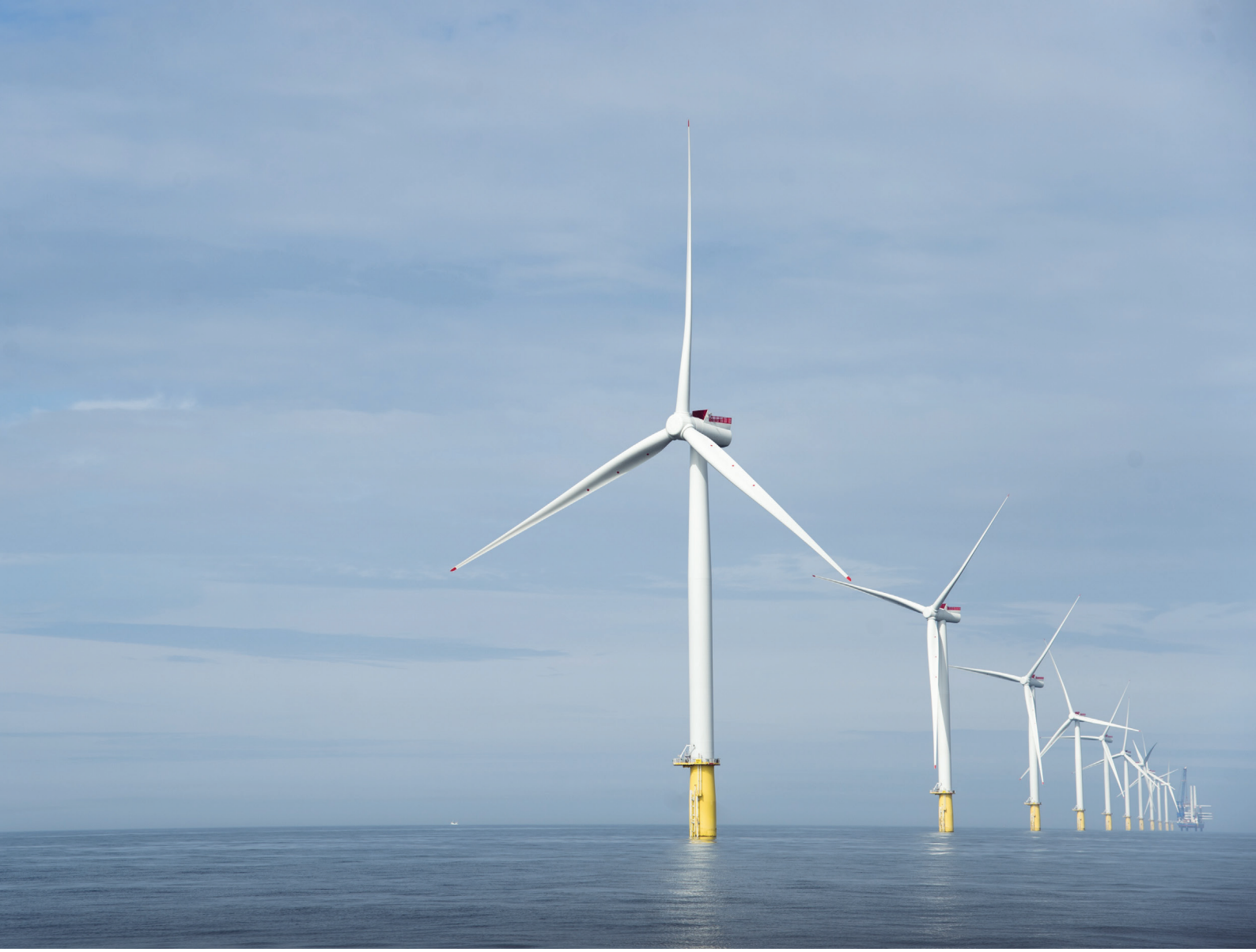

Sheringham Shoal and Dudgeon Offshore Wind Farm Extension Projects

The Applicant's Responses on Relevant Representations: Natural England Marine Mammals (Appendix D)

Revision A
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Glossary of Acronyms

AEOI	Potentially Significant
CEA	Cumulative Effect Assessment
CIA	Cumulative Impact Assessments
DBS	Dogger Bank South
DCO	Development Consent Order
DEP	Dudgeon Offshore Wind Farm Extension Project
DML	Deemed Marine Licences
EA1N	East Anglia ONE North
EIA	Environmental Impact Assessment
EPS	European Protected Species
ES	Environmental Statement
ETG	Expert Topic Group
GBS	Gravity Based Structure
HP4	Hornsea Project Four
IPMP	In Principle Monitoring Plan
JNCC	Joint Nature and Conservation Committee
LSE	Likely Significant Effects
ML	Marine Licence
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine management Organisation
MNR	Marine Noise Registry
MU	Management Unit
NE	Natural England
OD	Outer Dowsing
OSP	Offshore Substation Platforms
OWF	Offshore Wind Farm
PCoD	Population Consequences of Disturbance
PEMP	Project Environmental Management Plan
RIAA	Report to Inform Appropriate Assessment
SAC	Special Area of Conservation
SCOS	Special Committee on Seals

SEP	Sheringham Offshore Wind Farm Extension Project
SIP	Site Integrity Plan
SNCB	Statutory Nature Conservation Bodies
SNS	South North Sea
SoCG	Statement of Common Ground
TTS	Temporary Threshold Shift
UXO	Unexploded Ordnance
WCS	Worst Case Scenario
WNNC	Wash and North Norfolk Coast

Glossary of Terms

Dudgeon Offshore Wind Farm Extension Project (DEP)	The Dudgeon Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive. This includes candidate Special Areas of Conservation, Sites of Community Importance, Special Areas of Conservation and Special Protection Areas, and is defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017.
Evidence Plan Process (EPP)	A voluntary consultation process with specialist stakeholders to agree the approach, and information to support, the EIA and HRA for certain topics.
Expert Topic Group (ETG)	A forum for targeted engagement with regulators and interested stakeholders through the EPP.
Horizontal directional drilling (HDD) zones	The areas within the onshore cable route which would house HDD entry or exit points.
Interlink cable corridor	This is the area which will contain the interlink cables between offshore substation platform/s and the adjacent Offshore Temporary Works Area.
Offshore cable corridors	This is the area which will contain the offshore export cables or interlink cables, including the adjacent Offshore Temporary Works Area.
Offshore export cable corridor	This is the area which will contain the offshore export cables between offshore substation platform/s and landfall, including the adjacent Offshore Temporary Works Area.
Offshore export cables	The cables which would bring electricity from the offshore substation platform(s) to the landfall. 220 – 230kV.
Sheringham Shoal Offshore Wind Farm Extension Project (SEP)	The Sheringham Shoal Offshore Wind Farm Extension onshore and offshore sites including all onshore and offshore infrastructure.
The Applicant	Equinor New Energy Limited. As the owners of SEP and DEP, Scira Extension Limited and Dudgeon Extension Limited are the named undertakers that have the benefit of the DCO. References in this document to obligations on, or commitments by, 'the Applicant' are given on behalf of SEL and DEL as the undertakers of SEP and DEP.

1 Introduction

1. This document provides the Applicant’s responses to Appendix D Marine Mammals of Natural England’s Relevant Representation [RR-063].

1.1 Natural England Appendix D Marine Mammals [RR-063]

Table 1-1 Applicant's responses to Natural England's Relevant Representation Appendix D Marine Mammals

ID	Relevant Representation	Applicant Response
Appendix D Marine Mammals [RR-063]		
General Comments		
1	The construction of the windfarm will cause disturbance that will have significant effects on harbour porpoise and seals. Natural England disagrees with the Applicant's determination that established mitigation measures, namely the Marine Mammal Mitigation Protocol (MMMP) and the Site Integrity Plan (SIP), will reduce the risk of disturbance to all species and all designated site features. The reason for this is outlined below. • The MMMP and the mitigation measures therein are designed to reduce the risk of injury, not disturbance. One of the main mitigation measures to reduce injury, the use of Acoustic Deterrent Devices (ADD), is implemented to actively disturb animals away from the injury zone. Similarly, the soft start process for impact piling is designed to deter animals to distances beyond the injury zone before injurious noise levels are reached; and so also aims to actively displace marine mammals to notable distances. The Applicant should remove reference to MMMP as mitigation for disturbance.	To clarify, the Applicant did not intend to imply that the Marine Mammal Mitigation Protocol (MMMP) would be mitigation for disturbance effects. In the **Report to Inform Appropriate Assessment (RIAA)** [APP-059] the assessments of disturbance for seals use Temporary Threshold Shift (TTS) as a proxy. This assessment is considered together with the assessment of physical injury and auditory injury (Section 8.4.3.1.1 and Section 8.4.4.1.1) but is not separated and it is acknowledged that it could be clearer that the statement on mitigation is only intended to refer to injury. The Applicant therefore intends to re-present the information separately for injury and disturbance to clarify this point in a Marine Mammals Technical Note at Deadline 3. In addition, given the percentage of the grey seal potentially disturbed from the Humber Estuary Special Area of Conservation (SAC), this will also be given further consideration. The Applicant also intends to undertake Population Consequences of Disturbance (PCoD) modelling to further investigate potential effects. Section 10.6.1.5.3 in Environmental Statement (ES) **Chapter 10 Marine Mammal Ecology** [APP-096] states "*Any measures to reduce the potential significant disturbance of harbour porpoise would also reduce the potential for any significant disturbance, including barrier effects, in other marine mammal species*". This is not implying that 'established mitigation measures' would be used to reduce the risk of disturbance to all species and all designated site features, but that measures, such as those outlined in the **In Principle Site Integrity Plan (SIP) for the Southern North Sea (SNS) SAC** [APP-290], aimed to reduce the in-combination levels of underwater noise disturbance for harbour porpoise, could also reduce effects on other marine mammal species, including any barrier effects from Sheringham Offshore Wind Farm Extension Project (SEP) and/or Dudgeon Offshore Wind Farm Extension Project (DEP).

ID	Relevant Representation	Applicant Response
	• The specific purpose of the SIP is to ensure that in-combination levels of underwater noise disturbance do not exceed the Statutory Nature Conservation Body (SNCB)-advised thresholds for significant disturbance to the harbour porpoise feature of the Southern North Sea (SNS) Special Area of Conservation (SAC). In the SNS SAC, significant disturbance is assessed on both a daily and seasonal basis. One of the main methods proposed in the SIP, and used by offshore wind farms so far, is co-ordination of timings so that the daily thresholds are not exceeded. However, this does nothing to reduce the overall disturbance at the level of the reference population, for any marine mammal species, nor does it reduce the disturbance to harbour porpoise on a seasonal basis. It also does not reduce the disturbance to marine mammals from the project alone, which in some circumstances I.e. for seals is significant. Furthermore, the in-principle SIP assumes that there will be sufficient capacity for all possible activities to occur, an assumption which cannot be relied upon, especially if multiple offshore windfarms are being constructed in the SAC simultaneously. • The only measure in the SIP which may reduce disturbance is the use of noise abatement systems (NAS), as these reduce the noise level at source. As there is no guarantee that this specific measure will be implemented through the SIP process, we cannot consider that the SIP will reduce disturbance other than in the specific context for which SIPs were designed i.e., the in-combination underwater noise disturbance of the harbour porpoise feature of the SNS SAC. Furthermore, at the time of finalising the SIP there will be no consideration of other receptors (to seals for example) when determining what mitigation is needed. The lack of mitigation measures specifically targeting disturbance to marine mammals means there remains the potential for significant effects from disturbance to both seals and harbour porpoise at both EIA	Similarly, as noted in Section 10.7.1.1.1.3 in ES **Chapter 10 Marine Mammal Ecology** [APP-096], it is expected that the measures to reduce the potential disturbance of harbour porpoise from cumulative effects during offshore wind farm piling, through the implementation of the management measures within the SNS SAC SIPs, could also reduce the potential disturbance of other marine mammal species. The Applicant considers that this should have been phrased as 'could' rather than 'would' with the potential for benefit for species beyond harbour porpoise in the SNS SAC being dependent upon the mitigation implemented. It is acknowledged that currently, the primary measure outlined in SIPs, is the co-ordination of timings so that the Statutory Nature Conservation Bodies (SNCBs) daily and seasonal thresholds are not exceeded for harbour porpoise. However, Section 1.6 of the **In Principle SIP for the SNS SAC** [APP-290], outlines measures that will be considered during the development of the final SIP, including: • foundation types and installation methods within the consented project envelope, such as suction bucket and gravity base structure foundations. • noise mitigation systems are currently being developed and improved that enable a reduction of pile driving noise (decibels) at source. These methods currently include various types of bubble curtain, hydro-sound dampers, screens or tubes. • Other potential measures that could be available prior to construction. It is these bulleted measures which reduce or avoid noise impact which would benefit all receptors, but it is accepted that it is not a given that these would be implemented in the final SIP. The **In Principle SIP for the SNS SAC** [APP-290], follows current guidance and thresholds (Joint Nature and Conservation Committee (JNCC) *et al*., 2020). The aim of finalising the SIP prior to construction is to take into account any guidance and requirements at that time, as well as the final design of the Projects.

