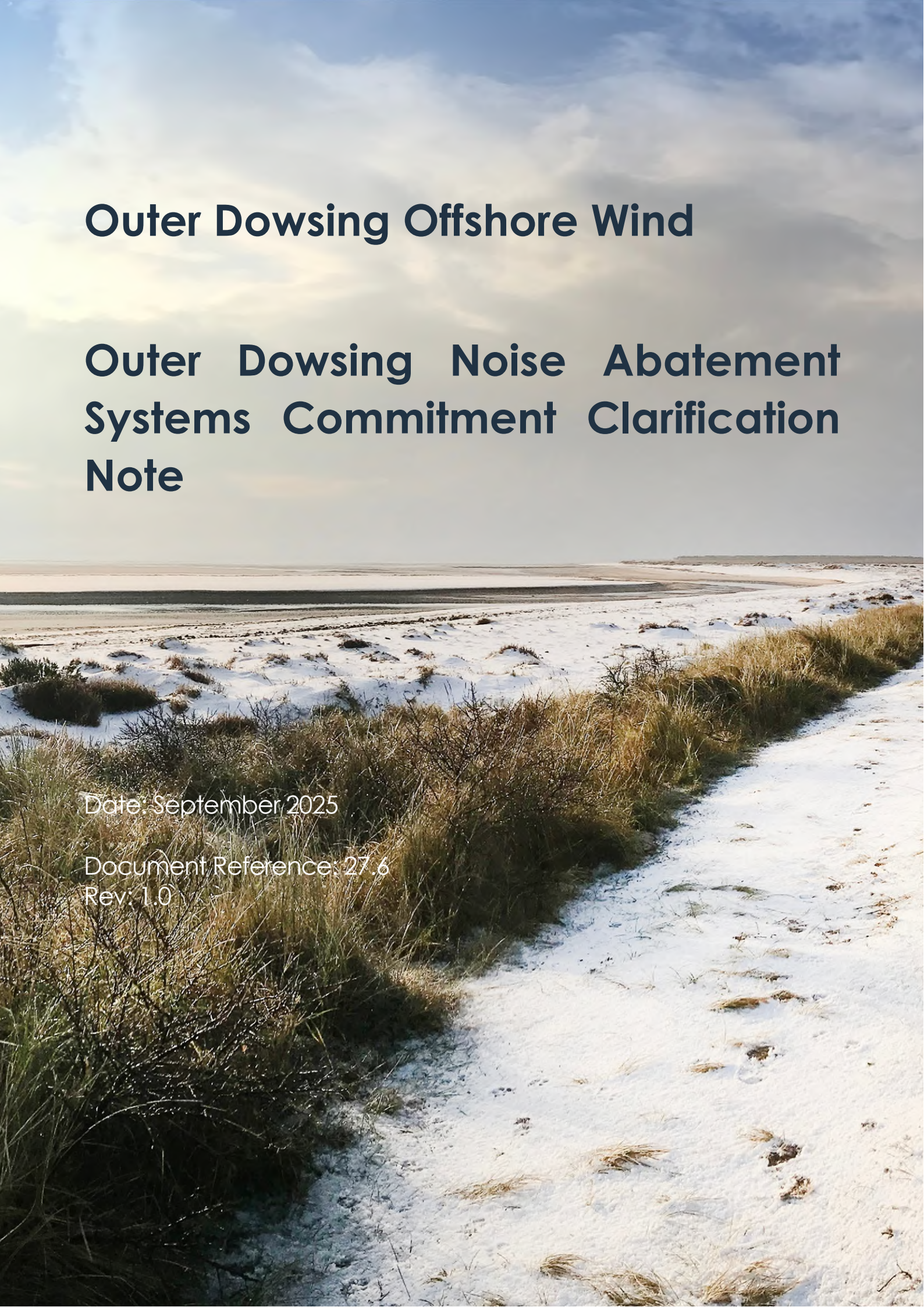
Outer Dowsing Offshore Wind

Outer Dowsing Noise Abatement Systems Commitment Clarification Note



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Acronyms & Definitions

Abbreviations / Acronyms

Abbreviation / Acronym	Description
ADD	Acoustic Deterrent Device
ANS	Artificial Nesting Structure
BBC	Big Bubble Curtains
DBBC	Double Big Bubble Curtains
DCO	Development Consent Order
EDR	Effective Deterrent Range
EIA	Environmental Impact Assessment
EPS	European Protected Species
ES	Environmental Statement
EU	European Union
GT R4	The Applicant. The special project vehicle created in partnership between Corio Generation (and its affiliates), Gulf Energy Development and TotalEnergies
HRA	Habitats Regulations Assessment
HSD	Hydro sound Dampers
JNCC	Joint Nature Conservation Committee
MHWS	Mean High Water Springs
MLWS	Mean Low Water Springs
MMMP	Marine Mammal Mitigation Protocol
MMO	Marine Management Organisation
NAS	Noise Abatement Systems
NE	North-east
NMS	Noise Mitigation System
NW	North-west
ODOW	Outer Dowsing Offshore Wind (The Project)
ORCP	Offshore Reactive Compensation Platform
PADSS	Principle Areas of Disagreement Statement Summaries
PTS	Permanent Threshold Shift
SAC	Special Area of Conservation
SIP	Site Integrity Plan
SW	South-west
UXO	Unexploded ordnance

Terminology

Term	Definition
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation (and its affiliates), Total Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation, TotalEnergies and GULF.
Cumulative effects	The combined effect of the Project acting additively with the effects of other developments, on the same single receptor/resource.
Cumulative impact	Impacts that result from changes caused by other past, present or reasonably foreseeable actions together with the Project.
Development Consent Order (DCO)	An order made under the Planning Act 2008 granting development consent for a Nationally Significant Infrastructure Project (NSIP).
Effect	Term used to express the consequence of an impact. The significance of an effect is determined by correlating the magnitude of the impact with the sensitivity of the receptor, in accordance with defined significance criteria.
Environmental Impact Assessment (EIA)	A statutory process by which certain planned projects must be assessed before a formal decision to proceed can be made. It involves the collection and consideration of environmental information, which fulfils the assessment requirements of the EIA Regulations, including the publication of an Environmental Statement (ES).
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Habitats Regulations Assessment (HRA)	A process which helps determine likely significant effects and (where appropriate) assesses adverse impacts on the integrity of European conservation sites and Ramsar sites. The process consists of up to four stages of assessment: screening, appropriate assessment, assessment of alternative solutions and assessment of imperative reasons of over-riding public interest (IROPI) and compensatory measures.
