 5% mortality rate for the impacts of Hornsea 4 on FFC SPA?

PVA results

3.8.40 NE [AS-159, G57] noted that the PVA presented in ES Appendix 7.12.12.13 Population Viability Analysis [APP-116] had not been updated alongside Revision 3 of the RIAA Part 4 [AS-085]. It requested the inputs and outputs for all PVA scenarios undertaken for the assessment are clearly presented, along with the log files for all PVA scenarios undertaken. NE further noted that several PVA results in the revised RIAA Part 4 were not as expected [AS-159, G60] and advised the applicants to check the results of all PVA scenarios run.

3.8.41 The applicants [REP3-027, OR.1.9] advised that complete outputs would not be helpful as they are very large tables of simulations. However, they offered the files to NE if required [REP4-087]. The applicants considered that differences with SEP&DEP PVAs were likely due to different input parameters (including starting population sizes), differing timeframes for which the PVAs were run and due to population growth [REP3-028, Table 2-13] [REP4-087].

3.8.42 At DL5, NE stated that it had been unable to replicate the results for kittiwake, guillemot or razorbill at FFC SPA [REP5-058] and requested further verification from the applicants.

RIES Q40: To the applicants: Can the applicants verify and present the PVA for kittiwake, guillemot or razorbill at FFC SPA as requested by NE in [REP5-058]?

PVA interpretation

3.8.43 NE made several comments regarding the interpretation of PVA results and advised the basis upon which it would make its conclusions. The ExA notes that these matters are coded purple by NE in the most recent Risk and Issues Log [REP5-061], as a note for the ExA/ competent authority. By DL5, the applicants had presented assessments in line with NE's advice, however they considered in [PDB-006] that the advice, as summarised below, was over precautionary. NE advised:

- that it would base its integrity judgements taking into account both the counterfactual of population growth rate (CGR) and counterfactual of population size (CPS) [RR-039, G57]
- seasonal mean peak abundance estimates be applied [RR-039, G58]
- a 1% mortality rate for gannet displacement [RR-039, G59]
- against the use of as built parameters for other projects [RR-039, G60]
- that assumptions cannot be made about unquantified resilience in PVAs run as 'closed populations' NE [RR-039, G61]

PVA duration

3.8.44 NE [REP5-058] noted that all PVAs had been carried out for 30 years, beginning in 2027 and that project timeline indicates impacts would begin in 2029. It also noted that the applicants referred to the lifetime of the proposed development as 35 years in [REP3-028].

RIES Q41: To the applicants: Can the applicants clarify the proposed lifetime of the proposed development and confirm whether they will re-run the PVAs?

Precaution

3.8.45 There has been extensive debate between the applicants, NE and the RSPB during the examination to date regarding the extent of precaution required by NE's advice. The applicants [PDB-006] [REP3-028, Table 2-13] [REP4-087, Annex B] considered that there are several points within NE's methodology which adopt the worst case or upper levels of statistical distributions as the starting point for the following stage of the assessment. Thus, many steps could combine to result in the overall assessment of impact magnitude being highly precautionary and increasingly improbable. They submitted 'Precaution in the Ornithology Assessment and Implications for Compensation Quantum' [REP3-030] identifying potential contributors of precaution in the assessment of impacts.

3.8.46 In contrast, NE [RR-039, G7] [AS-159] [REP3-057, Annex A] did not consider its methodology to be 'overly precautionary' and highlighted several potential sources of under-precaution (although did not dispute them for use within the assessment).

Site specific concerns

3.8.47 Further matters discussed specifically in relation to FFC SPA, Greater Wash SPA and Forth Islands SPA are detailed in Tables 3.8 to 3.10 below.

Table 3.8: FFC SPA

ID	Issue	Details of issue	ExA observation/ question
3.8.1	Calculation of adult baseline mortality for gannet, kittiwake, puffin and razorbill	NE [RR-039, G32 to G35] advised the applicants to recalculate adult baseline mortality and the impact assessment for gannet, kittiwake, puffin and razorbill of the FFC SPA. It later confirmed [AS-159] [AS-161, G21 to G24] that the applicants had updated the adult baseline mortality rates within RIAA Part 4 (Revision 3) [AS-085]. However, it considered the applicants' characterisation of these trends to be misleading in terms of the characterisation of both seabird population trends and NE's advice.	The ExA notes these matters to be resolved or largely resolved within NE's DL5 Risk and Issues Log [REP5-061].
3.8.2	Incorrect PVA population sizes used for kittiwake and razorbill	NE [RR-039, G49] advised that the most recent population estimate (2022 count figures) should be used as the starting population for PVAs run for this population. The applicants made relevant updates to the RIAA Part 4 (Revision 3) [AS-085], and NE confirmed the matter to be resolved [REP5-061].	The ExA understands this matter to be resolved.
3.8.3	PVA for kittiwake, guillemot and razorbill from project alone	NE [RR-039, G43 and G44] advised that PVAs for kittiwake, guillemot and razorbill at FFC SPA be carried out for impacts of the project alone, as the 1% mortality rate threshold was exceeded when assessments are conducted in line with SNCB advice. This was provided by the applicants in RIAA Part 4 (Revision 3) [AS-085]. NE [AS-159, G3] noted that the applicants PVAs highest combination of displacement and mortality rates for guillemot and razorbill was 70% and 2%, respectively. It advised a full range be presented. The applicants [REP3-028, Table 2-13] considered there is little insight to be gained from running PVA on what is clearly a highly	The ExA notes that as of DL5, NE does not agree AEoI can be excluded as a result of collision risk to kittiwake from the proposed development alone [REP5-053]. **RIES Q42: To NE: Can NE confirm whether it agrees an AEoI from the proposed development**

ID	Issue	Details of issue	ExA observation/ question
		precautionary and improbably high impact magnitude. They noted [REP4-087] that recent SoS decisions had been based on no higher than 70% displacement and 2% mortality; however, they provided updated PVAs at DL4 [REP4-034]. The RSPB [REP4-113] agreed the results of the PVA would not materially affect conclusions as to the significance of impacts and considered there too be an AEoI of gannet of FFC SPA from combined collision and displacement mortality from the project alone [REP1-087]. NE [REP5-062, OR.2.26] also confirmed its outstanding concerns would not materially affect assessment conclusions and confirmed it was satisfied with the project alone assessment. It agreed AEoI can be ruled out for gannet at FFC SPA for the project alone.	**alone can be excluded for razorbill and guillemot of FFC SPA?**
3.8.4	In combination impact totals for kittiwake, guillemot, razorbill and gannet	NE [RR-039, G54] advised that in-combination totals for kittiwake, guillemot, razorbill and gannet at FFC SPA did not appear to reflect the combined impacts of the proposed development with other relevant projects. The applicants revised the RIAA Part 4 (Revision 3) [AS-085], however NE [AS-159, G58 and G59] responded that the total for impacts on kittiwake was lower than it expected. The applicants further revised the in-combination totals for all four species in the RIAA Part 4 (Revision 4) [REP4-016, section 9.6] taking into account NE's comments in [AS-159]; this resulted in a further reduction of in-combination kittiwake collisions. At DL5, NE confirmed an AEoI of gannet of FFC SPA could be ruled out from the project alone and in-combination [REP5-053]. However, it did not agree AEoI could be excluded for in-combination impacts on guillemot, razorbill, the seabird assemblage or kittiwake. It noted that	**RIES Q43: To the applicants: NE has advised the applicants to check in-combination figures, explain any remaining discrepancies, and ideally re-run PVAs. It also requested that in-combination assessment totals for displacement-affected species be presented according to agreed impacts, rather than apportioned abundances. The**

ID	Issue	Details of issue	ExA observation/ question
		kittiwake totals were lower than those presented during the SEP&DEP examination which had accounted for difference avoidance rates. It also noted that impact figures for several recent projects appeared to be incorrect for guillemot, razorbill and kittiwake. It acknowledged these discrepancies were not likely to affect the assessment conclusions or compensation quantum but considered it important to be as accurate as possible as it may be used as a reference for future projects. The RSPB also considered there to be an AEoI on kittiwake (in-combination only) and guillemot and razorbill (alone and in-combination) [REP5-065].	**applicants are requested to submit this information into the examination.**
3.8.5	PVA results for gannet, kittiwake, guillemot and razorbill - impacts of HPAI and population trends	NE [RR-039, G13, G14, G62] noted that the applicants had cited recent population growth at the FFC SPA as a reason for concluding no AEoI is likely. It did not consider it appropriate to assume the same growth rate for the next 30 years as the populations would likely experience density-dependent mechanisms over the lifetime of the proposed development, and there are uncertainties about the long-term population impacts of HPAI and a wide range of other environmental pressures, including climate change. It noted that applicants had acknowledged HPAI and climate change but had not considered them in their interpretation of the PVA results. It therefore advised the applicants to consider realistic assessments of current and future population trends, considering all relevant evidence, when interpreting the results of updated PVAs. The RSPB [RR-039] [REP1-087] also highlighted concerns about the impacts of HPAI and advised that a high level of precaution had not been adequately considered by the applicants. The applicants acknowledged population trends and the impacts of HPAI in Revision 3 of the RIAA Part 4 [AS-085]. They considered that HPAI had a less	**RIES Q44: To the applicants: NE has advised the applicants to take a similar approach to SEP&DEP in interpreting the PVAs. Can the applicants confirm if it intends to undertake this work?**

ID	Issue	Details of issue	ExA observation/ question
		significant impact on seabird populations than feared (with some exceptions) and noted there is no clear means by which HPAI could be considered in a quantitative manner. Furthermore, the applicants highlighted the variability in species responses to HPAI [PDA-013] [REP2-057] [REP3-028] [REP4-087]. The applicants [PDB-006] [REP3-027, OR.1.9] [REP3-028, G49] [REP4-086] considered NE's advice to consider density dependence contradicts its standard advice. They noted that HPAI appeared to have been much less significant than feared (with some exceptions) and resulted in temporary impacts on population growth rather than any long-lasting effects. The applicants [REP5-036, OR.2.29] considered that evidence of any physiological changes caused by HPAI was limited and considered RSPB's comments to be mostly unfounded and largely speculative. They noted that populations decline varied across locations and that any wind farm mortality would be predicted to decline either in the same proportion as population declines, or potentially to a greater extent. The applicants did not consider that HPAI had made seabird populations less robust or more vulnerable to wind farm impacts. NE [AS-159, G49] [REP5-060] disagreed that the impacts of HPAI on seabird populations had not been significant and noted that the outbreak continued globally. It confirmed that density-dependence did not need to be incorporated into PVAs but maintained that realistic future seabird population trends (including HPAI and climate change) needed to be considered in the interpretation of the significance of the results of PVAs. NE advised the applicants to take a similar approach to SEP&DEP which considered a range of potential future growth rates in order to allow decision-makers to consider the likelihood of SPA conservation objectives being met for a range of potential future	

ID	Issue	Details of issue	ExA observation/ question
		scenarios. However, it noted that this matter being assessed would not materially impact its assessment conclusions [REP5-061]. The RSPB [REP4-071] remained of the view that its concerns regarding HPAI had not been fully addressed by the applicants.	
3.8.6	Assessment of effects on the seabird assemblage	The ExA queried why the RIAA Part 4 had only assessed impacts on the Atlantic puffin component of the seabird assemblage and not the remainder of the assemblage [PD-016, OR.1.11]. The applicants [REP3-027] explained that it is challenging to assess the seabird assemblage in its own right and confirmed that of the species not listed as a named feature, puffin had been assessed as if it were a named feature. Other assemblage component species had been screened out. Whilst NE [AS-159, G23] identified errors in the calculation of displacement impacts on puffin at FFC SPA, it noted this discrepancy is unlikely to lead to a material change in the impact conclusions however did not explicitly confirm its position in relation to AEoI. Both NE [REP5-053] and the RSPB [RR-049] [REP1-087] could not rule out AEoI on the seabird assemblage. The RSPB explained [REP5-065, OR.2.24] that NE's supplementary advice has a target for abundance of the seabird assemblage feature. It considered that adverse effects on individual species of the SPA would contribute collectively to undermining the achievement of the abundance target and therefore the FFC SPA's conservation objectives.	The ExA notes that NE and the RSPB are unable to rule out an AEoI on the seabird assemblage of FFC SPA. **RIES Q45: To NE: Can NE confirm whether it agrees an AEoI on the Atlantic puffin component of the FFC SPA seabird assemblage can be ruled out?**
3.8.7	Indirect effects from impacts on	NE [RR-039, G66] did not agree AEoI could be excluded due to impacts on prey species. It noted consideration had only been given to temporary construction impacts on prey, rather than the indirect effects of permanent spawning habitat loss that could occur. It advised that	**RIES Q46: To NE: NE maintains that there is still a risk of AEoI on ornithology receptors at**