ID	Relevant Representation	Applicant Response
	and HRA level, the risk of which is currently underestimated within the various assessments and documentation provided. Natural England recommend further assessment is given to the risk and significance of disturbance to harbour porpoise and seal species and recommend that further mitigations measures which reduce disturbance and sound propagation I.e., sound abating measures, be retained as possible necessary options in the MMMP and SIP to reduce the effects of disturbance	Developing the final SIP prior to construction, rather than finalising now, allows the consideration and assessment of other relevant technologies or methodologies that may have emerged and have been proven to be effective by the time of offshore construction. **Confirmation of any measures that will be employed cannot be confirmed until project design parameters are finalised.** Final design of the Projects, including foundation type, will be done post-consent prior to construction. Current options for foundations are piled foundations for the wind turbines (monopiles or jackets with pin-piles) and Offshore Substation Platforms (OSP) (jackets with pin-piles), which are considered the worst-case for marine mammals as a result of underwater noise levels and disturbance. However, other options for the foundations are being considered, including screw piles, Gravity Based Structure (GBS) and suction buckets. If piled foundations for the wind turbines and / or OSPs are required, then the method of installation will be considered, such as impact piling, vibro piling or other methods which may reduce noise and could be available at the time of construction. Further assessment will be conducted prior to construction, based on the foundation type and installation method, to determine if there is the risk of significant disturbance to marine mammals. This will then be used to determine if further mitigation measures which reduce sound propagation and disturbance are required. If they are required, then a review will be conducted to determine what is the most appropriate and effective method based on the latest and available methods prior to construction. This will include a review of all suitable noise abatement measures at that time. This will be done in consultation with Natural England during the pre-construction phase together with consultation in developing the final MMMP and SIP prior to construction.
2	We advise that the vessel code of conduct is secured via a licence condition within the Deemed Marine Licence (DML). This could be part of a vessel management plan. The code of conduct should be a	Annex 1 of the **Draft MMMP** [APP-288] outlines Vessel Good Practice and Code of Conduct to Avoid Marine Mammal Collisions.

ID	Relevant Representation	Applicant Response
	standalone document, rather than an annex to the MMMP, and so it can be applied to all vessels. Such a code of conduct should be adhered to at all stages of the development e.g. not just the construction phase. The code of conduct should include the measure that established vessel routes between ports and the sites will be used, where possible, as this is an important assumption in the assessment of impacts from vessels. If it is not secured, then Natural England will not be able to consider the mitigation measures in the assessment. The vessel code of conduct must include measures to mitigate impacts to marine mammals e.g. minimum approach distances to seal haul outs, particularly during sensitive seasons (breeding and moulting). Natural England requests to be consulted on the code of conduct.	This has been incorporated into the **Outline Project Environmental Management Plan (PEMP) (Revision B)** [REP1-017]. This ensures that these measures are secured regardless of the foundation type required (i.e. since the MMMP is only required in the event that piles are taken forward as the foundation type). The Project Environmental Management Plan (PEMP) is required under Condition 13 of Schedule 10 and 11 (the Generation Deemed Marine Licences (DMLs)), Condition 12 of Schedules 12 and 13 (the Transmission DMLs) (**draft Development Consent Order (DCO) (Revision D)** [document reference 3.1]). The PEMP will be prepared following post-consent detailed design as required under the conditions of the DMLs included within the DCO: *"a project environmental management plan (in accordance with the outline project environmental management plan) covering the period of construction and operation".* Natural England will be consulted on the code of conduct in the final PEMP during the pre-construction phase.
Summary of Main Issues		
3	Position on Worst Case Scenario (WCS): Natural England largely agree, however there are refinements to the WCS regarding proximity of piles to the SNS SAC which need to be considered. More details are provided in detailed comments on the RIAA regarding section 8.4.1.1.1.2.2.1 [ID 92 of this table]	See response at ID 92 of this table.
4	Data suitability and baseline characterisation: Broadly yes. Natural England however has concerns over the characterisation of seal presence in the site and impact zones. Natural England recommend that post-consent monitoring is undertaken aimed at seal usage of sites, to validate ES assumptions. Natural England suggest improvements to how the seal abundance, density, and reference populations have been determined to make them	As outlined in Section 1.4.6.2 of the **Offshore In Principle Monitoring Plan (IPMP)** [APP-289], it is recognised that monitoring is an important element in the management and verification of the actual SEP and DEP impacts. Any requirements for post-consent monitoring, will be dependent on project design, construction method and the mitigation measures required. The final design and scope of monitoring will be agreed with the Natural England and included within the final Monitoring Plan submitted for approval. This will

ID	Relevant Representation	Applicant Response
	more accurate; but we are satisfied that the figures presented represent the worst case scenario.	include any requirements for post-consent monitoring aimed at seal usage of sites, to validate ES assumptions. The Applicant notes the Natural England comments on monitoring received here and in its Deadline 1 submissions [RR-063]. The Applicant is considering updates as appropriate to the **Offshore IPMP** [APP-289] and anticipates submitting an updated version of this at Deadline 3. Any further assessments prior to construction for the final design, if required, will be based on the latest information and guidance at that time. This will include any updates to seal abundance, density, and reference populations. However, as Natural England are "*satisfied that the figures presented represent the worst-case scenario*", no further updates to these are required for the Examination.
5	Environmental Impact Assessment (EIA) Methodology: Natural England do not agree with the sensitivity of harbour seal to changes in prey availability; this has been under-estimated. Natural England recommend that sensitivity should change along with improvements be made to the assessment on prey impacts in general be made in line with our detailed comments.	As outlined in Section 10.6.1.8.1 of ES **Chapter 10 Marine Mammal Ecology** [APP-096], harbour seal are considered to have low sensitivity to changes in prey resources, as they are opportunistic feeders, feeding on a wide range of prey species and they are able to forage in other areas and have relatively large foraging ranges. This was determined based on information provided in ES **Appendix 10.1 - Marine Mammal Consultation Responses, Information and Survey Data** [APP-191]. Low sensitivity is defined as 'individual receptor has some tolerance to avoid, adapt to, tolerate or recover from the anticipated impact', which is considered appropriate for the Environmental Impact Assessments (EIA). This approach has been used in other recent assessments for other offshore wind farm EIAs such as Hornsea 3, Awel y Mor, Kincardine OWF and Erebus FOWF. The Applicant also notes that ID 2.25 of the Marine Mammals Agreement Log (see the **Draft Statement of Common Ground (SoCG): Natural England (Offshore)** (document reference 14.7) that Natural England agreed with the approach for assessing the potential changes to marine mammal prey resources and that at ID 2.9 Natural England agree with the approach for determining marine mammal sensitivity.
6	There are some impact pathways where Natural England feel effects from the project-alone assessments could be significant but have been underestimated in the documentation. Natural England has outlined	Noted. Where required, the Applicant has indicated that matters will be addressed in a Marine Mammals Technical Note to be submitted at Deadline 3

ID	Relevant Representation	Applicant Response
	these recommendations in the detailed comments section. For example, the EIA methodology outlies proportions of a population which if impacted would trigger a significant effect. There are occasions in assessment e.g. with seal impacts where these levels are reached but the impact magnitude is considered minor the reasoning for which is difficult to understand.	
7	Cumulative Effect Assessment (CEA): The impact distances/parameters from other OWF projects considered in the CEA have been standardised to those considered applicable for SEP and DEP, which we do not agree with as variables namely water depth and project design can result in large differences in the way noise propagates. Natural England recommends the applicant should demonstrate that the approach is appropriate. The WCS has not always been assessed e.g., vessel numbers, prey disturbance. Natural England recommends the applicant update the assessment to include the WCS in the CEA. No rationale has been provided for screening out certain impacts. Natural England recommends that the Applicant provide rationale on screening out these pathways. Geophysical and seismic surveys has not been assessed as a mobile source. Natural England recommends that these surveys are assessed as a mobile source.	The Applicant will address the approach to the Cumulative Effect Assessment (CEA) and Worst Case Scenario (WCS) applied in a Marine Mammals Technical Note at Deadline 3. The screening of impacts for the CEA is outlined in Section 10.3.2 of ES **Appendix 10.3 Marine Mammal Cumulative Impact Assessment Screening** [APP-193]. The Applicant will investigate, and provide updated assessments as appropriate with respect the CEA of mobile sources in the Marine Mammals Technical Note at Deadline 3. Regarding potential impacts on prey see ID 53 and 114 of this table.
8	EIA conclusion: Our main concern, in addition to the points above, is that some potentially significant impact pathways that have not been appropriately mitigated. Natural England recommend that the assessment approach is reviewed and/or commit to further mitigation to reduce disturbance, and so ensure no significant effect.	As noted at ID 1 any measures to reduce the potential significant disturbance of harbour porpoise in the SNS SAC could also reduce the potential for any significant disturbance, including barrier effects, in other marine mammal species. Section 1.6 of the **In Principle SIP for the SNS SAC** [APP-290], outlines measures such as NAS that will be considered during the development of the final SIP. The Applicant does not consider that mitigation is required to be secured at this stage to reduce the number of individuals which may be

ID	Relevant Representation	Applicant Response
		disturbed. Further information will be provided in the Marine Mammals Technical Note at Deadline 3.
9	Habitats Regulations Assessment (HRA) screening: Natural England do not agree that physical and permanent auditory injury should have been screened out of the test of likely significant effects (LSE), as mitigation is relied on. Natural England recommends that the pathways; physical and permanent auditory injury should be assessed as having a LSE. We would not however expect a conclusion of AEoI due to the use of appropriate mitigation. We do not agree that impacts to supporting habitats of the Humber Estuary SAC can be screened out of having a LSE as there could be some material effect on the behaviour of seals associated with the site. Natural England recommends that the following pathway: impacts to grey seal habitats, should be assessed as having a LSE.	Physical and permanent auditory injury are not screened out from the assessment. These are covered as the first impact in the construction effects section for each site (e.g. 8.4.1.1.1.1.1 for the SNS SAC , section 8.4.3.1.1 for the Humber estuary SAC, etc). Due to the distance of Project to the supporting habitats of the Humber Estuary SAC (59km) any potential for likely significant effects (LSE) was screened out in **Appendix 1 Habitats Regulations Assessment Screening Report** [APP-060] and has not been considered further. Grey seal as a qualifying feature has been assessed for impacts outwith the SAC including disturbance, vessel interactions and supporting habitat considerations (such as changes in prey availability). Any clarifications or amendments to the existing assessment based upon Natural England comments from the Relevant Representation will be addressed in the Marine Mammals Technical Note at Deadline 3.
10	HRA methodology: We request to see more details in the assessment of barrier effects to seals (also see points on screening, on in- combination assessment, and broader concerns over characterisation of seal presence). Further detail should be provided in the assessment of barrier effects to seals, specifically regarding movement between important sites and feeding areas.	Noted. Where required, the Applicant has indicated that matters will be addressed in a Marine Mammals Technical Note to be submitted at Deadline 3
11	HRA assessment: There are some instances where clarification on the WCS is needed, for example simultaneous piling at DEP vs simultaneous piling across sites, in relation to impacts on the SNS SAC. Natural England recommends that clarity is required for the WCS for these scenarios. The number of piling days in the seasonal scenario is slightly lower than the WCS. It is advised to use the WCS of piling days in the seasonal scenario.	Regarding simultaneous piling see ID 43 of this table.