Impact	An impact to the receiving environment is defined as any change to its baseline condition, either adverse or beneficial.
Mitigation	Mitigation measures are commitments made by the Project to reduce and/or eliminate the potential for significant effects to arise as a result of the Project. Mitigation measures can be embedded (part of the project design) or secondarily added to reduce impacts in the case of potentially significant effects.
Offshore Export Cable Corridor (ECC)	The Offshore Export Cable Corridor (Offshore ECC) is the area within the Order Limits within which the export cables running from the array to landfall will be situated.
Offshore Reactive Compensation Platform (ORCP)	A structure attached to the seabed by means of a foundation, with one or more decks (including bird deterrents) housing electrical reactors and switchgear for the purpose of the efficient transfer of power in the course of HVAC transmission by providing reactive compensation.

Term	Definition
Outer Dowsing Offshore Wind (ODOW)	The Project.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.
Project design envelope	A description of the range of possible elements that make up the Project's design options under consideration, as set out in detail in the project description. This envelope is used to define the Project for Environmental Impact Assessment (EIA) purposes when the exact engineering parameters are not yet known. This is also often referred to as the "Rochdale Envelope" approach.

Executive Summary

The Applicant produced this clarification note to provide an explanation of the commitment for Noise Abatement Systems (NAS) and details of the development of the commitment during examination and the further amendments post examination. Throughout examination the Applicant updated the NAS commitment to align with guidance (Defra 2025) and at Deadline 6 submitted a final update to the commitment wording. At the end of examination, Natural England had outstanding concerns for marine mammals within the Risk and Issue Log (REP6-153) (see Section 5 for full details), for which they advised a commitment to NAS would resolve, these include:

- the impact assessments for piling and that the Applicant should commit to using NAS (Point 3);
- the Southern North Sea Special Area of Conservation (SAC) Site Integrity Plan (SIP) and that the Applicant should commit to mitigation measures such as NAS (Point 15); and
- the conclusion of no Adverse Effect of Integrity (AEoI) for the Southern North Sea SAC and that the Applicant should commit to mitigation measures such as NAS (Point 18).

Additionally, in Appendix E4 Natural England's Advice on Marine Mammals (REP6-148), Natural England stated that they:

- cannot agree to the conclusion of no AEoI on harbour seals or grey seals because of the high proportion of animals expected to be disturbed by underwater noise caused by piling from the project in combination with other projects and that the Applicant should commit to NAS.