ID	Issue	Details of issue	ExA observation/ question
	forage fish prey species	further assessment was needed to understand how impacts on fish and shellfish receptors on the Dogger Bank might influence prey availability for seabirds. NE confirmed [REP5-062, HRA.2.6(a)] that its concerns related predominantly to FFC SPA. NE considered that the conservation objectives of FFC SPA are likely to be hindered in relation to impacts to prey availability [Annex E1, RR-039]. NE advised [RR-039] that Appendix B 'Sandeel Habitat Potential in the Dogger Bank SAC and the SNS SAC' [APP-050] be expanded to include FFC SPA receptors. The applicants [FSE.1.10, REP3-027] confirmed that seabirds are mentioned in section 1.2.1 of [APP-050] and that this would include consideration of any species from the FFC SPA present within the Dogger Bank South array areas. The applicants submitted 'Effects on Prey Species Technical Note' to aid resolution of this issue [REP4-093]. The applicants' position [PDB-006; REP4-093] is that impacts on prey species have been assessed in the ES and HRA Report, supported by [APP-050] and the updated heat mapping for sandeel in [AS-105]. The applicants also noted that impacts upon prey were considered in The Crown Estate Round 4 Plan Level HRA (RIAA Appendix H – Ornithology Array Assessment Part 2; The Crown Estate, 2022), concluding that any impact on ornithology features would be negligible and not make an appreciable difference to any in-combination impact [PDB-006; REP4-093]. The applicants considered there is good evidence (as cited in [REP4-093]) that seabird populations would be very little affected by any impacts on their prey and stated that population fluctuations are typical of forage fish species. The applicants stated that small changes in prey stock biomass, as assessed in ES Chapter 10 - Fish and Shellfish Ecology [APP-091], would have undetectable effects on the seabird	**FFC SPA as a result of impacts to prey species [REP5-061, NE12]. Can NE confirm which specific qualifying features of FFC SPA this applies to and whether this is for the project alone and/ or in-combination?** **RIES Q47: To the applicants: Can the applicants provide an expanded assessment for indirect effects on ornithology receptors of FFC SPA from impacts on forage fish prey species, using the example information provided by NE in [REP5-036] and submit this for DL7? If not, why not?**

ID	Issue	Details of issue	ExA observation/ question
		populations which prey on those stocks, and even if prey stocks are affected more widely than currently assessed, this would still not result in seabird population impacts [PDB-006; REP4-093]. NE [REP3-057, HRA.1.3] highlighted clear connectivity with birds foraging from FFC SPA and the Dogger Bank South array areas. At DL4, NE [REP4-129, NE12] maintained that there is still a risk of AEoI of ornithological features as a result of impacts on prey species. NE reviewed [REP4-093] and stated that the current assessment was insufficient to advise that impacts on ornithology receptors at FFC SPA, in relation to conservation objectives for the distribution, abundance and availability of key food and prey items to be restored, could be excluded [REP5-056]. NE maintained that there is still a risk of AEoI as a result of impacts on prey species [REP5-061, NE12]. In response to ExQ2 HRA.2.6(b) [PD-022], NE provided [REP5-056] example information that in its view, should be taken into consideration when predicting the impacts on prey species for ornithology receptors. NE also continued to disagree with the applicants' conclusion that impacts on sandeel (and herring) are low to negligible [REP5-056].	
3.8.8	Mitigation measures to reduce impacts on seabird features	Given the large numbers of seabirds recorded in the baseline surveys and the potential levels of connectivity with FFC SPA in particular, NE advised that further consideration be given to potential mitigation measures to reduce impacts. This included array area reductions, changes to the design envelope and layout of arrays, or increasing hub height of turbines. It advised that seabird density hotspot modelling be undertaken. [RR-039, G7, G28 and G63] [AS-159, page 35] [AS-161].	The ExA notes the positions of NE and the Applicants on this matter.

ID	Issue	Details of issue	ExA observation/ question
		The Applicants [PDB-006] [REP3-027, OR.1.44] [REP3-028, Table 2-13] [REP4-087] considered they had demonstrated adherence to the mitigation hierarchy. They noted that bird distribution data had been considered as part of the boundary refinement exercise and that the number of turbines was reduced during the pre-application stage. They responded that mitigation relating to air gaps had been applied in accordance with the Round 4 plan level Habitats Regulation Assessment (The Crown Estate 2022) (ie the clearance of the blades above the water is set at a minimum 34m above Mean Sea Level (MSL)). They submitted an 'Ornithological Mitigation Option Report' [AS-118, revised in REP4-081] which concluded that increasing minimum air gap would risk the proposed development being potentially commercially unviable. Further details were provided in [REP5-036, OR.2.4]. The Applicants further stated that site selection was a key embedded mitigation measure, with arrays being located at least 100km from the nearest nesting colonies [AS-057] [REP4-033] [REP4-086]. However, NE [REP3-057, OR.1.39] [REP5-060] did not consider that the location of the proposed development, within a key foraging area in the Dogger Bank SAC, would meaningfully reduce impacts to FFC SPA features. It advised that the mean max foraging range plus 1 standard deviation (SD) should be used to establish connectivity for guillemot and razorbill at FFC SPA, as opposed to the Applicant's preferred global mean foraging range. This would result in connectivity of the proposed development with razorbill and guillemot and as such NE did not consider site selection to be an effective measure for FFC SPA seabird features.	

ID	Issue	Details of issue	ExA observation/ question
		With regards to density hotspot modelling, the Applicants considered it to be an unreliable basis upon which to conduct boundary changes due to its variability in time. However, NE [REP5-058] [REP5-060] advised this could demonstrate consistent areas of high usage. It noted that the proposed development is located within Dogger Bank SAC, an area important for sandeel and likely to attract seabirds breeding at FFC SPA and that tracking data of kittiwake breeding at FFC SPA showed overlap with the proposed development area. It advised that if density hotspot modelling demonstrates consistent areas of high usage, the potential for array reductions should be investigated. Furthermore, it considered the Applicants' refusal to do so contradicts their statement they have done everything feasible to mitigate impacts to offshore ornithology.	

Table 3.9: Greater Wash SPA

ID	Issue	Details of issue	ExA observation/ question
3.9.1	RTD – cable installation restriction	NE [RR-039, G64] [AS-159, G50] [REP4-129, G50/ G64] advised the applicants to consider avoidance or restriction of cable installation works within 2km of the Greater Wash SPA during the over-wintering period (1st November to 31st March inclusive) to avoid adverse effects on RTD. The applicants [PDB-006] [AS-085] confirmed they had included embedded mitigation for RTD and adhered to NE's Best Practice Protocol for Minimising Disturbance including the use of existing shipping lanes (which was incorporated into Revision 2 of the Outline	The ExA understands this matter to be resolved.

ID	Issue	Details of issue	ExA observation/ question
		PEMP [REP2-041]) and considered the measure was not required. They reiterated their conclusion of no AEoI. The applicants provided additional detail regarding the potential effects on RTD in [REP3-027] and [REP3-028]. They noted the overlap of the Offshore ECC within the Greater Wash SPA is 12.1km^2, representing approximately 0.3% of the total area of the SPA, in regions of the SPA with low densities of RTD recorded. They considered displacement would have little or no effect on RTD survival and that a maximum of 0.2 individuals would be expected to die across the winter period as a result of displacement effects from offshore cable installation activities, which would be restricted to a maximum of one non-breeding season. They considered a seasonal restriction to be over-precautionary and noted no such restriction was placed on Dogger Bank A and B (formerly Creyke Beck) which also overlapped with the Greater Wash SPA. The applicants provided figures showing the density of RTD in relation to the Offshore ECC [Figures B-1 and B-2, REP4-088] and highlighted the other mitigation measures they had committed to for RTD [REP4-087]. The applicants maintained that due to the negligible area within which any RTD would be displaced and the low density of RTD in the area, there would be no AEoI of the Greater Wash SPA and therefore, a seasonal restriction would be over-precautionary [REP4-088] [REP5-036]. At DL5, NE [REP5-053] [REP5-062, OR.2.21] confirmed it was satisfied that an AEoI on RTD of the Greater Wash SPA could be ruled out, due to the very limited interaction between the cable works area and the Greater Wash SPA and 2km buffer. NE confirmed a seasonal	

ID	Issue	Details of issue	ExA observation/ question
		restriction was not necessary to rule out AEoI in this case and that this issue was resolved [REP5-062, OR.2.21] [REP5-061, G50/ G64].	
3.9.2	Change Request 1	NE [REP3-058] advised that changes to the indicative location of the planned HDD exit pits as part of Change Request 1 (exit pits to be located in the subtidal area, with intertidal exit pits removed from the design envelope) could change the likelihood of impacts to RTD of the Greater Wash SPA. The applicants responded [REP4-088] that both subtidal and intertidal exit pits had been assessed in the ES and RIAA and explained that during installation activities for the subtidal exit pits and cable pull, installation vessels would remain effectively stationary while works were undertaken. The applicants [REP4-088] provided figures showing the density of RTD in relation to the indicative location of where the subtidal exit pits may be constructed [Figures B-1 and B-2, REP4-087]. The applicants noted there were no modelled RTDs in the cable landfall region of the Greater Wash SPA and explained that they had already assessed vessels in this area, regardless of the change to the location of the exit pits [REP4-086]. The applicants stated that any potential effects on RTD due to construction of the subtidal exit pits and subsequent cable pull activities within the Greater Wash SPA would not result in an AEoI, either alone or in-combination [REP4-088]. At DL5, NE welcomed the clarification in [REP4-088] and as above, confirmed [REP5-053] [REP5-062, OR.2.21] it was satisfied that an AEoI on RTD of the Greater Wash SPA could be ruled out.	The ExA understands this matter to be resolved.

Table 3.10: Forth Islands SPA

ID	Issue	Details of issue	ExA observation/ question
3.10.1	Apportioning of impacts to gannets	The RSPB [RR-049] [REP1-087] noted the applicants had not assessed impacts on gannets from Forth Islands SPA on the basis that 100% of birds present would originate from FFC SPA during the breeding season. However, it highlighted studies tagging gannets from the Forth Islands SPA in the footprint of the application site. The applicants [REP2-057] acknowledged the potential for some overlap in foraging ranges between adjacent colonies. They concluded that the annual impacts on the FFC SPA and Forth Islands SPA were 21 and 4 individuals respectively and that a small adjustment to the relative contributions between the two SPAs would make no material difference to the conclusions reached. The applicants considered they had undertaken a precautionary approach by assuming 100% of breeding birds are from the smaller colony at FFC SPA. The SoCG with the RSPB [REP4-071] reiterated the RSPB's position from [REP1-087] that it cannot reach a conclusion as to the significance of impacts to the gannet component of the Forth Islands SPA. The RSPB [REP5-065, OR.2.30] noted that the applicants' annual impact is based outwith the breeding season and it considered there would be birds from Forth Islands SPA present in the Dogger Bank South array during the breeding season. It could not exclude AEoI in absence of mortalities and PVAs with breeding birds apportioned to the Forth Islands SPA, and without the macro-avoidance correction.	The ExA notes the positions of the applicants and the RSPB on this matter.