ID	Relevant Representation	Applicant Response
	Natural England request an assessment of disturbance to seals based on the WCS distances from the literature. It is advised to assess disturbance to seals using WCS impact ranges as these may have significant effects on protected sites as well as wider populations. Specifically, the number of grey seals potentially disturbed could have significant implications for the Humber SAC.	The Applicant will investigate and provide updated assessments as appropriate with respect the WCS distances from the literature for seals in the Marine Mammals Technical Note at Deadline 3.
12	The WCS of impacts to prey has not been assessed. It is advised to assess WCS of impacts to prey.	See the Applicant's response at ID 53 and 114 of this table.
13	HRA in-combination assessment: All appropriate plans and projects have been identified.	Noted.
14	However, in the cumulative assessment of impacts to the SNS SAC summer area (8.4.1.6.1 RIAA document) only 2 other windfarms are considered to have the potential to overlap temporally with DEP and SEP. It is not clear why Outer Dowsing is not considered as potentially overlapping and whether there is a risk that the other projects in the SAC may be delayed and thus overlap with SEP and DEP.	The Applicant notes this comment is incorrect. Four other windfarms are considered for the summer period. As noted in Section 8.4.1.6.1.1 (paragraph 488, 497 and Table 8-38) of the **RIAA** [APP-059], the offshore wind farms that could be piling at the same time as SEP and DEP, that also have the potential for disturbance within the SNS SAC for the summer area are: • Dogger Bank South (DBS) • East Anglia Hub (East Anglia ONE North (EA1N) as the worst-case potential overlap with the summer area) • Hornsea Project Four (HP4) • Outer Dowsing (OD)
15	We do not agree with the in-combination assessment method used for the Wash and North Norfolk Coast SAC. It is advised that the Applicant undertake an in-combination assessment against the WNNC SAC population specifically.	The in-combination assessment uses the SE England Management Unit (MU) population, which was considered the most appropriate given in-combination project locations and evidence from telemetry studies on harbour seal movements and potential foraging ranges. However, the assessment will be represented in terms of the Wash and North Norfolk Coast (WNNC) SAC population in the Marine Mammals Technical Note at Deadline 3. This revised assessment will also use the Carter et al. 2022 densities to ensure that most up to date information is used in terms of the likely number of individuals affected.

ID	Relevant Representation	Applicant Response
		Note that whilst this will likely increase the percentage of the population affected (as the WNNC SAC population is smaller than the SE England MU population), for the in-combination assessment, the worst-case effect presented is based on a number of assumptions that likely over-estimate the potential effects.
16	An incorrect approach to determining the seasonal average of disturbance has been taken. It is advised that the Applicant assess potential for disturbance over a season using the correct method.	See ID 105.
17	Mitigation measures have been inappropriately applied to reduce the significance of impact pathways. It is advised that the Applicant review the mitigation that is proposed and can be committed to at this stage.	See ID 1.
18	We have overall concerns about the SIP process in that it is highly uncertain as to what other projects might eventually look to operate at the same time. Whether in a high activity scenario there would be sufficient capacity to allow all activities to occur as planned without exceeding daily and seasonal thresholds of the SAC even with the use of coordination. There should be consideration and acceptance that further mitigation measures may be required to reduce noise and disturbance if a situation where more activities are occurring in the SAC that expected.	See ID 23 of this table.
19	HRA conclusion: Natural England has concerns over potentially significant (AEoI) impact pathways that have not been appropriately mitigated. It is advised to review the assessment approach and/or commit to further mitigation to reduce disturbance, and so ensure no significant effect.	Noted – see response at ID 1 of this table. The Applicant is intending to submit a Marine Mammals Technical Note at Deadline 3 to address a number of aspects related to assessment approach/methodology. Potential additional mitigation measures will be discussed if relevant.
20	Mitigation summary: The applicant has submitted a Draft MMMP. Approval of the final piling MMMP by the Regulators (in consultation with Natural England) and this	See response at ID 2 of this table. Natural England will be consulted on the code of conduct in the final PEMP during the pre-construction phase.

ID	Relevant Representation	Applicant Response
	has been secured in the DCO. The Outline MMMP itself had a suitable range of mitigation measures to address the risk of injury. Natural England advise that a standalone vessel code of conduct/management plan is secured as a consent condition, and contains appropriate measures for marine mammal mitigation.	
21	Natural England assume that the worst-case scenario used to underpin the marine mammal assessment e.g., no more than 2 monopiles or 4 pin piles across the two sites will need to be secured by condition within the DCO, along with maximum hammer energies. It will be important to have these limits on construction to ensure that the assessment remain valid. Can we have clarity over what exactly will be the maximum/worst case scenario in the consent?	The Applicant confirms that the worst-case scenario assumes no more than 2 monopiles or 4 pin piles across the two sites being installed within a 24 hour period.
22	The applicant has submitted an In-Principle SIP. Similarly, approval of the final SIP by the Regulators (in consultation with Natural England) has been secured in the DCO, however we have outlined some recommended timings for SIP production within our comments on the DCO (Appendix A Development Consent Order, Deemed Marine Licence, Project Description, In- Principle Monitoring Plan). Natural England do have some concerns regarding the SIP namely whether it's able to ensure the project is able to continue in a season where there is a high level of other activity and these have been outlined in the response. We advise that the Applicant consider committing to further Special Committee on Seals (SCOS).	See response at ID 23 of this table regarding Natural England's concerns with the SIP and its ability to ensure the Projects are able to continue in a season where there is a high level of other noise activity. As outlined by Natural England's at ID 1 of this table, the specific purpose of the SIP is to ensure that in-combination levels of underwater noise disturbance do not exceed the SNCB advised thresholds for significant disturbance to the harbour porpoise feature of the Southern SNS SAC. The Applicant assumes that the reference to Special Committee on Seals (SCOS) here is a typographic error.
23	In-Principle Site Integrity Plan: This is necessarily high level and has a suitable list of potential mitigation measures but we are too early in the examination process to provide detailed comment. We have suggested change to timelines of final SIP within our comments on the DCO. Broadly speaking Natural England has concerns over how the SIPs can be used to manage multiple projects to ensure that significant disturbance thresholds are not	The submission period for the SIP has been updated from no later than 4 months to no later than 6 months in the **Draft DCO (Revision D)** [document reference 3.1]. This change was also requested by the MMO. The Marine management Organisation (MMO) manage SIPs and activities from multiple projects to ensure that the significant disturbance thresholds for harbour porpoise in the SNS SAC are not exceeded. The MMO are planning to implement short and long term management measures, including (but not limited to), ensuring good coordination and liaison between operators; and

ID	Relevant Representation	Applicant Response
	exceeded; we therefore advise the Applicant to consider committing to mitigation at this time and not relying on the SIP.	update of JNCC Marine Noise Registry (MNR) so it can be used by all to better support coordination and scheduling of activities (MMO to ensure SNS SAC activity tracker is continuously updated to enable more proactive management of noisy activities against the SNS SAC noise thresholds until MNR updated). The Applicant notes Natural England's concerns, but highlights that the SIP is now the recognised framework by which in-combination effects will be managed. The SIP provides an adaptive management framework to allow the MMO to regulate underwater noise, with the exact mechanism determined at a point in time, i.e. prior to construction, where detailed design and scheduling information is available. Developing the final SIP prior to construction, rather than finalising now, allows the consideration and assessment of other relevant technologies or methodologies that may have emerged and proven to be effective by the time of offshore construction. This will allow assessments to be undertaken to determine whether the seasonal thresholds have potential to be breached, based on the extent and nature of activities that are actually occurring at that time. Based on these assessments it can be determined whether there is a requirement for further mitigation to be implemented, examples of which are included in the **In Principle SIP for the SNS SAC** [APP-290]. Confirmation of mitigation measures that will be employed cannot be confirmed until project design parameters are finalised. The **In Principle SIP for the SNS SAC** [APP-290] reflects the commitment of SEP and DEP to undertake required mitigation and management measures to reduce the potential for any significant disturbance of harbour porpoise in the SNS SAC, in relation to the conservation objectives and disturbance thresholds.
24	Draft Marine Mammal Mitigation Plan: As with the Outline SIP, it is necessarily high level, and has a suitable list of potential mitigation measures. The Applicant should clarify whether a low strike rate is proposed.	Confirmation of any measures that will be employed, such as low strike rate, cannot be confirmed until project design parameters are finalised. As outlined in the **draft MMMP** [APP-288], all suitable and effective mitigation will be considered prior to construction.
25	Offshore In-Principle Monitoring Plan:	The Applicant notes the Natural England comments on monitoring received here and in its Deadline 1 submissions [RR-063]. The Applicant is considering

ID	Relevant Representation	Applicant Response
	The marine mammal section lacks detail and is generally not fit for purpose. More detail is needed on the assumptions in the assessment, and how these could be tested through monitoring programmes, to confirm the outcomes of the assessments. We have made several suggestions throughout the response on topics for post-consent monitoring. The Applicant should identify potential strategic projects that could be contributed to.	updates as appropriate to the **Offshore IPMP** [APP-289] and anticipates submitting an updated version of this at Deadline 3.
Detailed Comments		
Environmental Statement Appendix 10.1 - Marine Mammal Consultation Responses, Information and Survey Data [APP-191]		
26	1. Section 10.1.3.3.1: Natural England advises that the Developer will need to consider the need for an EPS licence to injure (as well as disturb), should the full injury zones during noisy activities not be fully mitigatable.	Noted. As outlined in Section 10.1.3.3.1 of ES **Appendix 10.1 - Marine Mammal Consultation Responses, Information and Survey Data** [APP-191] and Section 10.4.1.5 of ES **Chapter 10 Marine Mammal Ecology** [APP-096], the marine wildlife licence application (including European Protected Species (EPS)) will be submitted post-consent. At that point in time, the project design envelope will have been further refined through detailed design and procurement activities and further detail will be available on the techniques selected for the construction of the windfarm, as well as the mitigation measures that will be in place following the development of the Marine MMMP for piling and Unexploded Ordnance (UXO) clearance.
27	2. Section 10.1.4.1 (and others): Natural England notes that bottlenose dolphin has been included in the ES, based on recent increase in sightings in the area. Connectivity to the Coastal East Scotland (CES) Management Unit (MU) has been included. A reasonable approach to assessing the density of bottlenose dolphin, by using the SCANS Block R values, has been used. We understand from the ES chapter that both the Greater North Sea(GNS) MU and CES MU have been used as reference populations. We welcome this approach.	Noted.
28	3. Section 10.1.4.2:	The Applicant screened in the Wadden Sea region following a request from Natural England at Expert Topic Group meeting 2.

ID	Relevant Representation	Applicant Response
	The Applicant has screened in the Wadden Sea region for both grey and harbour seals, which significantly increases the reference populations for these species. However, there is no corresponding inclusion of non-UK animals in the seal at-sea density maps used by the Applicant. There is therefore a mismatch in the scope of the populations in the assessment, which could lead to underestimating the magnitude of the impact. The Applicant should clarify how this has been taken into account in their assessment.	The Wadden Sea region was screened in as part of the reference population due to numerous tagging studies showing connectivity between the Project area and the wider North Sea (Unger *et al*., 2022; Brasseur *et al*., 2018; Russell, 2016 and Tougaard *et al*., 2003). The density used in the assessment is based on the recommended data source from Natural England (NE) (Carter *et al*., 2020 the most up to date information that was available at the time of writing) which only takes into account the UK distribution and density calculations for seals. This is the best available data. Whilst recognising the point made, there are no alternative datasets to use. The assessments for grey and harbour seal species have been undertaken based on the relevant MU for the Project, the south-east England MU, and put in context of the wider North Sea population.
29	4. Section 10.1.4.4.5: We have the following points to note on how the grey seal abundance estimate has been calculated. Firstly, there is inconsistency in the timing of counts used for each site. Most counts (presented in Table 10.5) are taken from SCOS. Reports which report the counts observed during the moult surveys undertaken in August (outside of any key period for grey seals where they would be expected to haul out in high numbers i.e., breeding or moulting). The count presented for Horsey Corner is based on a count during the breeding season and is therefore not comparable to the other counts. To note, the counts at Horsey Corner outwith the breeding season are much lower, greater than a factor of 10 (119 in 2019; SCOS, 2021). Furthermore, the counts used have since been superseded by the 2021 counts (SCOS, 2021). We acknowledge that this report was not available at the 'cut off' time for new sources for the ES. Nevertheless, Natural England has reviewed this report to ensure that any changes in numbers would not affect the assessment. Overall, the average August count of grey seals in the Southeast England MU in 2021 was 6,946, which is notably lower than the 8,667 figure used by the Applicant.	The seal counts were based on the information available at the time of writing. It is acknowledged that some of the counts were taken at different times of the year, however, it was important to include counts at relevant haul-out sites, even though from different times of year, this includes counts in the Wadden Sea and English MUs. The approach to the seal counts and numbers used for the MUs was based on a precautionary approach, to ensure the worst-case scenario was assessed, as noted by Natural England. As noted by Natural England, the SCOS (2021) report was not available at the time of writing and therefore information in ES **Chapter 10 Marine Mammal Ecology** [APP-096] and **Appendix 10.1 - Marine Mammal Consultation Responses, Information and Survey Data** [APP-191] was based on the most recent information at the time. The Applicant will review correction factors in relation to the Southeast England MU in the Marine Mammals Technical Note at Deadline 3.