At Deadline 4, in effort to resolve these issues and to be in line with the updated Defra (2025) policy released in January 2025, the Applicant committed to:

> *"use best endeavours to deliver noise reductions through the use of primary and/or secondary noise reduction methods."*

Natural England had concerns around the use of 'best endeavours' within the commitment, but stated that the draft wording of the commitment proposed by the Applicant and sent to Natural England on 1st April 2025:

> *"goes some way to commit to NAS in the way Natural England have been requesting and is a significant step towards resolving the issue"*

Following this feedback, the Applicant updated the commitment at Deadline 6 to resolve Natural England's concerns and it stated:

> *"The Applicant has committed to deploy primary and/or secondary noise reduction methods (Noise Abatement Systems) for pile driving, unless otherwise agreed with the Marine Management Organisation (MMO).".*

Furthermore, the Applicant updated draft Marine Licence (dML) Condition 13(f) of Schedules 10 and 11, and Condition 11(e) of Schedules 12, 13, 14, and 15 of the draft DCO (AS-042) at Deadline 6 to state:

"The marine mammal mitigation protocol must include consideration of deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling activities. The marine mammal mitigation protocol must include full details and justification for the mitigation chosen or excluded for deployment."

In addition to the clarification of the updates made at Deadline 6, the Applicant provided Natural England with further noise modelling at the worst-case location for noise propagation in the array (North-East (NE)) which reflects the updated NAS commitment and illustrated the consequent benefits on the predicted noise levels at ranges from the source. The modelling showed the updated impact ranges are reduced to 100 m (mitigated), from a maximum of 2 km for harbour porpoise and 5 km for minke whale (unmitigated, as presented in Chapter 11 Marine Mammals (REP6-021)). These reduced impact ranges would require smaller or even no Acoustic Deterrent Device (ADD) deployment, reducing overall disturbance.

Following the original clarification note presented to Natural England, the Applicant and Natural England held a meeting on 9th June 2025. Natural England provided additional advice on the 11th July 2025 and requested that the Applicant provide further clarification and modelling of the reductions possible by implementing NAS.

The additional modelling has been provided within Section 5, and shows the reduction in predicted SEL contours at 5 dB increments for the Wash and North Norfolk Coast SAC, Humber Estuary SAC and Southern North Sea SAC, for their respective worst-case scenarios. Effective Deterrent Ranges (EDR) are also presented for the Southern North Sea SAC. When mitigated, within the Humber Estuary SAC the number of grey seals disturbed is reduced to 205 from 724, and in the Wash and North Norfolk Coast SAC the number of harbour seals disturbed is reduced to 8 from 154. For the Southern North Sea SAC, when assuming an EDR of 15 km for mitigated WTG piling at a single location at the Project, the maximum contribution of the Project to the daily spatial 20% threshold of the Southern North Sea SAC reduces from 6.04% to 2.6%. This significantly reduces the contribution of the Project to the disturbance thresholds.

Natural England also requested that the NAS commitment be amended to remove 'unless otherwise agreed with the Marine Management Organisation (MMO)'. Following this feedback the commitment was updated to:

"The Applicant has committed to deploy primary and/or secondary noise reduction methods (Noise Abatement Systems) for pile driving."

To secure the updated commitment the Applicant has updated the Outline MMMP for Piling Activities, In-Principle Southern North Sea Site Integrity Plan and Draft DCO.

Additionally, the Applicant has updated condition 13(f), Schedule 10, 11, and condition 11(e) of Schedule 12, 13,14 and 15 of the draft DCO for submission (3.1) to reflect Natural England's concerns regarding the inclusion of 'include consideration of deployment' and it now states:

"The marine mammal mitigation protocol must include deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling

activities. The marine mammal mitigation protocol must include full details and justification for the mitigation chosen or excluded for deployment."

The Applicant considers that Natural England's concerns have been addressed within this updated note and that the commitment to NAS and modelling provided resolves the outstanding issues.