3.9 Summary of examination outcomes in relation to adverse effects on integrity

3.9.1 To date in the examination, some of the matters identified in Section 3 of this RIES in respect of disputed AEoIs remain unresolved. The ExA seeks responses from the applicants and ANCBs, where indicated, to provide clarity on the outstanding matters.

3.9.2 With regards to offshore ornithology, NE confirmed at DL5 [REP5-053] that impact values were now available according to both the applicants' and SNCBs' preferred parameters. It accepted the figures presented by the applicant for the impacts of the proposed development 'alone' [REP5-058]. It explained that the remaining concerns related to the in-combination assessment and were unlikely to materially influence the impact assessment conclusions or the calculations of compensation requirements. NE based its DL5 conclusions on the figures provided by the applicant for the impacts of the proposed development alone (using 100% adult apportioning), and in light of its conclusions on other recent projects.

3.9.3 The ExA's understanding of the applicants' and the ANCB's current positions in relation to AEoIs is set out in Tables 1 to 5 of Annex 1 of this RIES.

3.9.4 Note that Table 5 of Annex 1 identifies some European sites with two asterisks (**). These were screened out in Table 4-10 of the HRA Screening Report [APP-049] however the RIAA Part 1 [APP-045, superseded by REP5-007] confirmed that the sites had been subsequently screened in. Impacts on these sites during the non-breeding season were assessed in the RIAA Part 4 [APP-048, superseded by REP4-016]. These sites have not been specifically discussed in the examination to date; however the RSPB [REP5-065] has stated that it was unable to reach conclusions as to the significance of in-combination impacts on those sites. This was due to the use of a "de minimis" threshold of 1% adult mortality on the project alone impacts, whereas any threshold of scale of impact should be set against the total in-combination impact. The RSPB requested PVA be carried out if this total impact is greater than the threshold (1% background mortality for English sites and 0.02% adult annual survival rate for Scottish sites).

RIES Q48: To NE and other ANCBs: The ExA has set out its understanding of the ANCB's positions at the time of publication of this RIES in Annex 1. Please review Annex 1 and provide any corrections if necessary.

4 DEROGATIONS FROM THE REGULATIONS

4.1 Overview

4.1.1 The applicants submitted a derogation case relating to the kittiwake and guillemot features of the FFC SPA and the sandbank feature of Dogger Bank SAC. An overview was provided in Document 6.2 Habitats Regulations Derogation Provision of Evidence [APP-051, revised in REP4-018] which related to both sites.

4.1.2 The applicants' HRA Report concluded no AEoI on the razorbill qualifying feature of the FFC SPA from the project alone, or in-combination with other projects. However, the documents detailed above included a 'without prejudice' derogations case for this feature.

4.1.3 As noted in section 3 of this RIES, at DL5, NE was unable to rule out AEoI for BNNC SAC, Humber Estuary SAC and SNS SAC. In ExQ2, the ExA sought a 'without prejudice' derogations case for these sites and features [PD-022, MM.2.14]. The applicants responded that compensation measures for marine mammal SACs due to disturbance have yet to be required on any DCO project, because impacts have been appropriately managed through the MMMP and SIP. As such, the applicants did not propose to submit a 'without prejudice' derogations case [REP5-036, MM.2.14]. The applicants' response to MM.2.14 did not refer to indirect effects on harbour porpoise of SNS SAC from changes to prey availability, for which NE was also unable to rule out an AEoI.

4.1.4 NE similarly could not rule out an AEoI of the seabird assemblage of the FFC SPA (including with regards to indirect effects) and guillemot of the Farne Islands SPA. These are addressed below in section 4.6.

4.2 Alternative solutions

4.2.1 The applicants provided its 'no alternative solutions' case in section 4 of the Derogation Provision of Evidence [APP-051, revised in REP4-018] which:

- defines the aims and objectives of the proposed development
- includes discussion of the 'do nothing scenario'
- includes information on alternative solutions (including alternative locations, alternative scale, alternative designs and methods, alternative timing), their feasibility and ability to meet the objectives of the proposed development
- concludes that there are no feasible alternatives to the proposed development (and therefore does not undertake a comparison of the alternatives in relation to their potential effects on the European site(s) and feature(s))

4.2.2 No specific concerns were raised by IPs in relation to the applicants' consideration of alternative solutions presented in [APP-051, revised in REP4-018]. However, as noted above, queries were raised with regards to alternative mitigation measures for seabirds (see section 3.2).

4.3 IROPI case

4.3.1 The applicants provided their IROPI case in section 5 of the Derogation Provision of Evidence [APP-051]. It concluded that there is a demonstrable overriding public interest in the proposed development and the policy objectives it will serve, which outweighs the risk of AEoI of the kittiwake, guillemot (and potentially razorbill) features of the FFC SPA and the sandbanks feature of the Dogger Bank SAC.

4.3.2 It confirmed that there are no priority habitats or species being considered for derogations (so economic or social reasons may form part of the IROPI case).

4.3.3 No specific concerns were raised by any IPs in relation to the applicants' IROPI case presented in [APP-051].

4.4 Compensatory measures - introduction

4.4.1 A summary of the proposed compensatory measures and matters discussed during the examination to date is provided below.

4.4.2 The ExA notes that Historic England [RR-022] raised concerns that compensation measures could have an adverse effect on the historic environment, which will need to be assessed. The ExA considers this concern to be outside the scope of this RIES and therefore is not discussed further.

4.5 Compensatory measures – Annex I habitats

Sandbanks of Dogger Bank SAC

4.5.1 Details of the proposed compensatory measures for sandbanks of Dogger Bank SAC were provided in the following application documents:

- Document 6.2.3 Appendix 3 - Project Level Dogger Bank Compensation Plan [APP-059]
- Document 6.2.3.1 Round 4 Dogger Bank Strategic Compensation Plan [APP-060]
- Document 6.2.3.2 Outline Dogger Bank Compensation Implementation and Monitoring Plan (CIMP) [APP-061]
- Document 6.2.3.3 Annex C - Extension of the Dogger Bank SAC for HRA Derogation Compensation – Rationale and Evidence Base [APP-062]

4.5.2 At the application stage, the applicants proposed a new protected site designation or extension (primary measure), to be delivered strategically via a Strategic Compensation Fund such as the MRF [APP-059, section 6.2].

4.5.3 The applicants also proposed the restriction of fishing activities as a potential supplementary measure which would only be progressed should the scale of compensation from new site designation or extension fall short of the required compensation. If necessary and approved as a compensation measure by DEFRA, restriction of fishing activities would be delivered strategically via a Strategic Compensation Fund such as the MRF [APP-059, section 6.3].

4.5.4 Lastly the applicants proposed seagrass meadow restoration [APP-059, section 6.4] as a resilience measure to be delivered alongside one or both of the proposed compensation measures if necessary. This would be delivered either strategically or collaboratively.

4.5.5 The delivery of compensatory measures for sandbanks would be secured through Schedule 18, Part 1 of the dDCO, Part 1 [then APP-027].

Examination

4.5.6 The following matters have been discussed in the examination to date.

Theoretical merit, technical feasibility and effectiveness

4.5.7 NE [RR-039, Appendix D, Table 1] agreed with the theoretical merit, technical feasibility and suitability of new site designation or extension of the existing Dogger Bank SAC. It considered the measure to have the greatest likelihood from an ecological perspective of maintaining the coherence of the NSN.

4.5.8 TWT [RR-057] [REP1-088] also considered site extension to be the only measure that would ensure recovery of Dogger Bank SAC would not be hindered.

4.5.9 NE [RR-039, Appendix D, Tables 2 and 3] [REP1-067] raised several concerns relating to the proposed supplementary measures of reduction in fishing pressures and restoration of seagrass. It did not consider there to be any merit in progressing or relying upon project-specific benthic compensation measures [REP1-063]. At DL2, the applicants updated Project Level Dogger Bank Compensation Plan (Revision 2) [REP2-012] to confirm that a Written Ministerial Statement (WMS) on compensation requirements for offshore wind projects had been issued by DEFRA in January 2025 (with accompanying guidance). The plan confirmed that DEFRA had committed to the delivery of sufficient designations/ extensions to provide strategic compensation for likely benthic environmental impacts resulting from offshore wind developments. As such the applicants confirmed they did not plan to progress the measures further. NE subsequently confirmed their agreement with the removal of the supplementary measures from the project level plan [REP3-052]. Supplementary measures are therefore not considered further in this RIES.

Mechanism for delivery and implementation

4.5.10 The Project Level Dogger Bank Compensation Plan [APP-059] explained that a site designation/ extension would be a strategic measure. It noted that a CIMP would be produced by the applicants and approved by the SoS prior to the start of construction, if required in addition to a plan level Dogger Bank Strategic Implementation and Monitoring Plan. Both the Plan and the CIMP would be secured through Schedule 18, Part 1 of the dDCO, Part 1 [then APP-027]. The applicants submitted an outline Dogger Bank CIMP with the application [APP-061].

4.5.11 NE [RR-039, Appendix D] confirmed that a new site designation or site extension should be provided on a strategic basis and that delivery discussions had commenced between DEFRA, JNCC and Natural England. It noted that monitoring would fall under the responsibility of NE or JNCC, but it expected the costs to be borne by developers requiring compensation through the MRF.

4.5.12 TWT [REP1-088] agreed that DEFRA should lead any site extension designations.

4.5.13 As noted above, the applicants updated the Project Level Dogger Bank Compensation Plan (Revision 2) [REP2-012] to reflect the WMS (DEFRA, 2025) commitment to strategic compensation measures. This noted that a MRF would be launched in late 2025 to provide an optional mechanism for developers to fund strategic compensation.

4.5.14 NE [RR-039, D12] queried whether a Dogger Bank CIMP would be required in addition to the Round 4 Plan Level CIMP. The applicants [AS-048] explained that they had submitted a project level plan in line with their understanding of NE's expectations for the DCO applications. They considered that some form of project level implementation plan would be required. However, NE [REP4-129] considered that the CIMP should be undertaken through the MRF process.

Location

4.5.15 The Project Level Dogger Bank Compensation Plan [APP-059] explained that the identification of candidate sites would be overseen by DEFRA and that further information would be provided post-consent and detailed within the Dogger Bank CIMP (if required). Nevertheless, the applicants submitted information on a possible site extension to the north of Dogger Bank SAC in Annex C – Extension of the Dogger Bank SAC for HRA Derogation Compensation – Rationale and Evidence Base [APP-062].

4.5.16 NE [RR-039, Appendix D] considered there to be "areas of seabed not currently protected which if protected and appropriately managed, could provide similar ecological function to those Annex I features which are likely to be subject to lasting loss/ change and/ or disturbance". It confirmed that the powers to designate site with DEFRA and that the location was still under consideration by DEFRA, NE and JNCC. It did not consider it

necessary or appropriate to discuss the merits of a particular location. TWT [REP1-088] [REP3-069] echoed this advice.

4.5.17 This was acknowledged by the applicants [AS-048], who explained that they had sought to expedite delivery of compensation since the initial stage of the Round 4 Plan Level HRA process and would continue to input to the DEFRA process if requested.

Scale of compensation

4.5.18 The applicants' Project Level Dogger Bank Compensation Plan [APP-059] explained that it would be DEFRA's responsibility to calculate the combined impact for multiple projects and determine the area for which strategic compensatory measures would be delivered. It noted that this may include the application of a compensation ratio or multiplier to the predicated impact and that the Round 4 Dogger Bank Strategic Compensation Plan [APP-060] considered ratios close to 1:1 to be appropriate where confidence in delivery is high. However, it explained that it was not appropriate to apply a compensation multiplier until further information is made available from DEFRA with respect to the strategic delivery of compensation. The Plan confirmed that the scale of compensation would be detailed in the Dogger Bank CIMP (if required).