ID	Relevant Representation	Applicant Response
	Similarly, the Northeast England MU for grey seal has reported a lower count in 2020 of 4,660 (SCOS, 2021), compared to the 6,501 count from 2019. These points notwithstanding, we consider that the SMU estimate by the Applicant is likely to be a significant under-estimation because they do not take into account any correction factor to correlate the number of animals counted to the total population count across the SMU. The August count data is typically only ~23% of the population size (Russell *et al*., 2015). To illustrate, SCOS (2021) show that the grey seal population in the southeast England SMU alone is in excess of 40,000. Therefore, although we do not consider it an accurate estimate of the population size, it is likely over- precautionary and therefore can be considered the worst-case scenario. We also note that there is a mismatch between the timings of counts in the Wadden Sea and English MUs. Therefore, the feasibility to produce an accurate MU population, should been considered when determining which MU(s) to use in future i.e. can the Wadden Sea be appropriately considered or should it not be included. Natural England advise that steps should be taken in the future to produce more precise estimates for the reference population.	
30	5. Section 10.1.4.4.5: The Applicant notes that the correction factor used represents the time that grey seals spend at the surface. The Applicant should clarify how they took into account time seals spent below the surface but are still detectable to aerial surveys. This is also applicable to harbour seals (Section 10.1.4.4.6).	As detailed in Section 10.1.4.4.5 paragraphs 126-128 for grey seal and paragraphs 168-170 for harbour seal of ES **Appendix 10.1 - Marine Mammal Consultation Responses, Information and Survey Data** [APP-191]: Correction factors were applied to the relative density estimates to account for the presence of individuals below 2m water depth (the depth at which it is no longer possible to detect marine mammals from aerial imagery). For grey and harbour seal, the Sea Mammal Research Unit (SMRU) used tagging studies of 44 grey seals (1997) and 17 harbour seals (2003-2004) in the Pentland Firth and Orkney (SMRU, 2011). For grey seal, data collected from 22,012 dives found an average of 27.09% time spent at the waters surface. This did not account for the time that the seals would be just below

ID	Relevant Representation	Applicant Response
		the water's surface and so would still be detectable in aerial surveys. Therefore, the correction factor for grey seal is 0.27. This seasonal correction factor (of 0.27) has been used to generate grey seal relative density and abundance estimates for the SEP and DEP sites and 4km buffer. For harbour seal, data collected from 44,156 dives found an average of 18.32% if time spent at the water's surface. This did not account for the time that the seals would be just below the water's surface and so would still be detectable in aerial surveys. Therefore, the correction factor for harbour seal is 0.18. This seasonal correction factor (of 0.18) has been used to generate harbour seal relative density and abundance estimates for the SEP and DEP sites and 4km buffer.
31	6. Section 10.1.4.4.5: We welcome the use of the updated seal at-sea maps from Carter *et al*. (2020) to determine seal density in the project area.	Noted.
32	7. Section 10.1.4.4.6: To note, our points on the accuracy of the grey seal reference population estimate due to it being based on un-corrected counts, are broadly applicable to the harbour seal reference population estimate also. We have also reviewed the more up-to-date SCOS report (SCOS 2021) and find the counts of harbour seals to be broadly similar. Though we note decreases in harbour seal counts on the smaller sites of Blakeney (2021 average of 181 compared to 329 presented) and Scroby Sands (2021 average of 25, compared to 193).	Noted. As outlined above, the seal counts were based on most recent information available, at the time of writing.
33	8. Section 10.1.4.4.6 (and 10.1.4.4.5): It is Natural England's view that digital aerial surveys are not a suitable method for characterising the presence of seal species in project sites, due to difficulty in species identification when using this method. When it is not possible to determine the species of a number of sightings, it is precautionary to include unidentified seals in the estimates of density	Noted. Two years for baseline data are currently required for offshore wind farms and digital aerial surveys are the most appropriate method to survey large offshore wind farm areas for marine mammal species. The approach to site specific surveys was agreed with NE at ETG 1 (see the Agreement Log in the **Draft SoCG: Natural England (Offshore)** [document reference 14.7])

ID	Relevant Representation	Applicant Response
	and abundance of both species. However, if the number of 'seal species' is particularly high, then it risks inflating these estimates beyond what is likely to be accurate for either species due to double-counting. It would also obscure any species-specific trends in the estimates for the site. This issue is present in the ES. The number of unidentified seal sightings have resulted in high abundance estimates of both harbour and grey seal in the site. To illustrate, the maximum abundance estimate for grey seal (1,700) is ~20% of the reference population; and the maximum abundance estimate for harbour seal (2,342) is ~62% of the reference population. Whilst we do not consider that either of these abundance estimates are accurate, the Applicant has not attempted to improve the accuracy of these abundance estimates. We would welcome suggestions from the Applicant on ways to get a more accurate abundance estimate of seals in the sites. The abundance estimate is of particularly concern for harbour seal. If the site did indeed support up to 62% of the population at any one time, then the site would be of significant importance to the harbour seal MU population. This would increase the significance of any effects identified, necessitating greater scrutiny of whether the effects may hinder the restoration of this population. Due to the aforementioned issues, we have low confidence that the results of the Digital Aerial Surveys reflect the true presence of seals in the site. The Applicant has used other sources to support their assessment of abundance and density estimates in the site. Particularly, they use Carter et al. (2020), which does provide species-specific information on at- sea usage by grey and harbour seals. However, these data are not without issue. The telemetry data of seals which Carter et al. (2020) used to determine at-sea abundance is not that recent for The Wash (grey seal tag data from 2005, 2008 and 2015; harbour seal tag data from 2012 and 2016). Given the age of the tag data, it will not reflect any potential changes as a result of the recent harbour seal decline (2018-19).	The issues of identifying and getting realistic seal counts for offshore wind farm areas are acknowledged and understood, which is why density estimates and abundance counts for seals were not based on the site-specific data from the aerial surveys. The information on seals from the site-specific data from the aerial surveys were therefore presented in ES **Appendix 10.1 - Marine Mammal Consultation Responses, Information and Survey Data** [APP-191] with a summary in ES **Chapter 10 Marine Mammal Ecology** [APP-096] for information, but were not used in the assessments in the ES. As the density estimates and abundance estimates from site-specific surveys were not used in the assessments and were included for information only, there was no requirement to improve these estimates and therefore the data were only presented. The Applicant notes that NE have low confidence that the results of the digital aerial surveys reflect the true presence of seals in the site, however, **as the aerial survey data was not used in the assessments, there are no implications for the outcome of the assessments**. As noted by Natural England, data sources other than the aerial surveys were used to determine the abundance and density estimates for seals used in the assessments. This was based on Carter *et al*. (2020) and SCOS (2020) MU counts, the most recent information available at the time of writing the ES. Confirmation of the recent decline in harbour seal counts in The Wash (SCOS, 2021) was not available at the time of writing the ES and RIAA. The Applicant notes that Natural England have low confidence in the assessment conclusions due to the uncertainties in densities. The Applicant reiterates that the information used is the best available. The Applicant is submitting a Marine Mammals Technical Note at Deadline 3 and will include a review of the Carter et al 2022 and any other more recent data sets to understand if this significantly affects the densities presented in the ES. As outlined above, any further assessments, if required, prior to construction will be based on the latest information available at that time, including the latest seal counts in the SCOS reports and MU counts.

ID	Relevant Representation	Applicant Response
	As a result of these uncertainties, we do not have a high confidence in the estimation of density of seals in the project zones, and therefore the number of seals which may be impacted. This has a knock-on effect in our confidence on the assessment conclusions in the ES. This is of particular concern for the designated harbour seal feature of the Wash and North Norfolk Coast SAC, which are due to be set to restore. We therefore strongly advise that the Applicant undertake post-consent monitoring aimed towards better understanding of seal usage of the site.	It is acknowledged that Natural England are preparing to update The WNNC SAC Conservation Objectives for harbour seal to the restore conservation objective in March 2023 (Appendix D1 of the Relevant Representations of Natural England [RR-063]). As previously outlined, the most recent information was used at the time of writing the ES and RIAA. Any further assessments, if required, prior to construction will be based on the latest information available at that time, including any updates to WNNC SAC Conservation Objectives for harbour porpoise. Although it is important to note, any impacts from the Projects are not anticipated to result in any 'loss' of harbour seals, with effective and appropriate implementation of mitigation in the MMMP for injury (including auditory injury) during piling (or UXO clearance) and vessel code of conduct in the PEMP for collision risk. As outlined in ID 4 of this table, any requirements for post-consent monitoring, will be dependent on project design, construction method and the mitigation measures required. The Applicant notes the Natural England comments on monitoring received here and in its Deadline 1 submissions [REP1-136]. The Applicant is considering updates as appropriate to the **Offshore In Principle Monitoring Plan (IPMP)** [APP-289] and anticipates submitting an updated version of this at Deadline 3.
Environmental Statement Appendix 10.2 - Underwater Noise Modelling Report [APP-192]		
34	9. Section 4.3.1: Natural England welcomes the inclusion of modelling of simultaneous and sequential piling, as these are within the project design envelope.	Noted.
35	10. Section 5.3: We acknowledge the rationale behind the applicant not presenting a range of impact for simultaneous piling. However, as ADD duration is often linked to the worst-case impact range, we query how an appropriate ADD duration can be calculated for simultaneous piling. This point should be discussed post-consent in the context of the MMMP and the draft MMMP should be updated to reflect this commitment.	Noted. Further assessment will be conducted prior to construction, based on the foundation type and installation method, to determine if there is the risk of significant disturbance to marine mammals. This will then be used to determine if further mitigation measures which reduce sound propagation and disturbance are required. If they are required, appropriate ADD duration can be calculated based on the most likely installation scenarios are confirmed.

ID	Relevant Representation	Applicant Response
		This will be done in consultation with Natural England during the pre-construction phase together with consultation in developing the final MMMP and SIP prior to construction.
36	11. Section 6.1: We note that the Applicant has modelled the continuous sources over a 24 hour period, which we welcome.	Noted.
37	12. Section 6.2: We note that the Applicant has used a novel approach to determining the operational WTG noise at range. We defer to Cefas, the MMO's technical advisers, for comment on this approach. However, we do note that this method provides a slightly higher source level than previous extrapolation methods, so the overall level of precaution appears higher with this new method.	Noted. Cefas, did not have any comments on the approach to determining the operational WTG noise at range in the MMO Relevant Representations [RR-053].
38	13. Section 6.3: Our understanding is that the weight of donor charge for large UXOs is notably higher than the 0.5 kg modelled; typically, it is a minimum of 5kg, and we have seen up to 25 kg being used too. The Applicant should provide evidence on the appropriate weight of donor charges and ensure that the underwater noise modelling reflects this. Natural England notes that this relates to the UXO assessment, which is only illustrative at this stage, this could be done post-consent.	As noted by Natural England and outlined in ES **Appendix 10.4 – Marine Mammal Unexploded Ordnance (UXO) Assessment** [APP-194], the assessment is provided with the DCO application for information purposes only. A separate Marine Licence (ML) application for UXO clearance will be submitted post-consent once detailed information on the locations and extent of UXO required to be cleared is known. Further assessment will be carried out based on the size of UXO and donor charge required, to determine mitigation required. This will be done post-consent. Natural England will be consulted on the final MMMP for UXO clearance and the assessments on which the mitigation requirements are assessed.
39	14. Section 6.3.3.1: Should a bubble curtain be used for UXO clearance, we advise that underwater noise monitoring should be undertaken, to demonstrate their effectiveness of reducing noise propagation and validate the assumption of a 10dB reduction.	Noted. However, the first and preferred option for any UXO clearance, where applicable, would be low-order clearance.
Environmental Statement Chapter 10 Marine Mammal Ecology [APP-096]		

ID	Relevant Representation	Applicant Response
40	15. Section 10.4.1: It is important that the need for an EPS/Marine Wildlife Licence is considered sufficiently in advance. This will ensure that, should additional mitigation measures be needed to reduce the likelihood of an offence, and satisfy the alternatives test, they can be implemented adequately and be taken into account in financial decisions. Natural England anticipates being consulted on any EPS licence application, should it be required.	Noted. Natural England will be consulted on any Marine Wildlife licence application, should it be required.
41	Natural England welcomes that the Applicant has defined their tiers for the CIA based on JNCC and Natural England guidance.	Noted.
42	There is significant uncertainty around Temporary Threshold Shift (TTS) and the levels at which is becomes ecologically significant for an animal. We do not disagree with the Applicant's assessment of medium sensitivity to TTS but equally we do not consider there to be sufficient evidence to confidently conclude the sensitivity of marine mammals to TTS. We also note the limitations in the assumption that 100% of animals that experience TTS will flee. The Applicant considers this very precautionary, however Natural England consider that there is also a risk of disturbance/fleeing at lower noise levels than the TTS threshold, therefore this in effect 'balances out' some of the precaution. Disturbance at greater distances than the TTS range may still impact an individual's natural/key behaviour e.g. foraging, reproduction, which could have lasting effects if it happens repeatedly.	Noted. Where required to further assess disturbance from underwater noise, the Applicant has indicated that matters will be addressed in a Marine Mammals Technical Note to be submitted at Deadline 3.
43	In the list of simultaneous piling scenarios, the scenario of simultaneous piling at one of the sites i.e., DEP or SEP is not listed. However, Table 10-1 lists "potential for simultaneous piling" at DEP and at SEP. We therefore require clarity whether simultaneous piling at one site is indeed within the PDE. If so, the Applicant should provide information to demonstrate that simultaneous piling at one site is not in fact the worst-case scenario when assessing the number of animals within the impact zone. This is particularly relevant to species which were detected in higher densities at one site only. For example, for the assessment of	The Applicant clarifies that simultaneous piling in either SEP or DEP is a potential option. The Applicant notes that simultaneous piling at SEP and DEP i.e. one piling operation in SEP at the same time as a piling operation in DEP results in the greatest underwater noise impact ranges and therefore is considered to be the worst-case scenario for underwater noise impacts with respect to EIA. Regarding the influence of simultaneous piling on the **RIAA** [APP-059] see ID 96.