4.5.19 NE [RR-039, Appendix D, Tables 1 and 4] explained that compensation multipliers were not agreed or signed up to by the SNCBs and would be agreed by DEFRA. TWT [REP1-088] echoed this advice. The applicants [AS-048] considered there is a high degree of confidence for the strategic measure and considered the 1:1 ratio to be appropriate.

4.5.20 As noted in Table 3.2 above, NE [RR-039, Appendix D] [REP1-067 D1 and D2] did not agree with the WCS of permanent habitat loss assessed by the applicants upon which the scale of compensation would be based, in particular with regards to ecological halo effects. In addition, NE [REP5-061, C16, D21] considered that an AEoI would result from abrasion/ disturbance of the seabed within Dogger Bank SAC. It noted that this impact was referred to in the strategic compensation plan [APP-060] and considered that compensation was required for this impact [REP5-061, D21]; a position echoed by TWT [RR-057]. The ExA has sought clarification on these matters at IDs 3.2.2 and 3.2.9 of this RIES.

4.5.21 The applicants [REP4-088] considered the worst-case scenario for habitat loss was reflected in the updated Project Level Dogger Bank Compensation Plan (Revision 3) [REP4-028, Table 5-1]. The updated plan also included the potential footprint of abrasion/ disturbance of the seabed on a without-prejudice basis and justification as to why ecological halo effects had not been quantified.

4.5.22 The applicants [REP4-086] explained that when considering habitat loss only as a contributor to AEoI, an impact of 2km^2 would need to be compensated for. This would rise to 30km^2 if disturbance is concluded to contribute to AEoI. They noted that this order of magnitude difference has financial

implications for the proposed development. They also noted that a 17% increase in habitat loss from the inclusion of jack up activities and UXO clearance would have financial implications, and that consideration would need to be given to other sea users who could be affected by new designations [REP5-037].

4.5.23 LWT [RR-028] did not believe that compensation would be sufficient to address the adverse impact on site integrity. TWT [REP1-088] [REP3-069] [REP5-068] confirmed its concerns were on the quantum, rather than the means of delivery, of an MPA expansion but noted that the responsibility for determining the size of the extension ultimately falls with DEFRA.

Timing

4.5.24 NE [RR-039, Appendix D, Tables 1 and 4] [REP1-067, D3] acknowledged that there would likely be time lags between an impact occurring and compensation achieving the desired outcomes. As such, it requested the applicants' contribution to compensation ensures an overall environmental net positive outcome for the impacted feature over the lifetime of the proposed development.

4.5.25 The applicants updated Dogger Bank SAC Project Level Compensation Plan (Revision 2) [REP2-012] to confirm that the WMS (DEFRA, 2025) "affirms that the Department of Energy Security and Net Zero (DESNZ) Secretary of State and the MMO may consider circumstances where the adverse effect can occur ahead of compensation being in place, though this would need to be considered in the context of other factors that are yet to be defined". The applicants understand that where permitted, a greater amount of compensation is likely to be needed to make up for any time delay and developers will be required to pay into the MRF before any adverse effect can occur".

4.5.26 NE considered that this is a matter for DEFRA and it was not discussed further.

Summary of examination outcomes to date in relation to Annex I habitat compensation

4.5.27 To date in the examination there is agreement between the IPs and the applicants with regards to the type of compensation and mechanism of delivery. NE and the applicants have agreed that the location, timing and quantum of compensation would be for DEFRA to determine [RR-039] [REP5-061]. However, the scale of impacts on which the compensation quantum would be based remains in dispute (see Table 3.2 of this RIES).

4.5.28 The Project Level Dogger Bank Compensation Plan, to be secured through Schedule 18, Part 1 of the DCO, has been revised throughout the examination, with the most up to date version being Revision 3 [REP4-028]. The need for this document is debated by NE, as detailed above.

RIES Q49: To NE: Paragraph 17 of the Strategic compensation measures for offshore wind activities: Marine Recovery Fund interim

guidance, published 29 January 2025 includes a statement that at all stages of the NSIP planning process, as an application progresses, the draft DCO requirements regarding compensation measures may be updated as more clarity on MPA designations and/ or extensions becomes available, and certainty as to the type of compensation which is available and is being delivered increases over time. Are the requirements in the draft DCO [REP5-002] in relation to the strategic compensation for benthic habitats as up to date and as clear as possible based on the latest information available at this time? If not and further clarity could be provided, please state where and suggest wording if possible.

4.6 Compensatory measures – Marine ornithology

4.6.1 The sections below discuss the compensatory measures proposed for kittiwake, guillemot and razorbill of FFC SPA.

4.6.2 As a result of the disagreement over AEoI of the guillemot qualifying feature of the Farne Islands SPA (see paragraphs 3.8.29 to 3.8.30 of this RIES), the ExA requested a 'without prejudice' derogations case from the applicants [PD-014, OR.2.20]. NE [REP5-062, OR.2.19] explained that it did not anticipate an additional derogations case was required. It advised that it could be managed through adjusting the quanta of the existing auk compensation proposals. However, NE noted [REP5-062, OR.2.8] [REP5-059] that Revision 4 of the Guillemot and Razorbill Compensation Plan [REP4-024] did not include impact values and compensation requirements for guillemot at the Farne Islands SPA.

RIES Q50: To the applicants: The applicants are requested to update the Guillemot and Razorbill Compensation Plan to include impact values and compensation requirements for guillemot breeding at Farne Islands SPA.

4.6.3 The ExA similarly asked the applicants to provide a 'without prejudice' derogations case for gannet and the seabird assemblage of FFC SPA [PD-022, OR.2.26]. NE subsequently agreed to no AEoI on gannet alone or in combination [REP5-053], but considered there to be an AEoI on the seabird assemblage.

RIES Q51: To NE: NE explained in [REP5-062, OR.2.26] that compensation requirements for seabird assemblages are typically handled by the species-specific proposals. Can NE explain whether it considers compensation for the seabird assemblage has been sufficiently accounted for?

RIES Q52: To NE: As noted in ID 3.7.4 and ID 3.8.7 of this RIES, NE stated it was unable to rule out AEoI on harbour porpoise of SNS SAC and ornithology features of FFC SPA as a result of indirect impacts on prey species [REP5-053] [REP5-056] [REP5-061, NE12]. Does NE consider the indirect impacts on prey species can be quantified to the

extent that the quantum of compensatory measures required can be identified?

RIES Q53: To NE: What measures does NE consider could be employed to compensate for the indirect impacts on prey species?

Kittiwake of FFC SPA – measures proposed at application stage

4.6.4 Details of the proposed compensatory measures for in-combination collision risk to kittiwake of FFC SPA were provided in the following application documents:

- Document 6.2.1 Appendix 1 - Project Level Kittiwake Compensation Plan [APP-052]
- Document 6.2.1.2 Outline Kittiwake CIMP [APP-054]

4.6.5 As part of their lease conditions, the applicants (along with Outer Dowsing OWF) must also adhere to The Crown Estate's Round 4 Kittiwake Strategic Compensation Plan (KSCP) [APP-053].

4.6.6 At the application stage, the applicants proposed the following primary compensatory measure options for kittiwake:

- A financial contribution towards the management of fisheries to increase prey availability, to be delivered via the Strategic Compensation Fund operated by DEFRA [APP-052, Section 6.2].
- Up to two offshore Artificial Nesting Structures (ANS) to accommodate the predicted upper limit of compensation required at the plan level for DBS West, DBS East and Outer Dowsing. These would be delivered either on a project-led basis, collaboratively with one (or more) OWF developer(s), or strategically via a Strategic Compensation Fund such as the MRF (Section 6.3 of [APP-052]). It submitted a Letter of Intent to demonstrate its commitment to collaborative discussions with Outer Dowsing OWF [APP-055].

4.6.7 The applicants further proposed the use of their existing onshore ANS at Gateshead as a potential supporting or adaptive management measure should it be proven as an effective compensation measure [APP-052, Section 6.4]. This could only be relied upon to deliver a proportion of the kittiwake compensation required for example, to offset any deficit linked to the primary compensation measure (ie offshore ANS).

4.6.8 The delivery of compensatory measures for kittiwake would be secured through Schedule 18, Part 2 of the dDCO. This requires a final kittiwake CIMP (to be based on the strategy within the Kittiwake Compensation Plan to be submitted to the SoS for approval); the measures must be implemented prior to operation of the turbines.

Guillemot and razorbill of FFC SPA – measures proposed at application stage

4.6.9 Details of the proposed compensatory measures for in-combination disturbance and displacement to guillemot of FFC SPA (and potentially razorbill, on a 'without prejudice' basis) were provided in the following application documents:

- Document 6.2.2 Appendix 2 Guillemot and Razorbill Compensation Plan [APP-056]
- Document 6.2.2.1 Annex A - Outline Guillemot and Razorbill CIMP [APP-057]
- Document 6.2.2.2 Annex B - Guillemot and Razorbill Compensation Predator Eradication Control Site Longlist [APP-058]

4.6.10 At the application stage, the applicants primary compensatory measure was for predator eradication/ control for rats (primary measure) at one or more of the sites shortlisted at application stage in Table 5-2 of [APP-056]. Should these not prove suitable, the applicants would investigate options in the Scilly Isles and Scottish sites [APP-056, Table 5-1].

4.6.11 The applicants also considered potential adaptive management measures could be employed should the primary measure prove less effective than the applicants anticipated and if evidence becomes available on their effectiveness. These were as follows:

- provision for suitable nesting locations on the ANS(s) being provided for kittiwake
- bycatch reduction

4.6.12 The applicants anticipated that the measures would be delivered at the project-led level, but options for collaboration with other OWF developers would be explored, as would opportunities for contribution to strategic compensation through the MRF (paragraph 165 [APP-056]).

4.6.13 The delivery of compensatory measures for guillemot (and potentially razorbill) would be secured through Schedule 18, Part 3 of the dDCO [then APP-027]. This requires a final guillemot [and razorbill] CIMP to be produced based on the strategy within the guillemot [and razorbill] Compensation Plan [APP-057] and submitted to the SoS for approval; the measures must be implemented prior to operation of the turbines.

Examination

4.6.14 The applicants' proposed compensatory measures were subject to discussion throughout the examination to date, as summarised below. Matters common to compensation for kittiwake, guillemot and razorbill and detailed below. Feature specific matters are detailed in subsequent sections.

Precaution

4.6.15 The level of precaution applied to determine the compensation quantum, was intrinsically linked to the discussions of precaution in the assessment phase (see section 3.6 above). The applicants [REP3-030] considered that applying precaution at multiple stages of the process leads to disproportionate requirements for compensation and that precaution should only be applied once. In respect of the displacement assessment, they set out the assumptions they considered to be robust, and which provide an element of precaution [REP3-030, section 1.3.3]. They disputed the advice NE had provided in [REP4-124] stating that the compensation calculations are a separate element of the HRA process to the impact assessment and that uncertainties in the likelihood of success of measures must be considered. The applicants' [REP5-037] considered this to be a further example of compounding levels of precaution.

Methods for determining the level of required compensation: Hornsea 3 or 4

4.6.16 NE [REP1-065] described two methods for determining the level of compensation required as follows:

- Hornsea 3 Part 2 method ('new colony approach') – this calculates the number of birds needed to replace those lost at the impacted site, and the number of adults that need to be produced by a colony to sustain itself, as opposed to drawing birds out of the wider population to do so.
- Hornsea 4 method – this solely looks at the number of birds needed to replace those lost and does not incorporate the need for the colony to sustain itself.

4.6.17 For kittiwake, the applicants' Project Level Kittiwake Compensation Plan [APP-052, Section 5] determined the level of compensation required using both methods. However, the applicants considered the Hornsea 3 Part 2 method unsuitable due to its complexity and potential for double-counting of the effects of mortality. NE [RR-039, Annex H1] [REP1-065] [AS-160] [REP4-124] considered the Hornsea 3 Part 2 approach to be the most ecologically realistic. The RSPB agreed with NE [AS-173]. However, the applicants noted the method is not publicly available so cannot be easily replicated or quality assured [PDB-006] [AS-158] [REP3-027, OR.1.15] [REP3-030] [REP4-020].

4.6.18 Guillemot and razorbill - the applicants used the Hornsea 4 methodology to determine the level of compensation required in Sections 4.5.1.5 and 4.5.2.5 of the Guillemot and Razorbill Compensation Plan [APP-056], respectively. NE [REP3-057, OR.1.1.12] agreed with the use of the Hornsea 4 method (provided that this is based on the 95% upper confidence limit impact values and an appropriate compensation ratio is applied to address the uncertainty of success).

4.6.19 NE further advised [AS-160] [REP4-124] that an independent report on compensation calculation methods had been commissioned from the British

Trust for Ornithology (BTO). The applicants [REP3-027, OR.1.17] confirmed they would review the methodology and apply it to their data should it become available during the Examination within a reasonable time frame.

Presentation of confidence intervals

4.6.20 NE [RR-039] [AS-160, Appendix H2] [REP1-065] [REP3-057, Annex A] [REP4-124] explained that surveys are spatially restricted and only cover a small proportion of the project area. It therefore consistently advised that seabird compensatory measures be scaled against the 95% upper confidence limit predicted impact value, rather than the central impact value. They stated that this would give confidence that the compensatory measures can provide sufficient benefit, should impacts exceed those of the central prediction. It acknowledged that this could result in large compensation quanta for some species and that a pragmatic interpretation of calculations may be needed.

4.6.21 The RSPB [REP4-113] agreed with NE's recommendation to present confidence intervals.

4.6.22 However, the applicants [AS-158] [REP3-030] considered the mean to be the most appropriate to use as it is the most likely value for bird abundance. They explained that using the upper 95% confidence interval effectively doubled the mortality compared to the mean value and that all compensation documents should retain the range of outputs so the SoS can make an informed judgement. They did not agree that that the Hornsea 4 method should be based on the upper 95% confidence interval estimates combined with compensation ratios of greater than 1 and considered that combining sources of precaution in this manner is disproportionate and results in highly inflated compensation requirements [REP3-030] [REP4-087]. The applicants highlighted that providing compensation measure scaled to the value derived from the upper 95% confidence interval would represent a considerable cost increase [REP3-057].

4.6.23 The applicants identified the approaches used by various OWFs in [REP3-027, OR.1.14], stating that the majority of projects presently in examination phase supported calculated compensation requirements using the mean. However, they subsequently presented both the mean and the upper 95% confidence limits in its revised documents. In respect of guillemot and razorbill, the Outline CIMP [REP4-026] stated that the compensation requirements would be based upon the mean impact value, but that compensation measures should have the capacity to accommodate the requirements based upon the 95% upper CI. NE [REP5-059] confirmed its agreement with this approach.

Examination – kittiwake of FFC SPA

4.6.24 The following matters specifically relevant to kittiwake compensation have been discussed in the examination to date.

4.6.25 The proposed financial contribution towards the management of fisheries to increase prey availability was identified as the applicant's preferred compensation measure in Revision 5 of the Project Level Kittiwake Compensation Plan [REP4-020]. However, this also noted there is uncertainty as to whether this strategic option would be available. This measure was not discussed during the examination and the discussions below relate to the proposed ANSs only.

Theoretical merit, technical feasibility and effectiveness

4.6.26 NE [RR-039, Annex H1] agreed an offshore ANS (oANS) had merit and is technically feasible. It was not opposed to an onshore ANS, however considered the extent of benefit it could provide would be limited [REP3-055]. It considered [REP3-055, Annex 1] that insufficient evidence had been provided to demonstrate certainty of success of the compensation. It queried whether delivery was achievable over the lifetime of the proposed development. Furthermore, NE [REP3-055] highlighted the importance of adaptive management measures to ensure that compensation requirements could be delivered should primary measures fail.

4.6.27 The RSPB [RR-049] [REP1-087] [REP3-066] stated that ANSs (onshore or offshore) are yet to be proven as effective compensation measures and that onshore ANS's have been implemented without sufficient evidence of a nest-limited kittiwake recruit pool. It noted low or no colonisation levels of existing ANS's. The RSPB's preference of the proposed options was for an oANS.

4.6.28 TWT [REP3-069] did not support ANS as a compensation measure for impacts on kittiwake.

4.6.29 The applicants highlighted [REP4-087] that the development of oANS is considered to be the most ecologically appropriate compensatory measure for offsetting impacts on kittiwake in English waters as outlined by DEFRA (DEFRA's letter to OWIC, 2024). They confirmed [REP4-088] they would use best available evidence to maximise the chances of colonisation through site selection and design.

4.6.30 The applicants also [PDB-006] noted that the onshore ANS installed at Gateshead in 2023 ahead of publication of the Round 4 KSCP [APP-053] was showing positive signs of colony establishment. The applicants confirmed [REP5-036, OR.2.16] that whilst they are in discussion with other projects regarding sharing the onshore structure, they currently wholly own the structure which provides nesting spaces for over 240 pairs of birds with the potential to double the nesting capacity through the addition of barn doors. The potential use of the Gateshead onshore ANS remained in Revision 5 of the Project Level Kittiwake Compensation Plan [REP4-020].

4.6.31 At DL2, the applicants stated the full compensation would be achieved between 16 and to 36 years to compensate for impacts [REP2-060]; however this was later revised to between 13 and 50 years [REP4-083]. NE [REP3-055, Annex 1] noted that this contradicts with the proposed development's lifespan of 30 years and raised doubt on the ability of the

proposed development to compensate for their predicted impacts even within 50 years [REP5-062, OR.2.17] [REP5-059].

4.6.32 The applicants acknowledged [REP4-088] that in the extreme worst cases (using the 95% UCI and most precautionary growth rates) the mortality would never be offset: however, they considered that the success criteria should be based on the mean annual mortality. They confirmed that success criteria would be in line with categories outlined in section 12 of the Round 4 KSCP [APP-053] and would be defined in detail post-consent in the Kittiwake CIMP.

4.6.33 Section 4.4 of the revised Outline Kittiwake CIMP [REP4-022] was amended to confirm that the applicants would "consider extending their monitoring and maintenance commitments for the oANS to a later date until compensation requirements are delivered as adaptive management". The applicants [REP5-036] considered the Kittiwake CIMP to be the appropriate means to secure this potential adaptive management and that such a commitment was not necessary, proportionate or practical to secure within the DCO. However, NE [REP5-062, OR.2.17] highlighted previously consented DCO schedules include a condition to be included requiring written permission from the SoS to decommission an ANS. The RSPB [REP5-065, OR.2.17] advised such a requirement be included within the DCO.

4.6.34 With regards to technical feasibility of ANSs, the RSPB [AS-128] [PDB-012] [REP1-087] noted the potential for risks associated with the supply chain, construction logistics and implications for meeting implementation commitments ahead of first turbine operation. It highlighted Hornsea 4 OWF's recent change from an oANS to onshore ANS. The applicants [REP3-027, OR.1.24] confirmed that an assessment of risk and contingencies was ongoing, but stated an oANS would open up a larger and different supply chain to turbine and foundation structures.

Mechanism for delivery and implementation

4.6.35 The applicants Project Level Kittiwake Compensation Plan set out three possible delivery mechanisms [APP-052, Section 6.3.3]: collaboratively; project-led; or strategically (e.g. via a future MRF as and when that is implemented by the government). The applicants' preference was for a collaborative approach with other OWF developers and NE [RR-039, Annex H1] sought clarity on such an approach.

4.6.36 The applicants confirmed [PDB-006] [REP3-027, OR.1.21] [REP3-028] that they and ODOWF would each progress one project-led oANS, with the potential for nesting space from each other's ANS to be shared between the parties to present reciprocal resilience across the compensation measure. They confirmed that a Memorandum of Understanding (MoU) between the applicants and ODOWF had been agreed and signed regarding a collaborative approach to ANS. The applicants confirmed that should the delivery of collaborative or strategic measures fall away, they would deliver the compensation measures as required for the proposed development.

4.6.37 The applicants [AS-158] explained that final details of location, capacity, design, and monitoring would be provided in the Project Kittiwake CIMP which has to be agreed by the Kittiwake Steering Group post consent. It submitted an Outline Kittiwake CIMP [APP-054] with the application, and NE [RR-039] considered there to be very little detail regarding the long-term implementation and maintenance of the compensatory measures, nor monitoring or adaptive management. It further noted [AS-161, H17] that following the publication of the WMS (DEFRA, 2025) confirming that oANS should be delivered at a project level, a populated CIMP should be submitted, advising that it includes a detailed monitoring proposal and details of adaptive management approaches [REP3-055].

4.6.38 The applicants noted [REP3-028, Table 2-14] that CIMPs are typically developed post-consent in collaboration with steering groups. Nevertheless, they submitted further details of monitoring plans and adaptive management measures within Revision 2 of the Outline Kittiwake CIMP [REP4-022]. Furthermore, they updated Schedule 18 Part 2 of the dDCO [REP4-005] to reflect the existence of the outline CIMP.

4.6.39 NE [REP5-059] welcomed the updates however advised further detail be provided in future versions of the CIMP.

Location

4.6.40 The applicants identified a shortlist of five possible locations in the Project Level Kittiwake Compensation Plan [APP-052, Section 6.3.4]. NE provided comments on each location in [RR-039, Annex H1], specifically noting that location ‘F’ overlapped with Impacts on North Norfolk Sandbanks and Saturn Reef (NNSSR) SAC, and if retained, information to inform an Appropriate Assessment provided. The applicants subsequently confirmed the removal of the area of overlap with NNSSR SAC in the Project Level Kittiwake Artificial Nesting Structure (ANS) Site Selection report [PDB-007] and Revision 2 of the Project Level Kittiwake Compensation Plan [PDB-002].

4.6.41 The applicants’ Project-Level Kittiwake Artificial Nesting Structure (ANS) Site Selection Report [PDB-007] built on the initial site selection work. This identified new Areas of Search (AoS) for an oANS and assessed the suitability of repurposing offshore infrastructure due to be decommissioned. NE provided advice on the site selection report in [AS-160] (which was supported by the RSPB [REP3-066]) and noted that there was a lack of detail regarding the elimination of three originally shortlisted AoS [REP3-055].

4.6.42 Version 4 of the applicants’ Project-Level Kittiwake Compensation Plan [REP2-010] subsequently identified three candidate sites to take forward for site investigation surveys in 2025. The applicants confirmed [AS-158] [REP2-057] [REP4-086] that one or two locations would be taken forward to Marine Licence application, prior to the end of the examination.

4.6.43 NE provided further comment on site selection and matters for consideration at DL5. It noted [REP5-062, OR.2.15] [REP5-059] that it had advised the

applicants to consider the potential for increased risk of collision mortality to kittiwake colonies should the oANS be located in Area of Search 4, which could reduce the predicted recruitment back into the population. The RSPB [REP5-065, OR.2.15] echoed this advice. NE also stated [REP5-061] that is was unclear how its previous advice on site refinement had been considered.

4.6.44 The applicants [REP5-036, OR.2.15] explained that site selection had incorporated a 15km buffer to areas of hard constraints including OWFs, which they considered applies a suitable level of precaution to reduce risk to birds using the ANS.

4.6.45 As of DL5, the site location was not determined. The applicants confirmed [REP5-036] they would be meeting with NE post DL5 to discuss the selection for the preferred ANS candidate site location.

RIES Q54: To the applicants: Paragraph 19 of the Strategic compensation measures for offshore wind activities: Marine Recovery Fund interim guidance, published 29 January 2025 states that where possible, applicants should ensure that larger and fewer offshore artificial nesting structures are placed in optimal sites and that enhanced monitoring to test the efficacy of offshore artificial nesting structures should be put in place. Can you explain how your proposals meet these aspects of this guidance. Cross references to paragraphs within existing submission documents is fine.