ID	Relevant Representation	Applicant Response
	underwater noise impacts on harbour porpoise based on simultaneous piling, we query whether simultaneous piling at DEP would be worst due to the higher densities at this site.	
44	We note that the Applicant has not calculated that number of animals that may be impacted after the implementation of mitigation. We acknowledge that it would be very difficult to estimate numbers (?). There are many assumptions about the effectiveness of the mitigation measures proposed e.g. effectiveness of ADD at displacing beyond Permanent Threshold Shift (PTS)/TTS distances; the nature of the fleeing response (straight line, onset at distance); behavioural disturbance ranges; displacement around vessels prior to pile driving. Validation of these assumptions around the mitigation measures should be considered for post-consent monitoring, to demonstrate that the assessment conclusions are valid. This and other assumptions made in the assessments should be listed in the In Principle Monitoring Plan.	The Applicant notes the Natural England comments on monitoring received here and in its Deadline 1 submissions [REP1-136]. The Applicant is considering updates as appropriate to the **Offshore In Principle Monitoring Plan (IPMP)** [APP-289] and anticipates submitting an updated version of this at Deadline 3.
45	There are some minor errors in Table 10-40 – we infer that the magnitude the corresponds to 0.008% of the harbour porpoise NS MU being affected is Low, rather than the Medium stated. Similarly, the 0.006% of the grey seal SE MU population corresponds to a magnitude of Low, rather than Medium. The % of the wider ref pop should be ~0.002% (still a Low magnitude). The % of the harbour seal populations are incorrect. 0.3 individuals should correspond to ~0.008% of the SE MU (which is low, rather than negligible) and ~0.0009% of the wider ref pop (negligible magnitude, rather than low).	Noted. The Applicant acknowledges these minor errors and does not consider that following their correction, any change to assessment conclusions would result and therefore does not intend to provide an update during Examination.
46	We note that the assessment of ADD disturbance is indicative only. However, we do not consider that the 10 or 20 minute ADD activation period is appropriate given the Applicant's commitment in the MMMP to base the duration of the ADD activation time on the maximum PTS range (as the PTS range based on SELcum would require notably longer ADD activation periods). We advise that an updated assessment of the disturbance impact from ADDs will be needed when the ADD activation time is finalised. We therefore do not believe it is appropriate to make a conclusion on impact significance of ADD disturbance at this	Noted. See response at ID 35.

ID	Relevant Representation	Applicant Response
	time and cannot agree the conclusions presented in Table 10-51 (and Table 10-57).	
47	10.6.1.2: In this section the impact being assessed is “Disturbance from Underwater Noise Associated with Piling Activities”. Whilst the assessment of disturbance from ADDs covers all marine mammal species, the following sections (10.6.1.2.2-4; and 10.6.1.2.2.5 to an extent) only provide information on harbour porpoise. We infer that there is limited equivalent information on disturbance in other species (e.g. no disturbance threshold; no dose-response curves; no monitoring of return times; no equivalent to DEPONS). We assume that the assessment of TTS in the previous section/Table 10-46 is being used to inform the impact significance of disturbance from piling itself for other marine mammal species. We note that these assessments are all minor adverse before mitigation. However, as detailed in general comment 1 [ID 1], the MMMP aims to reduce injury but will not reduce disturbance. This is a key difference between assessing TTS as an injury, or as a disturbance. The Applicant should consider committing to mitigation measures that are directly aimed at reducing disturbance in species, and/or monitoring disturbance in marine mammal species.	Noted, See response at ID 1. Where required to further assess disturbance from underwater noise, the Applicant has indicated that matters will be addressed in a Marine Mammals Technical Note to be submitted at Deadline 3.
48	To note, the harbour seal population in the East of England is no longer increasing and has undergone a recent decline. Therefore, the conclusion that the high intensities of vessels in this area is not affecting the seals may not hold true. Should an investigation into the link between offshore wind farm development and the harbour seal decline occur (see other comments), presence of vessels could be one of the factors investigated.	Noted. See response at ID 29.
49	10.6.1.5: We do not agree with the Applicant’s interpretation of seal usage and foraging routes at the sites. As shown in the usage maps from Russell et al. (2017), which more closely reflects telemetry tracks and so known migratory routes, there are areas of higher seal usage that overlap or are adjacent to (but further from the coast from) the SEP and DEP sites. This is relevant for both harbour seals (Figure 10.1.4 in	Noted. While the Applicant acknowledges the use of the site may have been understated, the potential sensitivity of barrier effects from noise has been considered as Medium for seals and due to the nature of the impact there is unlikely to be any significant long-term impacts from any barrier effects, as any areas affected would be relatively small in comparison to their range.

ID	Relevant Representation	Applicant Response
	ES Appendix 10.1) and grey seals (Figure 10.1.1 in ES Appendix 10.1). Telemetry data for seals from the SE MU should be presented. Whilst there is suitable habitat available in the wider area to seals (Carter et al., 2022), the usage of the site should not be underestimated.	
50	Subsequent to our comment over the accuracy of the baseline characterisation of seals, we have low confidence in the outcomes of this assessment. We therefore advise that seal usage of the SEP and DEP sites before, during and after construction should be considered for post-consent monitoring.	See response at ID 4 of this table.
51	10.6.1.7: Natural England consider that the moult season for harbour seals, which occurs in August, is also a sensitive period and any mitigation measures pertaining to the sensitive period should be undertaken at this time too.	Noted.
52	10.6.1.8.2: We do not agree that harbour seal sensitivity to changes in prey is low. Wilson and Hammond (2019) drew the tentative conclusion that declines in harbour seals in northern regions of Scotland was linked to diet (particularly declines in sandeels). At the time of this publication the southeast England population of harbour seals was not declining, but a decline has since been observed. It is therefore possible that this decline is linked to prey, which could reflect a heightened sensitivity to changes in prey. We therefore advise that harbour seal sensitivity to changes in prey should be medium. Wilson, L. J., & Hammond, P. S. (2019). The diet of harbour and grey seals around Britain: Examining the role of prey as a potential cause of harbour seal declines. Aquatic Conservation: Marine and Freshwater Ecosystems, 29, 71-85.	See response at ID 5 of this table.
53	10.6.1.8.2.4: The Applicant has based their assessment of impacts to prey on fish with a swim bladder involved in hearing and a fleeing response. This is a combination of the most sensitive receptor group, but a less conservative assumption of fleeing. Sandeel, an important prey species for marine mammals and are unlikely to be as sensitive to noise impacts, however it is not clear whether a fleeing response would be appropriate for this species group. It would be beneficial for the	The response of each prey species to underwater noise will differ and these different responses are covered in detail in **Chapter 9 Fish and Shellfish Ecology** [APP-096] (see section 9.6.1.4). The assessment presented for the marine mammals takes as its starting point the worst case for disturbance impact upon fish, which assumes that prey species are sensitive and will flee.

ID	Relevant Representation	Applicant Response
	Applicant to undertake a brief assessment of impacts to sandeel specifically, using appropriate assumptions about auditory and behavioural response.	This was done on a precautionary basis and to allow brevity in the marine mammals assessment. The effects on sandeel are discussed in the in **Chapter 9 Fish and Shellfish Ecology** [APP-096] (see section 9.6.1.4). Sandeel are considered as part of the group '*Fish with no swim bladder or other gas chamber'* and due to their burrowing behaviour and substrate dependence, assumed to have limited capacity to flee the area compared to other fish species in this group. Sandeel are thus considered to have a higher sensitivity then other members of this group (medium) but overall given the magnitude of effect is localised and temporary and small in relation to the overall area of available sandeel habitat no significant effects were predicted upon the species. Also see ID 114.
54	10.6.1.8.2.4: In relation to the figures presented in Paragraph 558 – the Applicant should present the area of prey response (and inferred temporary loss) as a proportion of the total foraging area. We anticipate this proportion to be low for cetaceans, however for seals, with smaller foraging ranges, it may be of greater significance. We note that the impact ranges from Hawkins et al. (2014) are greater than the impact predicted to both seals and their prey using the TTS thresholds, and so comprises the worst-case scenario for prey loss. It is important to note that temporary loss of feeding opportunities within these impact ranges will likely result in the affected individuals feeding elsewhere, increasing competition. This increase in competition may be both intra- and inter-specific in seals, for which the area of loss around SEP&DEP is within the foraging range of large colonies of both species. The assessment for SEP&DEP alone (Table 10-80) indicates that approximately 1,100 seals would be temporarily affected (displaced) by the loss of prey in the impact areas. This impact would occur for up to 3 months at DEP, and then 3 months at SEP (see point below re 3 months). These added considerations should be factored into a revised assessment of impact magnitude. Table 10-80 – the Applicant has not presented any information on potential recovery rates of fish within these behavioural response impact	It should be noted that in the absence of reliable numerical criteria for behavioural disturbance in fish, observed levels from Hawkins et al. (2014) have been used, even though the authors of the paper themselves do not recommend use of the values as criteria for EIA. It is noted that the study was conducted under conditions in quiet inland waters which are unlikely to be equivalent to those around the SEP and DEP offshore sites and therefore even though the assessment does not account for potential recovery rates (which are unknown) the assessment is considered to be suitably precautionary. The assessment is illustrative of an area of effect (based upon potential behavioural response impact ranges and areas for prey species) and therefore numbers of marine mammals that could be affected by temporary changes in prey resource. However, the assessment is not stating that underwater noise sterilises the areas of prey, does not indicate any mortality of prey and does not take into account that the mammals will be disturbed from the area themselves. As discussed in ID 53 the assessment is based on the worst case effects on prey and does not take into account the fact that many species (such as sandeel) will not be affected. The duration of piling is again illustrative of how long any effect will persist for and is not the basis of a quantified assessment

ID	Relevant Representation	Applicant Response
	ranges. Given this, we consider that recovery should not be assumed to be instant, and so the assumption that the impact will only occur for the duration of active piling is not suitably precautionary. We consider that the 3 month piling window at each site would be more appropriate. Based on this comment, and the comment 2 above, we do not agree with the assessment of negligible magnitude. These added considerations should be factored into a revised assessment of impact magnitude. This is of concern because of some of the species, the combination of high magnitude and low sensitivity would otherwise be considered moderate adverse, a significant impact in EIA terms. This and our advice that harbour seal sensitivity should be medium.	Given the illustrative nature of the assessment and lack of any reliable quantitative methods to determine the magnitude of effect upon marine mammals, the Applicant does not consider that there is a requirement to update the assessment.
55	10.6.1.8.3: In line with General comment 1 [ID1], we do not consider that the measures in the MMMP will reduce impacts to changes in prey, nor the SIP (unless noise abatement is implemented). Particularly with regards to the MMMP, the mitigation measures are only effective for animals which will flee directly away from the noise source; there is limited evidence of such fleeing capability in fish. Whilst mitigation is not currently relied on to conclude no significant residual impact, this may need reviewing following a revision of the assessment in line with our comments above.	See response at ID 1, 53 and 54 of this table.
56	10.6.1.8.5: The assessment for SEP and DEP has been based on TTS alone. The approach taken for SEP or DEP, using the Hawkins et al. (2014) impact areas, should also be undertaken for SEP and DEP.	Noted. See response at ID 54 of this table.
57	10.6.2.1.1: The tagging data from Russell et al. (2014) is from 2011-2012, and therefore is 10 years old. It would be interesting to understand if the observation that grey and harbour seals forage within operation wind farms has changed in the southern North Sea. This could be tied into an overall post-consent monitoring programme targeted at seals specifically.	Noted. See response at ID 4 of this table.
58	10.6.2.7.2.4: The effects of offshore wind farms as fish aggregating devices on marine mammals is poorly understood. The effects may not	