Scale of compensation

4.6.46 The Project Level Kittiwake Compensation Plan [APP-052] proposed up to two oANS being provided (one project-led), each with a maximum capacity of 2,250 nesting spaces; this was stated to be in accordance with the Round 4 KSCP [APP-053].

4.6.47 The applicants [REP3-027, OR.1.22] [REP3-028, Table 2-14] considered that their project-led structure would provide sufficient nesting space to accommodate the proposed development's compensation requirements and that the second oANS (by ODOWF) was not required for the delivery of sufficient nesting spaces but would provide additional security. They explained [REP4-020] that the ANS would be modular until the point of fabrication, allowing flexibility for scaling the number of nesting spaces to cover the full range of estimates presented in the Project Level Kittiwake Compensation Plan.

4.6.48 Applying the Hornsea 3 Part 2 method and assuming 100% adult apportionment, Revision 5 of the Project Level Kittiwake Compensation Plan [REP4-020, Table 5-1] detailed compensation requirements as follows (number in brackets are the upper 95% CI):

- 1:1 ratio: 1,056 (2,086) pairs (reduced to 510 (1,007) using the Hornsea 4 method)

- 2:1 ratio - 2,112 (4,172) pairs (reduced to 1,021 (2,015) using Hornsea 4 method)
- 3:1 ratio: 3,168 (6,258) pairs (reduced to 1,530 (3,021) using Hornsea 4 method)

4.6.49 NE [REP5-059] explained that it was unable to replicate the figures produced by the applicants in [REP4-020], although it did note that there is no 'official' protocol for this method. It also noted that whilst the applicants confirmed that these figures remained within the compensation envelope outlined in The Round 4 KSCP [APP-053], the compensation envelope estimated within the KSCP was based on lower impact predictions than were subsequently submitted.

4.6.50 NE [RR-039, Annex H1] [AS-126] [REP1-065] [REP5-059] [REP5-061] disagreed with the scale of impacts or compensation required. It considered that, in the event of ODOWF not progressing, one oANS would likely be insufficient to meet the project's needs alone. It also considered that two oANSs would be insufficient to compensate for the proposed development combined with ODOWF. It advised that uncertainty regarding the success of compensation should be taken into account and provided guidance on calculating the number of breeding pairs required. It confirmed that it did not support a compensation ratio of 1:1. However, it could not advise on an appropriate ratio until specific details of location, number of nesting spaces and design were provided [REP3-057] [REP5-059] [REP5-061]. Likewise, the RSPB stated it could not advise on ratios until further details were provided [AS-173, OR.1.15].

4.6.51 NE [REP3-055, Annex 1] also sought further information on modelling approaches used to determine growth rates and assess the likely timescales for the oANS to deliver compensation. It advised that: a productivity of 0.8 should not be considered a WCS; a delayed colonisation period be considered; and growth rates may need to be revisited. The applicants provided further detail in Revision 2 of the 'Case for Reduction in Kittiwake Breeding Seasons for ANS Installation' [REP4-083]. However, NE [REP5-062, OR.2.17] [REP5-059] responded that the population modelling had not applied either the Hornsea 3 Part 2 or Hornsea 4 method for calculating the number of breeding pairs of kittiwake required to compensation for impacts, nor had they applied any compensation ratios. It also noted that the impacts of delayed colonisation had still not been considered by the applicants (see below re timing for more information).

RIES Q55: To the applicants: Can the applicants provide the population modelling results for the compensation requirements of the proposed development, according to the SNCB-advised approach?

Timing

4.6.52 The applicant's Project Level Kittiwake Compensation Plan [APP-052, Section 6.3.6] initially stated that in order to allow sufficient time for the

recruitment of juveniles to the adult population, a project-led oANS would be installed a minimum of three breeding seasons prior to first turbine operation. They noted that they were prioritising the delivery of at least one oANS in collaboration with other OWF developers which could be implemented no less than four breeding seasons prior to operation. It also considered that should there be a delay to the implementation and delivery of an oANS, any compensation deficit (mortality debt) accrued would be small enough to be paid off over the lifespan of the proposed development, or that the scale of compensation could be increased, or alternative measures could be relied on to offset any deficit accumulated.

4.6.53 NE [RR-039, Annex H1] advised that kittiwake do not breed until they are 4+ years old and therefore it is unlikely an ANS would deliver compensation at the scale required prior to impacts occurring. Both NE and the RSPB [RR-049] advised an oANS should be implemented to allow for four full breeding seasons before operation of the turbines. The RSPB [REP1-087] also advised that the compensation measures be secured for the lifetime of the development plus the time it would take the affected seabird population to recover from the impacts.

4.6.54 The applicants subsequently proposed to reduce the time period for delivery to two years in advance of operation, noting that this had been proposed for other OWFs [AS-158] [REP2-010] [REP2-057]. They submitted ‘Case for Reduction in Kittiwake Breeding Seasons Prior to Artificial Nesting Structure Installation’ [REP2-059] to provide the rationale for this reduction. This concluded that four breeding seasons compared to two over the course the proposed development’s lifespan (and beyond) would be insignificant and would not materially impact the ability of the ANS to deliver the compensation requirement but would delay delivery of compensation by two years.

4.6.55 NE [REP3-055] considered that insufficient evidence had been provided to demonstrate that such a change would not result in significant additional impacts. It highlighted the potential for mortality debt to occur from a failure to have compensation measures in place sufficiently before the projects are operational or if the oANS takes a significant period of time to become colonised.

4.6.56 Similarly, the RSPB [REP3-066] considered four breeding seasons in advance of first operation was appropriate to manage down risks.

4.6.57 The applicants [REP4-086] [REP4-087] [REP4-088] explained that it would be extremely difficult to deliver the structure ahead of Q4 2027 and that care was required during the design. They stated that delivering an oANS four years in advance of first possible operation would require installation in Q1 2025, prior to consent being granted. They considered four breeding seasons becomes less relevant when considering the quantum of mortalities on this project and that fact that the oANS would take over 13 to 37 years to deliver full compensation under current projections. Furthermore, the applicants noted they had already installed an onshore nesting structure at

Gateshead in 2023 - a full seven breeding seasons ahead of first possible operation for the proposed development - with the intention that it could contribute to compensation and avoid the accrual of mortality debt in advance of operational impacts. This information was captured in Revision 2 of the 'Case for Reduction in Kittiwake Breeding Seasons Prior to Artificial Nesting Structure Installation' [REP4-083].

4.6.58 NE [REP5-062, OR.2.17] [REP5-059] did not agree that uncertainties regarding the ability of the proposed measures to sufficiently compensate for the impacts of the proposed development were an appropriate reason for reducing the lead-in times to installation; rather they supported the need for installation of the oANS as soon as possible in advance of operation.

4.6.59 As of DL5, there remained disagreement regarding the timescales for implementing the proposed compensation.

Examination – razorbill and guillemot of FFC SPA

4.6.60 The following matters specifically relevant to razorbill and guillemot compensation have been discussed in the examination to date.

Theoretical merit, technical feasibility and effectiveness

4.6.61 The Guillemot [and Razorbill] Compensation Plan [APP-056] explained that the SoS for DEFRA approved predator eradication as a compensatory measure for inclusion within the library of strategic compensatory measures (LoSCM). The applicants [REP2-057] considered that this demonstrated that the UK Government has confidence in this compensation measure.

4.6.62 NE [RR-039, Annex H1] considered predator eradication to be theoretically possible, however noted that evidence of its effectiveness for guillemot and razorbill was limited. It noted that success criteria had not been detailed. It considered the proposals to be poorly developed with very little detail within the Outline Guillemot [and Razorbill] CIMP [APP-057].

4.6.63 The RSPB [RR-049] [AS-128] [REP1-087] considered there to be considerable uncertainty as to predator eradication as a compensation measure for guillemots and razorbill. It advised that there needed to be: evidence of Invasive Non-Native Species predation and their resultant detrimental effect; evidence the measure could be implemented and maintained; and evidence that the seabird species would respond positively to the measure.

4.6.64 The applicants confirmed [PDB-006] that success criteria of predator eradication would be defined in detail post-consent in the Guillemot [and Razorbill] CIMP. Metrics would include colony counts, productivity monitoring and monitoring of predator presence and biosecurity.

4.6.65 With regards to the potential adaptive measures, the applicants [REP3-027, OR.1.32] considered sufficient capacity exists in the fishing fleet for bycatch reduction technology (looming eye buoys). However, NE [RR-039] [REP3-057, OR.1.32] considered there to be insufficient evidence on the efficacy of

bycatch reduction techniques to determine the number of vessels that would be required. It agreed with the applicants [AS-089] that the measure being implement would be reliant on further evidence becoming available. The RSPB [REP1-087] highlighted a lack of evidence about whether these measures would be ecologically effective for guillemot or razorbill.

Mechanism for delivery and implementation

4.6.66 The application version of the Guillemot and Razorbill Compensation Plan stated that predator eradication would be project-led [APP-056, Section 5.3.1.3]. It explained that the applicants would seek to sign up fishers to deliver by-catch reduction measures [APP-056, Section 5.4.2.4] and confirmed that the applicants would look to incorporate provision for suitable nesting locations for guillemot (and razorbill) on the ANS(s) being provided for kittiwake [APP-056, Section 5.4.1]

4.6.67 The applicants provided details of implementation and monitoring in the Outline Guillemot [and Razorbill] CIMP [APP-057]. NE [RR-039] considered there to be insufficient detail in the document and, following publication of the WMS (DEFRA, 2025) confirming that predator eradication should be progressed initially at a project level, advised that a populated CIMP should be submitted [AS-161, H30].

4.6.68 The applicants noted [REP3-028, Table 2-14] that CIMPs are typically developed post-consent in collaboration with steering groups. Nevertheless, they submitted further details in Revision 2 of the Outline Guillemot and Razorbill CIMP [REP4-026]. Furthermore, they updated Schedule 18 Part 3 of the dDCO [REP4-005] to reflect the existence of the outline CIMP. NE [REP5-061] welcomed the additional detail, particularly the inclusion of seabird monitoring.

4.6.69 The application version of the Guillemot and Razorbill Compensation Plan [APP-056] explained that the applicants would consider contributing to strategic mitigation through the MRF, should it become available. The Wildlife Trusts (TWTs) [RR-057] [AS-047] [REP1-088] [REP3-069] supported a strategic approach to compensation wherever possible. It explained it had worked with the Isles of Scilly Wildlife Trust to develop a long-term predator eradication programme on the Isles of Scilly (to benefit multiple bird species). It explained that they could only take predator eradication forward on the islands as a strategic compensation measure to be funded by the MRF, once established. It could not accept payment direct from applicants. The RSPB [RR-049] [AS-128] [REP1-087] agreed that predator eradication on the Isles of Scilly should be considered as a strategic compensation measure.

4.6.70 The applicants [AS-158] agreed that strategic compensation was the most appropriate approach on the Isles of Scilly and confirmed that they were exploring an interim mechanism pending clarification of MRF timescales. They explained [REP4-086] [REP4-087] that government guidance ‘Strategic Compensation Measures for Offshore Wind Activities: Marine Recovery Fund interim guidance (January 2025)’ confirmed that strategic measures

secured through the MRF cannot be relied on for consent at this time and must be provided alongside project-led measures. They considered [REP2-057] that a detailed eradication programme on the Isles of Scilly is unlikely to be developed by TWT prior to the close of examination. Revision 5 of the Guillemot and Razorbill Compensation Plan [REP5-011] confirmed that Middle Mouse would remain under consideration as a project-led option (or in collaboration with another developer) to deliver all or most of the compensation required, or as an interim measure until a strategic route is available. See below for further details regarding potential compensation site location.

4.6.71 The applicants further highlighted [REP3-027] [REP3-028] a joint statement by DEFRA, DESNZ, NE, TWT, RSPB, The Crown Estate and the Offshore Wind Industry Council (OWIC) confirming a strategic approach at the Isles of Scilly would be delivered in Spring 2027. This was also acknowledged by TWT [REP3-069]. The applicants provided an update on the programme of works in [REP5-037], which they considered provided confidence that a suitable strategic compensation option would become available.

RIES Q56: To the applicants: Can the applicants explain how their latest auk compensation proposal [REP5-011] fulfils paragraphs 22 and 25 from the strategic compensation measures for offshore wind activities: Marine Recovery Fund interim guidance, published 29 January 2025?

Location – applicant's short list (project-led option)

4.6.72 The Guillemot [and Razorbill] Compensation Plan [APP-056] and Guillemot and Razorbill Compensation Predator Eradication Control Site Longlist [APP-058] identified eight sites which would later be shortlisted using the UK Rodent Eradication Best Practice Toolkit. This list was reduced to two in the 'DBS Guillemot and Razorbill Compensation Site Shortlist Refinement Report [PDB-008]'. At DL5 the applicants confirmed that a single project-led site location remained at Middle Mouse. This was confirmed in Revision 5 of the Guillemot and Razorbill Compensation Plan [REP5-011].

4.6.73 The applicants [REP3-027, OR.1.30] [REP4-024] explained that initial surveys to determine the presence of rats at Middle Mouse were inconclusive. Further surveys were proposed (scheduled for after close of examination to avoid seabird breeding season) to gather evidence on impacts that predators are having on razorbill and guillemot. The RSPB [REP5-066] stated that robust evidence was required to demonstrate rat presence during the breeding season and that it is affects the breeding guillemot and razorbill populations at Middle Mouse. TWT [REP3-069] did not consider Middle Mouse as being suitable for compensation through predator eradication due to its proximity to the mainland.

4.6.74 The applicants provided an estimate of the amount of nest spaces that could be 'freed up' by the eradication of rats, excluding currently unoccupied areas which are unlikely to be subject to pressures from rodents (e.g. sheer cliffs)

in Revision 2 of the 'Guillemot [and Razorbill] Compensation Site Shortlist Refinement Report' [REP3-019].

4.6.75 Applying their preferred displacement and mortality rates, the applicants considered that Middle Mouse would have sufficient compensation capacity to provide 100% of the project level compensation based on the higher estimate of available habitat, using a density of 46 pairs/m^2, but not when using the more conservative estimate of available habitat, based on a density of 20 pairs/m^2.

4.6.76 NE [REP4-125] [REP4-126] [REP5-059] had concerns with the methods used to estimate the area of suitable habitat and the number of breeding pairs that could be accommodated, particularly for razorbill in [REP3-019]. It considered the potential nesting densities used for guillemot may be unrealistically high and noted that the calculated space available is not a guarantee that it will be fully utilised. Furthermore, it considered that the applicants' figures for estimated compensation potential may require unfeasible colony growth rates and had not considered factors such as likely recruitment and productivity rates, the quantity and quality of available prey, and the current levels of suppression by rats. It also advised the applicants to consider the three-dimensional nature of the areas being assessed, taking into account sloping areas which could preclude nesting [REP5-059].

4.6.77 The applicants [REP5-036, OR.2.9] [REP5-037] stated that feasibility studies had recorded high densities of guillemots in multiple locations. They therefore did not consider nesting densities of over 40 pairs/m^2 to be unrealistic. They noted the Hornsea Project 4 Guillemot CIMP was approved by Natural England based upon predicted nesting density of 27 pairs/m^2. Furthermore, they considered the Lundy growth rate they had applied for guillemot to be appropriate.

4.6.78 With only Middle Mouse remaining as a project-led option, Revision 5 of the Guillemot and Razorbill Compensation Plan [REP5-011] stated that the applicants will revisit the initial site longlist [APP-058] and consider new sites, including those in Scotland.

Location – Isles of Scilly (strategic option)

4.6.79 The applicants initially stated [AS-158] [REP2-057] that should its shortlisted sites not be available or deliver the required amount of compensation, it would make use of the strategic scheme at the Isles of Scilly. As noted above, Revision 3 of the Guillemot and Razorbill Compensation Plan [REP4-024] identified the Isles of Scilly as the most suitable site for predator eradication, noting it could only be progressed via a strategic route.

4.6.80 NE [RR-039, Annex H] [AS-126] acknowledged a history of rat presence and past eradication efforts on the Isles of Scilly. At DL4, NE [REP4-129] advised that given the scale of potential impacts, the applicants' auk compensation would be dependent on the strategic delivery on the Isles of Scilly. However, it considered that progress on this site during the examination would be unlikely [REP4-126].

4.6.81 The applicants submitted the 'Isles of Scilly Guillemot and Razorbill Survey and Habitat Assessment' [REP4-097] at DL4, detailing the survey data and rat-free nesting space projections. They confirmed [REP5-036, OR.2.9] that work was progressing by the Isles of Scilly Seabird Recovery Partnership and the DEFRA Task and Finish group to quantify the benefits of a rat eradication on the Isles of Scilly to seabirds.

4.6.82 NE [REP5-062, OR.2.13] agreed the site has considerable potential as a compensation eradication site, but it advised caution regarding the estimates of the compensation potential of the site until the results of the Isles of Scilly Task and Finish group were available. It stated [REP5-062, OR.2.14] that it had several issues with the methods used by the applicants to estimate the compensation potential of the Isles of Scilly.

Location – connectivity of site options

4.6.83 NE [RR-039, Annex H1] noted that impacts are likely to be felt at the wider biogeographic level rather than the impacted site. It requested an assessment of potential connectivity between candidate compensation sites and the FFC SPA and the wider NSN for guillemot and razorbill [PDB-011]. A connectivity assessment was provided by the applicants in Revision 3 of the Guillemot and Razorbill Compensation Plan [AS-089]; this acknowledged that connectivity with auks at FFC SPA is unlikely from Middle Mouse or the Isle of Scilly due to the distances involved but considered there to be potential for some connectivity with the NSN. NE [AS-160] [AS-161] agreed with this conclusion but noted that connectivity was likely to be limited and should be reflected in the level of compensation provided.

4.6.84 The applicants subsequently considered that increases in the Middle Mouse guillemot and razorbill populations could contribute to the Skomer, Skokholm and the Seas of Pembrokeshire SPA, as it is within the natal dispersal range [REP5-011].

4.6.85 As of DL5, the site location was not determined, with project led and strategic options being reviewed.

Scale of compensation

4.6.86 NE [RR-039, Annex H1] initially commented that it would not be possible to agree impact levels requiring compensation until an assessment of effects was provided in line with SNCB guidance. It also stated that the applicants had not provided sufficient detail on the methods used to estimate compensation requirements. RSPB [RR-049] echoed this advice.

4.6.87 NE confirmed [REP4-124] that it would generally advise 70% displacement and 2% mortality rates for calculating compensatory requirements for auks. The applicants [AS-158] considered that all compensation documents should retain the range of outputs (ie a range of displacement and mortality rates) so the SoS could make an informed judgement. Furthermore, they considered quantum should be determined by the use of mean values based on 50% displacement and 1% mortality rates [REP3-030] [REP3-027, OR.1.30].

4.6.88 Nevertheless, the applicants presented revised predicted operational impacts at DL4, applying both the applicants' and NE's preferred displacement and mortality rates, apportioning, and a range of compensation ratios. These were presented in Revision 4 of the Guillemot and Razorbill Compensation Plan [REP4-024, Tables 4-3 and 4-4].

4.6.89 The applicants maintained a high confidence in the measure for auks and proposed a compensation ratio of 1:1 [REP3-057]. NE [RR-039, Annex H1] [REP1-065] [AS-160] considered it unlikely it would advise a compensation ratio of 1:1 is appropriate. It considered [REP4-124] that greater uncertainty exists regarding the likely success of auk compensation measures than for kittiwake and that the applicants' suggestion of a 1:1 ratio fails to take into consideration the uncertainties associated with the potential success of the proposed measures. It stated it was currently unable to advise on appropriate compensation ratios until specific details of compensation measures are provided. The RSPB echoed this advice [AS-173, OR.1.15].

4.6.90 NE [REP5-062, OR.2.12] [REP5-058] later confirmed it was content with the impact and compensation values presented for guillemot at FFC SPA, but advised the applicants to revise their calculations for razorbill compensation requirements at FFC SPA.

RIES Q57: To the applicants: Can the applicants revise the compensation requirements for razorbill in the Guillemot and Razorbill Compensation Plan, as suggested by NE?

Timing

4.6.91 The applicants proposed to begin predator eradication two years prior to installation of the first turbine [PDB-006] [REP5-011]. They acknowledged [REP4-024] [REP5-011] that eradication on the Isles of Scilly may not be implemented two years in advance of turbine installation and as such there would be a need to overcompensate to account for any delay.

4.6.92 NE [RR-039, Annex H1] advised that eradication might take longer, and that compensation would not be delivered until the required number of chicks were being produced and had reached age of first breeding. It did not consider implementation before impact to be analogous to delivering compensation before impact. NE [REP5-062, OR.2.14] explained that at present it is unclear to what extent predator eradication could address the build-up of mortality debt accrued should the proposed development be operational without effective compensation in place.

RIES Q58: To the applicants: In the event that a delay was incurred to the delivery of effective compensation, how would the applicant address the risk of the accrual of mortality debt? Can you suggest wording for a draft requirement in the DCO that would adequately address this issue?

Second Generation Anti-Coagulant Rodenticides (SGARs)

4.6.93 The RSPB [AS-128] [REP1-087] highlighted that the use of SGARs in open areas would become illegal as of 1 January 2025; this could affect predator eradication measures.

4.6.94 The applicants [REP2-057] acknowledged the concern. They explained that they would carry out a diligent rodenticide selection process. Should approval be required, they would best practice and precedent (including that followed successfully for the derogation to use rodenticide on the Rathlin Island rat eradication project by the RSPB and its consultants) and work alongside the preferred supplier(s), the Campaign for Responsible Rodenticide use (CRRU), and the Health and Safety Executive to seek approval (a Critical Situation Permit) to use the preferred product(s).

Summary of examination outcomes to date in relation to marine ornithology compensation

4.6.95 To date in the examination, the proposed compensatory measures remain unconfirmed in respect of location and scale and disputed in respect of timing for kittiwake, guillemot and razorbill.

4.6.96 The applicants' key documents to be certified in the dDCO have been revised during the examination to reflect the updated impact assessment values and proposed compensation measures. These included presentation of the required quantum of compensation using both the applicants and NE's preferred approaches. The most up to date versions are as follows:

- Document 6.2.1 Appendix 1 - Project Level Kittiwake Compensation Plan (Revision 5) [REP4-020]
- Document 6.2.1.2 Outline Kittiwake CIMP (Revision 2) [REP4-022]
- Document 6.2.2 Appendix 2 Guillemot and Razorbill Compensation Plan (Revision 5) [REP5-011]
- Document 6.2.2.1 Annex A - Outline Guillemot and Razorbill CIMP (Revision 2) [REP4-026]

ANNEX 1 EXA'S UNDERSTANDING OF POSITION AT POINT OF RIES PUBLICATION

4.6.97 The tables in this Annex summarise the ExA's understanding of the applicants' screening exercise and assessment of effects on integrity, and agreement with the relevant ANCB(s) at time of publication of this RIES.