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	be beneficial to all marine mammals, and indeed may have a knock-on negative effect to those marine mammals that cannot exploit the offshore wind area as well, by potentially reducing prey availability outside of the wind farm. Due to lack of evidence, we do not necessarily agree that the magnitude of the effect is negligible. We acknowledge that the evidence on potential changes to prey communities is limited and is being looked at through some strategic-level projects. Given our concerns about impacts to the unfavourable harbour seals in particular, and how this could be linked to prey, the Applicant should consider this for their post-consent monitoring.	
59	Section 10.7: The CIA scenario of vessels during construction is stated to be based on 16 vessels. However, the construction of SEP&DEP concurrently would result in 25 vessels being present (see Section 10.6.1.4.6). This is the worst-case scenario that should be used in the CIA.	Noted. This error will be addressed within a Marine Mammals Technical Note to be submitted at Deadline 3.
60	10.7 (also 10.7.1.1.1.4): The approach taken by the Applicant in the CIA is to standardise impact distances to those calculated for SEP and DEP specifically; the distances used are not industry-standard and may not be directly applicable to other projects. To illustrate, projects in deeper water may have larger predicted impact ranges – this is seen in the underwater noise modelling for Hornsea 4, for which the TTS zone from a monopile is 2200 km^2 for minke whale (2x that assessed by the Applicant) and 670 km^2 for seals (3x that assessed by the Applicant). Further information is required to demonstrate that the approach of standardising to SEP and DEP is appropriate.	Noted, the Applicant will provide additional information on the approach or updates to the Cumulative Impact Assessments (CIA) as relevant within the Marine Mammals Technical Note to be submitted at Deadline 3.
61	10.7.1: We would welcome the Applicant undertaking an assessment using DEPONS or iPCOD to support their CIA. The Applicant has based on the CIA on what they determine to be a “most realistic worst-case scenario”, and not a “highly unrealistic” worst-case scenario. It therefore follows that any significant effects are not the result of the assessment being highly unrealistic. This places further importance on using other tools such as DEPONS or iPCOD to determine impacts to populations, where significant effects have been identified.	The Applicant intends to undertake PCoD modelling to further investigate potential effects on seals. This will be provided as part of the Marine Mammals Technical Note.

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62	10.7.1.1.1.2: We welcome that the worst-case scenario is based on SEP and DEP piling together, as this is within the project envelope.	Noted.
63	10.7.1.3.1 (and 10.7.1.3.2): For clarity, the magnitude of the cumulative disturbance impact for grey seals is Medium, as stated in Table 10-114. It is incorrectly stated as Low in Paragraphs 803 and 805. Therefore, the assessment result for grey seal is Moderate Adverse, not Minor Adverse (as stated in Paragraph 809).	Noted.
64	We note that the impact magnitude is correct in Table 10-118. As stated in the general comment 1, we do not consider that the SIP is appropriate mitigation to reduce disturbance to other species. They are also not designed to reduce overall disturbance at the MU-level of harbour porpoise. We therefore cannot agree with the conclusion of a residual Minor Adverse effect on harbour porpoise (at the North Sea MU level) and grey seal. We strongly advise that the Applicant commit to further mitigation at this time to reduce the risk of a significant disturbance effect.	See response at ID 1 of this table.
65	Please see our comments on the Offshore IPMP, as well as comments on monitoring suggested throughout our response.	See response at ID 4 of this table.
Document used: [APP-193] 6.3.10.3 Marine Mammals Cumulative Impact Assessment (CIA) Screening		
66	10.3.2: We consider that the Applicant's approach of only including projects in the GNS for white-beaked dolphin and minke whale is reasonable, given the location of the project.	Noted.
67	10.3.2: Based on Tables 10-124 and 10-125 of the ES chapter, the only negligible impact is water quality; all other impacts have the potential to be minor adverse. Therefore, the rationale that only negligible impacts were screened out of the CIA is incorrect.	This sentence was included in error and should be discounted.
68	The Applicant has summarised the CIA screening in Table 10.3.11 but has not included barrier effects or disturbance to seal haul-outs. The	Inclusion of barrier effects in the CIA was addressed in the ES Scoping assessment [APP-281].

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	Applicant should provide justification as to why these pathways have not been screened in.	The Applicant notes that a justification for excluding cumulative effects at haul-outs was omitted. With reference to the project alone assessment it is unlikely that there will be significant cumulative effects at haul outs given a) the distance of SEP and DEP from haul outs (the nearest haul out at Blakeney Point is 12km from the landfall / cable corridor), b) disturbance ranges from vessels (300 – 600m) and safety requirements to avoid near shore waters and c) habituation to existing traffic. The Applicant will provide a fuller response on the disturbance to seal haul-outs in context of the CIA within a Marine Mammals Technical Note to be submitted at Deadline 3.
69	10.3.2.1: We acknowledge the Applicant's rationale for screening out PTS based on requisite mitigation (to be in accordance with the EPS Regulations). We have general concerns that the geophysical surveys that go through marine licence exemptions are overlooked and may not undertake mitigation to reduce the risk of PTS. However, this is a strategic issue that we have raised with the MMO. We strongly advise that Natural England are consulted on any geophysical surveys undertaken for the SEP and DEP project.	Noted, the Applicant will consult with Natural England prior to geophysical surveys being undertaken in the pre-construction phase.
70	We note that the impacts to prey, as per Hawkins et al. (2014), generates larger impact ranges than that based on the TTS threshold in seals. More broadly, we acknowledge that the limited evidence base on impacts to prey necessitates a series of assumptions (e.g., impacts to marine mammals are greater than that to prey; that impacts are intermittent, temporary and highly localised, with potential for recovery). We have raised concern on some of these assumptions in our comments on the project alone assessment of impacts to prey. Should the Applicant amend the project alone assessment in light of our advice, we request that they also reconsider whether changes to prey availability should be scoped in to the CIA.	Noted – see the Applicant's response at ID 54.
71	Geophysical and seismic surveys are a mobile source, which transit along survey lines, often in a grid pattern over a target area. As these sources move they will encounter many animals on their path, and so more animals will be exposed to the sound than just the number within 12km of the source when treated as a point. There is limited evidence of	As noted at ID 7, the Marine Mammals Technical Note to be submitted at Deadline 3 will include consideration of geophysical and seismic surveys as a mobile source.

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	return in these animals; some tagged porpoises showed strong responses for up to 8 hours (van Beest et al., 2018), though we acknowledge that some may be more resistant and move into the area earlier. The likelihood of animals returning to the area will be lower when surveys are repeatedly going back and forth over a grid area, as then the area will be continuously exposed to noise. Based on these reasons we do not consider it appropriate to treat such surveys as a point source when determining the area of disturbance around them. The Applicant should undertake an assessment of these as mobile sources in the CIA.	
72	Natural England is supportive of the approach of including a nominal one high order UXO clearance on any given day, as outlined in our Best Practice advice.	Noted.
Document used: [APP-194] 6.3.10.4 Marine Mammal Unexploded Ordnance (UXO) Assessment		
73	Natural England understands that this is an illustrative assessment. Our comments on the assessment should be considered when revising the assessment to accompany the Marine Licence application for UXO clearance, which will occur post-consent. Therefore, our comments do not need to be addressed during the Examination process.	Noted. The Applicant welcomes receipt of and will have consideration of the comments on the **Marine Mammal UXO Assessment** [APP-194] during the marine licence application process for UXO clearance. Responses to the remaining NE comments on this assessment and other UXO related matters have not been provided.
Document used: [APP-288] 9.4 Draft Marine Mammal Mitigation Protocol		
74	The Applicant has not provided any information on the anticipated duration of the ADD activation during UXO clearance or piling, nor the principles that would guide the duration. Such information will need to be included in the final MMMP.	Noted, this information will be provided in the final MMMP.
75	The Applicant has not detailed any variation in the strike rate during the soft-start and ramp up procedure. A low strike rate has been included in the most-likely scenario for piling, but not in the maximum design scenario for piling, in the underwater noise modelling. The Applicant should clarify whether variation in strike rate is being included as a possible mitigation measure.	As detailed in **Appendix 10.2 - Underwater Noise Modelling Report** [APP-192]; the main difference between the worst case and most likely scenarios are that the most likely scenario uses lower blow energies and utilises a soft start procedure whereby single blows of the piling hammer occur at low energy, interspersed with pauses of several minutes before commencing a more continuous strike rate, before ramping up to maximum energy. This takes into account the recommended mitigation use of a soft start advised by the JNCC (2010) guidance. The assessment has been undertaken based on

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		the worst-case scenario with results also being presented for the most-likely scenario.
76	Note that the final noise modelling, undertaken post-consent when project design is finalised, should reflect all mitigation measures such as low strike rate. This will ensure accurate PTS ranges are modelled, and mitigation can be applied in a proportionate way (e.g., ADD activation duration).	Noted, this information will be provided in the final MMMP.
Document used: [APP-289] 9.5 Offshore In Principle Monitoring Plan		
77	The marine mammal section of the Offshore In-Principle Monitoring Plan is short and lacking on detail. There has been no consideration of the areas of the assessment where assumptions have been made and where the project could contribute to filling knowledge gaps that would inform the project's assessment. These should be detailed in Section 1.4.6. At present, the only detailed monitoring that has been proposed is the industry-standard monitoring of underwater noise from the first 4 piles. The other two measures are targeted at monitoring the effectiveness of mitigation measures, namely the MMMP and SIP. Insufficient detail has been provided to understand how these would be monitored. Natural England are concerned that no monitoring has been outlined that would evidence the impacts to marine mammals e.g. monitoring of animal responses to impacts. Further detailed discussion is required on the monitoring plans. We understand that this is proposed to occur post-consent. However, at present we have limited understanding, and so confidence, in how the monitoring will evidence the outcomes of the marine mammal assessments. In this response we have identified several areas which could be suitable targets for monitoring. These should be considered by the Applicant when updating this document.	See the Applicant's response at ID 4 of this table.

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78	1.4.6.2: The Applicant should list any strategic monitoring that it is aware of e.g., through the Offshore Wind Strategic Monitoring Research Forum that it would consider appropriate for post-consent monitoring of marine mammals.	This will be included in the updates to the Offshore IPMP to be submitted at Deadline 3.
Document used: [APP-290] 9.6 In Principle Site Integrity Plan for the Southern North Sea Special Area of Conservation		
79	We welcome that a timeline of the SIP has been included in the draft DCO conditions. Natural England's position on the SIP condition timelines is that the final SIP should be produced no Earlier than 9 months prior to works and no Later than 6 months prior to work.	The submission period for the SIP has been updated from no later than 4 months to no later than 6 months in the **Draft DCO (Revision D)** [document reference 3.1]. This change was also requested by the MMO.
80	Natural England maintains its concern over the system that is currently in place to manage multiple SIPs. We infer that the noise management mechanism alluded to by the Applicant is the SNS Activity Tracker, which is more of a tool to monitor projects planned to occur at the same time, and is not itself a management mechanism. There is currently no process in place to manage multiple projects/SIPs where an exceedance of the thresholds has been identified.	See the Applicant's response at ID 23 of this table.
81	We highlight that the current approach of scheduling activities, in advance of their commencement, led to the seasonal threshold almost being exceeded in summer 2022. Given the number of OWF projects predicted to undertake construction in the vicinity of the SNS SAC before 2030, it is strong possibility that the seasonal threshold could be exceeded without additional mitigation in place (i.e. to reduce noise emissions in the SNS SAC on a project-specific basis). The current approach of a condition to co-ordinate timing is highly unlikely to be sufficient to avoid seasonal thresholds being exceeded in the near future, because co-ordinating timing does not help to reduce the disturbance over a season; it is aimed at keeping under the daily threshold. The most effective way that the impact of noisy activities can be managed down is through noise abatement systems (NAS). There are several different types of NAS but all of them work to reduce the level of noise generated at source, therefore reducing the area that is ensonified and reducing the overall impact to marine mammals from the project	See the Applicant's response at ID 23 of this table.