Key to tables:

C = Construction

O = Operation

D = Decommissioning

? = Unclear

n/a = not applicable

Table 1: Terrestrial ecology and ornithology

European site	Qualifying feature screened in	LSE pathway	Does NE agree to no AEoI?
Humber Estuary SPA and Ramsar site	Breeding bird species: Great bittern Common shelduck Hen harrier Pied avocet European golden plover Red knot Dunlin Ruff Black-tailed godwit Bar-tailed godwit Common redshank Non-breeding bird species: Eurasian marsh harrier Little tern Natterjack toad (Ramsar site only)	Impacts on functionally linked land including: Permanent and temporary loss of habitats (C, O, D) Temporary habitat fragmentation and species isolation (C, O, D) Impacts on protected species or on their resting or breeding sites (C, O, D) Disturbance of bird populations (C, O, D) Spread of non-native invasive species (C, O, D) In combination effects	Yes [REP1-066] However, NE advised that they could become a concern if impacts to the Humber Estuary SAC cannot be ruled out [REP5-053]

Table 2: Annex I habitats (Offshore, intertidal and terrestrial)

European site	Qualifying feature screened in	LSE pathway*	Does NE agree to no AEoI?
Dogger Bank SAC	Sandbanks which are slightly covered by sea water all the time	Physical change (to another seabed type) (C, O, D) Physical change (to another sediment type) (C, O, D)	n/a – Applicants concluded AEoI due to physical change (to another seabed and sediment type). NE agree.
		Abrasion/ disturbance of the substrate on the surface of the seabed (C, O, D) Habitat structure changes – removal of substratum (extraction) (C) Penetration and / or disturbance of the substratum below the surface of the seabed, including abrasion (C, D) Indirect effects (impacts on sandeel leading to impacts on the characteristic community and ecological function of Dogger Bank SAC)	**No** – see ID 3.2.7 to 3.2.11 of this RIES.
		Changes in suspended solids (water clarity) (C, O, D) Smothering and siltation rate changes (heavy) (C, O, D) Smothering and siltation rate changes (light) (C, O, D) Electromagnetic changes (O) Hydrocarbon & Polyaromatic Hydrocarbon (PAH) contamination (C, O, D) Introduction or spread of invasive non-indigenous species (INIS) (C, O, D) Synthetic compound contaminant (including pesticides, antifoulants, pharmaceuticals) (O)	? - NE's position is currently unclear **RIES Q59: To NE: The ExA understands the LSE pathways listed in this row are not of concern to NE. Can NE confirm if it agrees an AEoI can be excluded?**

European site	Qualifying feature screened in	LSE pathway*	Does NE agree to no AEoI?
		Transition elements & organometal (e.g. TBT) contamination (C, O, D)	
Flamborough Head SAC	Reefs	Smothering and siltation rate changes (heavy and light) (C, O, D)	Yes [REP5-053] [REP5-062]
	Submerged or partially submerged sea caves		
	Vegetated sea cliffs of the Atlantic and Baltic Coasts (screened in by the ExA on a precautionary basis, see Section 2.6 of the RIES)		
Humber Estuary SAC	Coastal lagoons	Smothering and siltation rate changes (heavy and light) (C, O, D)	Yes [REP5-053].
		Introduction of other substances (solid, liquid or gas) (C)	Yes [REP1-066] [REP4-129]
	Mudflats and sandflats not covered by seawater at low tide Sandbanks which are slightly covered by seawater all the time Estuaries Salicornia and other annuals colonising mud and sand Atlantic salt meadows (Glauco Puccinellietalia maritimae)	Smothering and siltation rate changes (heavy and light) (C, O, D)	**No** – see ID 3.4.1 of this RIES
		Introduction of other substances (solid, liquid or gas) (C)	Yes [REP1-066] [REP4-129]

Table 3: Annex II Migratory Fish (offshore, intertidal and onshore)

European site	Qualifying feature screened in	LSE pathway (C, O&M and D unless otherwise stated)	Does NE agree to no AEoI?
River Derwent SAC	River lamprey (present as a qualifying feature, but not a primary reason for site selection)	Underwater noise and vibration impacts due to UXO clearance (C)	Yes [REP3-057, HRA.1.7]
	Sea lamprey		
Humber Estuary SAC and Ramsar site	River lamprey	Underwater noise and vibration impacts due to UXO clearance (C) Indirect impacts through effects on preferred prey availability (screened in by the ExA on a precautionary basis, see Section 2.6 of the RIES) (C, O, D)	Yes [REP5-053]
	Sea lamprey		

Table 4: Annex II marine mammals (offshore)

European site	Qualifying feature screened in	LSE pathway	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
SNS SAC	Harbour porpoise	Physical or auditory injury resulting from underwater noise (C, O, D) Behavioural impacts resulting from underwater noise (C, O, D)	**No –** for project in-combination. See IDs 3.7.1 and 3.7.3 of this RIES	n/a
		Changes to prey availability (C, O, D) Indirect effects (spawning habitat loss for prey species during operation) (O)	**No** – see ID 3.7.4 of this RIES. The ExA has sought clarity on whether this applies to both the project alone and/ or in-combination.	
		Disturbance from vessels due to presence and underwater noise (C, O, D) Barrier effects from underwater noise (C, O, D) Vessel interaction (increase in risk of collision) (C, O, D) Disturbance to porpoise foraging at sea (C, O, D) Barrier effects due to the physical presence of offshore infrastructure (O)	? **RIES Q60: To NE: The ExA understands the LSE pathways listed in this row are not of concern to NE. Can NE confirm if it agrees AEoI can be excluded?**	

European site	Qualifying feature screened in	LSE pathway	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
Humber Estuary SAC and Ramsar site	Grey seal	Behavioural impacts resulting from underwater noise (C, O, D) Physical or auditory injury resulting from underwater noise (C, O, D) (in combination)	**No** - for Humber Estuary SAC in-combination; and for BNNC SAC alone and in-combination. See IDs 3.7.1 and 3.7.2 of this RIES.	n/a
BNNC SAC				? NatureScot has not participated in the examination to date
Humber Estuary SAC and Ramsar site	Grey seal	Disturbance from vessels due to presence and underwater noise (C, O, D) Barrier effects from underwater noise (C, O, D) Vessel interaction (increase in risk of collision) (C, O, D) Disturbance to seals foraging at sea (C, O, D) Barrier effects due to the physical presence of offshore infrastructure (O) Changes to prey availability (C, O, D)	? **RIES Q61: To NE: The ExA understands the LSE pathways listed in this row are not of concern to NE. Can NE confirm if it agrees AEoI can be excluded?**	n/a
BNNC SAC	Grey seal			? NatureScot has not participated in the examination to date
The Wash and North Norfolk Coast SAC	Harbour seal	Physical or auditory injury resulting from underwater noise (C, O, D)	Yes [REP3-057, HRA.1.7]	n/a

European site	Qualifying feature screened in	LSE pathway	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
		Behavioural impacts resulting from underwater noise (C, O, D) Disturbance from vessels due to presence and underwater noise (C, O, D) Barrier effects from underwater noise (C, O, D) Vessel interaction (increase in risk of collision) (C, O, D) Disturbance to seals foraging at sea (C, O, D) Barrier effects due to the physical presence of offshore infrastructure (O) Changes to prey availability (C, O, D)		
Moray Firth SAC	Bottlenose dolphin	Physical or auditory injury resulting from underwater noise (C, O, D) Behavioural impacts resulting from underwater noise (C, O, D) Barrier effects from underwater noise (C, O, D) Vessel interaction (increase in risk of collision) (C, O, D) Changes to prey availability (C, O, D)	n/a	? NatureScot has not participated in the examination to date

Table 5: Offshore ornithology

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
FFC SPA	Gannet, breeding	Disturbance/ displacement (C, O) Collision risk (O) Barrier effects (O) Indirect impacts through effects on habitats and/or prey species (C, O) In-combination effects	Yes [REP5-053]	n/a
	Kittiwake, breeding	Collision risk (O) Indirect impacts through effects on habitats and/ or prey species (C, O) In-combination effects	Applicants concluded AEoI for in-combination collision risk - NE agree [REP5-053]. However, NE also advise AEoI for collision risk from the project alone [REP5-053]. NE was also unable to rule out AEoI on ornithology receptors of FFC SPA from indirect impacts on prey species [REP5-056] [REP5-061, NE12]. The ExA has sought clarity on which features this applies to and whether this is for the project alone and/ or in-combination.	n/a

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	**NatureScot**
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) Indirect impacts through effects on habitats and/or prey species (C, O) In-combination effects	Applicants concluded AEoI for in-combination displacement - NE agree [REP5-053]. As above, NE was unable to rule out AEoI on ornithology receptors of FFC SPA from indirect impacts on prey species [REP5-056] [REP5-061, NE12].	n/a
	Razorbill, breeding		**No** NE advise AEoI as a result of in-combination disturbance and displacement [REP5-053]. As above, NE was unable to rule out AEoI on ornithology receptors of FFC SPA from indirect impacts on prey species [REP5-056] [REP5-061, NE12].	n/a
	Seabird assemblage, breeding		**No** NE advise AEoI as a result of in-combination disturbance and displacement [REP5-053] As above, NE was unable to rule out AEoI on ornithology receptors of FFC SPA from	n/a

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	**NatureScot**
			indirect impacts on prey species [REP5-056] [REP5-061, NE12].	
Greater Wash SPA	Red-throated diver, non-breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	Yes [REP5-053]	n/a
	Common scoter, non-breeding		Yes [REP3-057, OR.1.53] [REP5-053]	n/a
Coquet Island SPA	Puffin (assemblage feature)	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	Yes [REP3-057, HRA.1.7]	n/a
Farne Islands SPA	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	**No** NE advise AEoI as a result of in-combination disturbance and displacement [REP5-053]	n/a
	Atlantic puffin, breeding (assemblage feature)		Yes [REP5-053]	n/a
	Kittiwake, breeding (assemblage feature)	Collision risk (O) In-combination effects	Yes [REP5-053]	n/a
St Abbs Head to Fast	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	?

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
Castle SPA	Razorbill, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	NatureScot has not participated in the examination to date
	Guillemot, breeding		n/a	
Forth Islands SPA	Gannet, breeding	Disturbance/ displacement (C, O) Collision risk (O) Barrier effects (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	
	Guillemot, breeding (assemblage feature)	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding (assemblage feature)		n/a	
	Puffin, breeding		n/a	
			n/a	
Buchan Ness to Collieston Coast SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O)	n/a	

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
		In-combination effects		
Calf of Eday SPA**	Kittiwake (assemblage feature)	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot (assemblage feature)	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
Copinsay SPA**	Kittiwake, breeding (assemblage feature)	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding (assemblage feature)	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
East Caithness Cliffs SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	
Fair Isle SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	
	Puffin, breeding		n/a	

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
	Gannet, breeding	Collision risk (O) Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
Foula SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	
	Puffin, breeding		n/a	
Fowlsheugh SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	
Hermaness, Saxa Vord and Valla Field SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Gannet, breeding	Collision risk (O) Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Guillemot, breeding	Disturbance/ displacement (C, O)	n/a	

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
	Puffin, breeding	Barrier effects (O) In-combination effects	n/a	
Hoy SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Puffin, breeding		n/a	
Marwick Head SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
North Caithness Cliffs SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	
	Puffin, breeding		n/a	
Noss SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in
	Gannet, breeding	Collision risk (O) Disturbance/ displacement (C, O)	n/a	

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
		Barrier effects (O) In-combination effects		the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Puffin, breeding		n/a	
Rousay SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
Sumburgh Head SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
Troup, Pennan and Lion's Heads SPA**	Kittiwake, breeding	Collision risk (O) In-combination effects	n/a	? NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	
	Kittiwake, breeding	Collision risk (O)	n/a	?

European site	Qualifying feature screened in	LSE pathway*	Does relevant ANCB agree to no AEoI?	
			NE	NatureScot
West Westray SPA**		In-combination effects		NatureScot has not participated in the examination to date
	Guillemot, breeding	Disturbance/ displacement (C, O) Barrier effects (O) In-combination effects	n/a	
	Razorbill, breeding		n/a	

* In respect of decommissioning, the RIAA Part 4 [REP4-016, Table 9-10] stated that “It is anticipated that for the worst case scenario, the impacts will be no greater than those identified for the construction phase”. Decommissioning effects were not however explicitly assessed for each European site and qualifying feature.

** Note that the sites denoted with two asterisks above (**) were screened out in Table 4-10 of the HRA Screening Report [APP-049] however the RIAA Part 1 [REP5-007] confirmed that the sites had been subsequently screened in. Impacts on these sites during the non-breeding season were assessed in the RIAA Part 4 [REP4-016].