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	alone. We encourage the use of NAS on this project, especially where it would reduce the overlap between the project and the SNS SAC. NAS could be committed to at this time, rather than waiting until closer to the works begin, particularly when at this time financial decisions will already have been made and it is unclear whether new mitigation could be introduced. To illustrate the possible benefits of NAS: if NAS was included as standard for any monopiles within 26 km of the SNS SAC, then the EDR would be reduced to 15 km. There would therefore be no overlap between the SEP wind farm site and the SNS SAC; and no overlap between the DEP wind farm site and the SNS SAC winter area. The only remaining concern would be the DEP wind farm site and the summer area of the SNS SAC. For illustrative purposes, it would be beneficial to present the area of overlap between the SNS SAC and the project if noise abatement systems were used with monopiles as standard (i.e. using a 15km EDR), both as a km^2 and as a percentage of the relevant seasonal area of the SNS SAC. In addition, the remaining overlap between the DEP site and the SNS SAC summer area, could be avoided through a commitment to undertake piling out with the summer season at this location specifically. This would only be needed for locations within 15km of the summer area – it would be beneficial for the Applicant to present this. The DEP installation window, of 3 months, could fully occur within the 'winter' season (October-March inclusive).	
82	The Applicant should update the in-combination assessment in the SIP at the time of finalisation. They should ensure that the following updates are included: • Whether oil and gas construction could overlap with the project, based on the recent announcement of the new North Sea licensing round for oil and gas.	Noted.

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	• Reflects the possibility of simultaneous piling at the wind farms that could be piling at the same time. • Please also see the comments made on the in-combination assessment in the RIAA. The summary of the in-combination assessment in the SIP should reflect changes made in the RIAA following these comments.	
Document used: 5.4 Report to Inform Appropriate Assessment		
83	As was previously agreed, the Applicant has screened out the Berwickshire and North Northumberland Coast SAC for grey seal. Since the completion of the HRA Screening, further information has been published (Carter et al., 2022) which has reported that the maximum foraging range of grey seals is 448 km. The closest distance between the project and this SAC is 284 km, therefore the Berwickshire and North Northumberland SAC is within the foraging range. Natural England considers that there is potential connectivity between the Berwickshire and North Northumberland Coast SAC and the project area, though the level of connectivity is likely considerably lower than that for the nearer Humber Estuary SAC. Consequently, we consider that the outcome for the Humber Estuary SAC represents that most precautionary assessment for grey seal sites, and any potential impact to the Berwickshire and North Northumberland SAC would be lower.	Noted.
84	As previously commented, mitigation cannot be taken into account in the assessment of LSE, in accordance with the People over Wind court judgement (Case C-323/17 People Over Wind v Coillte Teoranta). It is therefore not appropriate to state that because an effect is mitigated there will be no potential for LSE. This pathway (physical and permanent auditory injury, Table 8-6) should therefore be taken through to Stage 2 of the HRA i.e., assessed for AEoI. This being said, we would not expect an AEoI on the site from this pathway due to the mitigation proposed and secured through the MMMP.	Noted.
85	Some of our previous comments on the seal baseline characterisation are also applicable to the RIAA due to the same approach being used	As noted at ID 4, any further assessments prior to construction for the final design, if required, will be based on the latest information and guidance at that

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	(in relation to using August counts; mismatch between spatial scales of density and abundance and so underestimation of impacts). Amendments made in light of these comments should also be applied to the RIAA.	time. This will include any updates to seal abundance, density, and reference populations. However, as Natural England are "*satisfied that the figures presented represent the worst-case scenario*", no further updates to these are required for the Examination.
86	8.2.3.2.1 (and 8.2.4.2.1): The Applicant has proposed to use two different scales of reference population, one for the project alone against the local SAC and MU population, and one for the project in-combination against the wider MU (termed the in-combination reference population). We have concerns about this approach. In particular, this will result in no in-combination assessment against the local SAC population. We are particularly concerned about the lack of in-combination assessment, i.e., assessment of the impact of multiple projects on the Wash and North Norfolk Coast SAC specifically, given the population's recent decline. It is therefore imperative that in-combination impacts to this site specifically are fully assessed.	This will be addressed in the Marine mammals Technical Note to be submitted at Deadline 3.
87	8.2.3.4 (and 8.2.4.4): Natural England has provided Supplementary Advice to the Conservation Objectives (SACO) for the Humber Estuary SAC (and Wash and North Norfolk Coast SAC). The SACO for the site acknowledges the importance of connectivity between the "habitat within sites and wider environment…to allow movement of migratory species." It is therefore important to consider impacts to functionally habitat outwith the site, not only in the site. Hence we do not agree with the assessment of no LSE to the habitats of qualifying species conservation objectives listed (Table 8-8), given the evidence presented so far. It would be precautionary to take these assessments through to Stage 2 of the HRA.	See response at ID 9 of this table.
88	8.2.3.4: We are supportive of the Applicant considering disturbance to seals foraging at-sea.	Noted.
89	Natural England has completed our update to The Wash and North Norfolk Coast (WNNC) Special Area of Conservation supplementary advice on conservation objectives for Harbour (common) seal (Phoca vitulina). We hope to publish the updated conservation advice at the	See response at ID 33 of this table.

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	next available opportunity in March 2023. However, we have enclosed a copy of our finalised draft advice (Appendix D1) to aid in the undertaking of any Habitats Regulation Assessment. This adds further weight to the overall unfavourable conservation status of the species, and the species in the site. It also adds further importance to taking a more precautionary approach in the assessment and/or when interpreting the assessment conclusions. Therefore, the Applicant must ensure that the project will not hinder (neither stop nor slow) the recovery of the species in the site.	
90	8.3.1.1: It is not clear what the Applicant means by soft start and ramp up. Natural England considers that the soft start, as detailed in the MMMP, is mitigation rather than project design. We acknowledge that an element of starting at lower energies and ramping up would be implemented irrespective of marine mammal mitigation. However, the specific nature of the soft start, e.g., starting at lowest energy possible, ramping up over 30 minutes, low strike rate (if included), has been designed to be in accordance with the mitigation guidelines. Hence our position that this mitigation should not be included in the assessment of LSE (as per previous comments). We note that in Section 8.4.1.1.1.1.1, the Applicant has included mitigation in the assessment of AEoI, which we consider to be the correct approach.	The Applicant acknowledges that Table 8-11 of the **RIAA** [APP-059] does not specify the soft-start criteria to be implemented through the MMMP. The specific criteria for the soft-start and ramp up will be in accordance with the mitigation guidelines at the time and will be approved through the final MMMP however an outline process is described in Section 1.4.1.5 of the **Draft MMMP (Revision B)** [REP1-013].
91	8.3.1.2: In Table 8-12 the Applicant has listed a series of measures on co-ordination with piling should high order clearance be needed. Whilst we are supportive in principle of such measures, they need to be secured (either in the UXO MMMP, or UXO licence conditions) for Natural England to take them into consideration. The Applicant should consider how these measures will be secured at the time of applying for their UXO licence.	Noted, the Applicant will consider how these measures will be secured at the time of applying for the UXO licence.
92	8.4.1.1.1.1.2.2: We request assurance from the Applicant that the assumption of one location being complete per day is appropriate for pin piles, where 4 piles need to be installed with associated set up in between.	The Applicant confirms that the assumption of one piled jacket foundation installation per day is appropriate. Installation of each pin pile is anticipated to take up to 3 hours, so for 4 pin piles this would be a total of up to 12 hours with a further 12 hours being sufficient for set up in between.

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93	Furthermore, we request clarification on what is meant by a recovery day, what activity would occur on a recovery day? As these have been included as a day of disturbance in Table 8-19.	As assessed in the BEIS (2020) '*The precise pile-driving schedules for all the wind farms are unknown and it is likely that some may undertake more pile-driving each month or season than would be predicted if an average was used. Furthermore, if pile-driving is not continuously undertaken on a daily basis, consideration of the recovery period is required as this increases the overall number of days during which the impacts from disturbance are predicted to occur'* this is therefore precautionary and a worst-case scenario that has been applied to the assessment.
94	8.4.1.1.1.1.2.2: To note, we consider that ADD activation for 55 minutes will disturb (most) harbour porpoise to a minimum of 4.95km. The value of 4.95km is based on an animal starting next to the ADD and fleeing at a constant swimming speed of 1.5m/s. However, the ADD could induce a startle response in animals already at distance from the ADD and lead to larger impact areas. To illustrate, a median ADD deployment of 66 minutes resulted in disturbance out to 12 km in Dahne et al. (2017). Whilst we consider that harbour porpoise disturbance to 12 km is more appropriate than the 4.95 km detailed, we acknowledge that this disturbance range does not overlap with the SNS SAC, therefore the conclusions of the Applicant remain valid. Monitoring of disturbance due to ADD activation could be considered for post-consent monitoring.	Noted.
95	8.4.1.1.1.2.2.1: Whilst this is a minor point, it is not clear how the overlap of both SEP and DEP sites over the winter area of the SNS SAC (30.45 km^2 – Table 8-24) is less than the overlap of DEP site alone (32.7 km^2 – Table 8- 18). The latter number may be incorrect. Nonetheless, the sum of the SEP and DEP overlaps with the winter SNS SAC in Table 8-18 is only marginally more than DEP alone therefore we expect that the assessment conclusion remains valid.	This will be clarified within a Marine Mammals Technical Note to be submitted at Deadline 3.
96	8.4.1.1.1.2.2.1: Based on the information in Table 8-13, it appears that simultaneous piling at one site (i.e. SEP or DEP) is within the project envelope. Whilst simultaneous piling across sites may represent the worst-case spatial area, it is unlikely to represent the worst-case spatial overlap with the SNS SAC because of the differing distances between	The Applicant clarifies that simultaneous piling in either SEP or DEP is a potential option. Modelling was undertaken for the NE and SE locations within DEP (See **Appendix 10.2 - Underwater Noise Modelling Report** [APP-192]). This can

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	the sites and the SNS SAC. Indeed, simultaneous piling at the DEP site would lead to greater overlap with the SNS SAC summer area than has been presented and would be the worst-case scenario. We advise that this scenario, of simultaneous piling at DEP site, must be assessed as it is the worst-case. In this scenario consideration should be given to the maximum separation distance of such simultaneous piling, and whether a maximum separation distance should be considered to be secured as a mitigation measure, to reduce the project's overall contribution to disturbance at the SNS SAC. Similarly simultaneous piling at DEP would also likely represent the worst-case overlap with the winter area of the SNS SAC.	be applied to further inform the potential overlap with the SNS SAC for a simultaneous piling scenario and will be addressed within a Marine Mammals Technical Note to be submitted at Deadline 3.
97	8.4.1.1.1.2.2.2 The Applicant has used a value of 53 days for foundation installation. This number however should be 55 days, to take into account 2 piling days for installation of the OSPs.	If piled, the OSPs will use pin piles. OSPs are therefore not relevant to the assessment as these will use pin-piles and be located to the landward side of SEP and DEP to connect into the export cable corridors and the SNS SAC would therefore be beyond the 15km pin pile EDR.
98	We welcome the Applicant's inclusion of studies that have monitored the behavioural response of harbour porpoise to piling construction vessels. These empirical observations provide useful context to the modelling results.	Noted.
99	As water quality changes have been assessed as negligible in the ES chapter, we agree with the conclusion that any water quality changes will not significantly affect harbour porpoise and other marine mammals.	Noted.
100	8.4.1.1.7.1.4: The Applicant has based their assessment of impacts to prey on fish with a swim bladder involved in hearing and a fleeing response. This represents the most sensitive receptor group, but uses a less conservative assumption of fleeing. Sandeel is an important prey species for marine mammals, are unlikely to be as sensitive to noise impacts, however it is not clear whether a fleeing response would be appropriate for this species group. It would be beneficial for the Applicant to undertake a brief assessment of impacts to sandeel specifically, using appropriate assumptions about auditory and behavioural response.	See ID 54.

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101	8.4.1.1.7.1.4: The Applicant has not made any reference to the behavioural response distances of prey based on Hawkins et al. (2014), which is detailed in the ES chapter, and are inferred to be larger than those derived through the underwater noise modelling. An assessment based on these larger distances should be undertaken against the various marine mammal sites. This is of particular importance where these larger distances would lead to direct overlap between prey impact distances and designated sites. This pathway should also be reconsidered for the in-combination assessment.	As discussed at ID 54, the assessment is illustrative of an area of effect (based upon potential behavioural response impact ranges and areas for prey species). However, the assessment is not stating that underwater noise sterilises the areas of prey, does not indicate any mortality of prey and does not take into account that the mammals will be disturbed from the area themselves. As discussed in ID 53 the assessment is based on the worst case effects on prey and does not take into account the fact that many species (such as sandeel) will not be affected.
102	8.4.1.1.7.1.4: To note, the mitigation proposed by the Applicant will only work for fish that flee. Fish that do not show a fleeing capability will not benefit from measures such as ADDs or soft start. Even in those species with some fleeing capability, there is little research to suggest that fleeing responses are prolonged and directional (i.e. away from noise). The mitigation measure that would benefit all fish species would be a reduction in the noise emitted, e.g. by using noise abatement systems. Therefore, as per general comment 1, the measures in the MMMP have limited benefit for prey species.	As previously discussed (ID 1), mitigation may reduce impacts upon fish, dependent on the mitigation chosen, but the assessment in Section 8.4.1.1.7.1 of the **RIAA** [APP-059] does not rely on the MMMP as mitigation to conclude no potentially significant (AEOI).
103	We consider that the list of offshore wind farms that may be piling in 2028 is appropriate given current knowledge of projects. When the SIP for the SNS SAC is updated closer to construction, potentially, additional projects need to be included in the updated in-combination assessment therein.	The Applicant welcomes this position.
104	8.4.1.6.1: Natural England notes that simultaneous piling is within the scope of SEP&DEP, and would have advised the in-combination assessment to include simultaneous piling at SEP and DEP. It is possible that Dogger Bank South (DBS), which comprises two projects (DBS East and West), will have concurrent piling between these two projects. Similar applies to the two East Anglia Hub projects (ONE North and TWO). Simultaneous piling is also within the scope of Hornsea 4. We consider it a possibility that the worst-case scenario could be greater	As noted in this section of the **RIAA** [APP-059], the in-combination assessment has been based on a single piling event within SEP or DEP, with single piling occurring in the other Offshore Wind Farms (OWF), as it is considered unlikely that all OWFs would or could be undertaking simultaneous piling all at the same time. The approach to the in-combination assessment, based on single piling, would allow for some of the OWFs not to be piling at the same time while others could be simultaneously piling. This is considered to be a realistic worst-case scenario, as it is highly unlikely that all OWFs would or could be

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	than what has been assessed (single piling at each project), especially due to the targets for offshore wind by 2030. However, including a greater number of piling events would not affect the outcome of the assessment as it is already predicted to exceed the disturbance thresholds for the SNS SAC. The Applicant proposes to manage this through the SIP. The SIP must be based on the understanding of in-combination piling scenarios at the time, which therefore would capture simultaneous piling. There are mitigation measures available to SEP&DEP which could result in the avoidance of overlap between the project and the SNS SAC. If implemented, this would remove the need for a SIP. Natural England considers this would be a beneficial way to proceed given our current concerns over managing multiple SIPs, as outlined in this response. This would potentially reduce risk to project if the current SIP process cannot does not give us confidence in the conclusion of no AEoI on the SNS SAC, given the number of offshore wind farms due to construct before 2030.	simultaneously piling at exactly the same time or even on the same day as piling at SEP and / or DEP. In relation to the SIP see ID 23.
105	8.4.1.6.1.2: The seasonal averages presented by the Applicant do not represent the whole season; they only represent the contribution of those 33/26 days on which SEP&DEP are piling. This is not the correct way to present the seasonal average as it does not take into account the noisy activities occurring during the remainder of the season. Therefore, the conclusion that this demonstrates that the seasonal threshold would not be exceeded is incorrect. We advise the Applicant to present an assessment of the disturbance due to piling across the whole season. This applies to all seasonal assessments undertaken. It is of particular importance that this is applied to the overall in-combination assessment in Table 8-53.	The seasonal averages will be reviewed and re-presented if required within the Marine Mammals Technical Note to be submitted at Deadline 3.
106	8.4.1.6.2.5.1: As per our comment on the ES chapter/CIA screening, we advise that seismic and geophysical sources should be assessed as mobile sources in the assessment. The Applicant should use the available evidence to inform a realistic assessment of disturbance from seismic and geophysical vessels per day. For example, they could use	As noted at ID 7, the Marine Mammals Technical Note to be submitted at Deadline 3 will include consideration of geophysical and seismic surveys as a mobile source.

ID	Relevant Representation	Applicant Response
	the information on Marine Noise Registry, or in BEIS HRAs, on past surveys.	
107	To note, we only consider the assessment conclusion for all noise sources in-combination (i.e. presented in Section 8.4.1.6.3) as relevant. It is not appropriate to conclude no AEoI between individual sectors and SEP and DEP as this does not represent that full in-combination scenario.	Noted.
108	Table 8-53 presents that the number of harbour porpoise potentially disturbed could exceed a significant effect in both EIA and HRA terms. In terms of EIA, the Applicant has presented that 5.25% of the NS MU population of harbour porpoise may be disturbed. This is over the Applicant's threshold of a significant effect (for temporary effects) – temporary impacts that affect more than 5% of the population have the potential to have long term significant impacts on the population (see Paragraph 408). Note that the NS MU population is used as the reference population for the SNS SAC, hence its relevance to the RIAA. In terms of HRA, the Applicant has presented that 12.0% of the winter area of the SNS SAC could be subject to noise disturbance in an in-combination scenario over the season. This is in exceedance of the 10% threshold for significant disturbance over a season. The Applicant states that the measures in the SIP will mitigate disturbance, however as detailed in general comment 1 we disagree with this. We therefore require further safeguards which ensure that a significant impact to the NS MU population will not occur. The applicant must present further information which demonstrates that a significant effect/AEoI could not occur on the harbour porpoise feature of the SNS SAC as a result of in-combination underwater noise. Specifically, what would happen in the event that there are multiple other OWF construction or noise producing projects proposed at the same time.	The Applicant notes that the exceedance of the 5% threshold thresholds predicted by the underwater noise assessment from all sources, as summarised in Table 8-53 of the **RIAA** [APP-059] are in the absence of mitigation that will be implemented through the SIPs for all relevant projects. The Applicant considers the SIP to be the appropriate framework through which disturbance to the harbour porpoise feature of the SNS SAC should be mitigated. See the response at ID 1 and ID 23 of this table.
109	We defer to NatureScot for advice on impacts to the Moray Firth SAC.	Noted.

ID	Relevant Representation	Applicant Response
110	In Table 8-16 the Applicant has presented that 24 individuals could be affected at the SEP site, stating that this equal to 0.11% of the east coast of Scotland population. Can the Applicant please confirm that this is a typographical error, and should read 0.24?	The Applicant notes that this is in relation to Table 8-61 of the **RIAA** [APP-059] and confirms that this is a typographical error and should read 0.24.
111	The greatest concern with regards to the coastal east Scotland/Moray Firth bottlenose dolphin population is impacts in the coastal area where this population is more commonly observed. It is important that the future UXO assessment considers the overlap between the impact ranges around UXO clearance and the more coastal habitat of this population.	Noted, this will be considered through the marine licensing process for UXO clearance.
112	8.4.3.1.1: The Applicant has predicted that 382 grey seals, or 9.8% of the Humber Estuary SAC population, may be at risk of disturbance (based on TTS as a proxy). This is higher (almost double) the Applicant's threshold for a significant effect. As detailed in general comment 1, we consider it not appropriate to say that the MMMP will reduce the likelihood of disturbance to grey seals. We are therefore not satisfied that the mitigation will reduce the risk of a significant effect on the population and require further information from the Applicant to justify their assessment conclusion. One part of this is evidence to support the Applicant's assertion that not all animals would be from the Humber Estuary SAC. The Applicant should provide further information on the assessment of disturbance to grey seals of the Humber Estuary SAC during simultaneous piling, to demonstrate no AEoI.	The Applicant will address the approach to disturbance to grey seals and potential impacts on the Humber Estuary SAC in the Marine Mammals Technical Note at Deadline 3.
113	8.4.3.1.4 (and 8.4.4.1.4): In the assessment of barrier effects on seals, we request to see information on: • Likely movements/pathways of seals from the nearby SACs, based on telemetry data • Location of the barrier effect in relation to these movements • Area lost due to barrier effect as a proportion of available habitat, with consideration of access to areas beyond the area of barrier effect. To note, whilst the effect may be temporary it may overlap with the most	See response at ID 49.

ID	Relevant Representation	Applicant Response
	sensitive periods for seals, the breeding season, when seals may also have the lowest adaptability to forage in other areas.	
114	8.4.3.1.9: Strictly the Applicant has not assessed the worst-case area of disturbance to fish; this should be the in- combination area of disturbance to fish during simultaneous piling, which is 680 km^2 (Table 5-83, Volume 3 Appendix 10.2 Underwater Noise Modelling Report) or even higher if based on Hawkins et al. (2014). Note that this also applies to the same impact assessment for harbour seals in Section 8.4.4.1.9.	The Applicant notes that the slightly larger impact range from simultaneous piling would have no material effect on the assessment conclusions and does not intend to provide an update during Examination.
115	8.4.3.4: Based on the Applicant's in-combination assessment of potential disturbance in Table 8-47, up to 1,610 individual grey seals may be impacted. This is equivalent to 41.3% of the SAC, and 6.68% of the wider reference population. We do not agree with the Applicant's assessment that this is not significant. The Applicant has come to this conclusion based on: • It being a highly precautionary assessment – however they have not presented any way to reduce the level of precaution and so get a better understanding of what a "realistic" level of precaution would mean for the number of animals affected; • Taking into account mitigation for UXO – because the worst-case UXO clearance is still high order and ADDs, which would cause a high level of disturbance; • Taking into account the SIP – because the SIP is not aimed at reducing disturbance for other species, and most measures in the SIP would not reduce disturbance for grey seal. We require further evidence from the Applicant to demonstrate how this number of animal disturbed would not have an AEoI on the Humber Estuary SAC. In particular, we request the Applicant consider what appropriate mitigation could be secured at this stage to reduce the number of individuals which may be disturbed.	The Applicant notes that this comment is in relation to Table 8-74 and the assessment conclusion which precedes it. The Applicant maintains its position as described at ID 1 that measures to reduce the potential significant disturbance of harbour porpoise in the SNS SAC (through noise reduction or avoidance) could also reduce the potential for any significant disturbance in other marine mammal species. The total impact assumes that nine wind farms would be piling simultaneously. This is highly unrealistic given experience of construction in the southern North Sea to date, even given Government targets this is unlikely to occur. In addition, it is unlikely that a developer would construct two projects at the same time, construction would move from one site to the next to expedite commencement of generation. It is relevant to highlight the worst-case for UXO as this is a significant contributor to the in-combination total. It is highly likely that low order techniques will be required, making this an over-estimate. In addition, it is worth noting that the single biggest source of impact in the assessment (approximately 1/3 of the magnitude) is due to seismic survey which is ongoing and unrelated to offshore wind. The Applicant will further consider the conclusions of the assessment in the Marine Mammals Technical Note at Deadline 3 and will present dose response curves for the relevant species.

ID	Relevant Representation	Applicant Response
116	8.4.4.1.7: Upon further reading it appears that the Sheringham Shoal Offshore Wind Farm did not undertake any pile installation in 2012 (see URL in RR-063]). Indeed, Russell et al. (2016) demonstrated that harbour seals showed significant decrease in usage up to 25 km from the piling activity. We therefore do not consider that harbour seals will still undertake foraging activity, at least during piling activities. Russell, D.J., Hastie, G.D., Thompson, D., Janik, V.M., Hammond, P.S., Scott-Hayward, L.A., Matthiopoulos, J., Jones, E.L. and McConnell, B.J., 2016. Avoidance of wind farms by harbour seals is limited to pile driving activities. Journal of Applied Ecology, 53(6), pp.1642-1652. Note that this also applies to Section 10.6.1.3 of the ES Marine Mammal Chapter.	Paragraph 880 states "*SOW was undergoing construction, with turbine installation undertaken from 2011 to 2012, and cabling works from 2010 to 2012. This indicates that harbour seal will still undertake foraging activity during wind farm construction activities.*" There is no implicit link to piling (turbine installation is not piling). Note that Russell et al (2016) was used to screen those designated sites considered for disturbance effects based on the 25km range quoted.
117	8.4.4.1.1, 8.4.4.1.4, 8.4.4.1.7, 8.4.4.4: We advise that the Applicant present an assessment of disturbance of harbour seals during piling, using the 25km disturbance range from Russell et al. (2016). This range, gathered through empirical data, is considered more likely to be accurate than using TTS as a proxy. Given the overall status of the Wash and North Norfolk Coast SAC harbour seal feature, it is important that the assessment is precautionary and shows the full possible impact.	The Applicant will address the approach to disturbance to harbour seals and potential impacts on the Wash and North Norfolk Coast SAC in a Marine Mammals Technical Note at Deadline 3.
118	For the Applicant to note: in response to the harbour seal decline in the Wash and North Norfolk Coast SAC, Natural England is looking to further research to investigate the possible causes of decline. The cause of the decline is unknown but has occurred over a timeframe of significant increase in both grey seals and offshore wind farms in the area. How these may be interacting with harbour seals, perhaps through affects to prey, will be one of the likely focusses of any further research. This could be an area to consider for post-consent monitoring.	See response at ID 4 of this table.

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