1 Introduction

1. GT R4 Limited (trading as Outer Dowsing Offshore Wind), hereafter referred to as the 'Applicant', is proposing to develop Outer Dowing Offshore Windfarm, hereafter referred to as 'the Project'. The Applicant submitted an application for a Development Consent Order (DCO) ('the Application') for the Project to the Planning Inspectorate in March 2024, which was accepted for Examination in April 2024. The Examination ran from 10 October 2024 to the 10 April 2025.
2. This note has been prepared to address comments from Natural England in their formal statutory response to the Outer Dowsing Offshore Windfarm (ODOW) Examination Deadline 6 on the topic of Marine Mammals (REP6-148), specifically with regard to the Applicant's commitment regarding Noise Abatement Systems (NAS).
3. At the final Deadline (Deadline 6) of examination, Natural England had concerns remaining around the Applicant's wording of the commitment for NAS and noise reduction technologies. In Appendix E4 Natural England's Advice on Marine Mammals (REP6-148) and Natural England's Risk and Issue Log (REP6-153 rows 3, 15 and 18 of Tab E Marine Mammals) there were a number of concerns that Natural England stated would be resolved if the Applicant were to commit to noise abatement or noise reducing technology.
4. The Applicant at Deadline 6 updated the commitment to the use of NAS and noise reduction technologies; accordingly, this note is to provide clarity on the update and additional information regarding the commitment and Project position.
5. The Applicant considers that the updated NAS commitment resolves the following issues, and wishes to reach agreement with Natural England on these points:
    - The conclusion of no Adverse Effect on Integrity (AEoI) on the:
        - Harbour porpoise (*Phocoena phocoena*) feature of the Southern North Sea Special Area of Conservation (SAC), from underwater noise disturbance resulting from the project in-combination with other activities;
        - Harbour seal (*Phoca vitulina*) feature of the Wash and North Norfolk Coast SAC, from underwater noise impacts from piling from the project alone and in-combination with other activities; and
        - Grey seal (*Halichoerus grypus*) feature of the Humber Estuary SAC and Ramsar site, from underwater noise impacts in combination with other projects.
    - There are no outstanding concerns on the updated wording of the commitment within the In-Principle Southern North Sea Special Area of Conservation Site Integrity Plan (document reference 8.7 (REP6-068)) and the Outline Marine Mammal Mitigation Protocol for Piling Activities (document reference 8.6.1 (REP6-064)).

2 Commitment to Noise Reduction Methods

6. The Department for Environment, Food and Rural Affairs (Defra) Policy Paper on Reducing Marine Noise was published on the 21 January 2025 as part of Defra's Marine Noise Package. Also, as part of this package, the Statutory Nature Conservation Bodies (SNCBs) published their Position on the Use of Quieter Piling Methods and Nosie Abatement Systems (JNCC et al., 2025), which is applicable to English waters.
7. The Defra (2025) policy states:

> *"From January 2025, given the expected increase in noise levels over the coming years, and the above outlined policy commitments, we expect that all offshore wind pile driving activity across all English waters will be required to demonstrate that they have utilised best endeavours to deliver noise reductions through the use of primary and/or secondary noise reduction methods in the first instance."*

8. Following the release of the Defra (2025) policy, the Applicant developed a commitment for the Project that was in line with the policy wording. At Deadline 4, the Applicant committed to:

> *"use best endeavours to deliver noise reductions through the use of primary and/or secondary noise reduction methods."*

9. This commitment was secured through the submission of the updated Outline Marine Mammal Mitigation Protocol (MMMP) for Piling Activities (REP4-084) (secured under condition 13(f), Part 2 of Schedule 10, 11 of the DCO and Condition 11(e), Part 2 of Schedules 12, 13, 14, and 15 of the DCO) and In-Principle Site Integrity Plan (SIP) (REP4-086) (secured under Condition 22, Part 2 of Schedules 10 and 11 of the DCO and Condition 15, Part 2 of Schedules 12, 13, 14 and 15 of the DCO).
10. Following a request for clarification from the Examining Authority during Issue Specific Hearing 6, the Applicant submitted a note entitled 'Clarification Note: Use of 'best endeavours' in the context of Policy Paper Reducing Marine Noise' (REP4a-118) to provide understanding of the legal obligations of 'best endeavours'. The term 'best endeavours' has a particular meaning in the context of contractual interpretation, and requires the obligor to take such steps that, in the relevant circumstances, a reasonable party would take seeking to achieve the result including if it is required to incur costs to do so.
11. Following further consultation, Natural England provided advice in relation to Principal Areas of Disagreement Statement Summaries (PADSS) items NE8 and NE9, and Point 3 of Appendix J5 Natural England Risk and Issues Log Deadline 5 (REP5-171):

> *"The Applicant should make commitment to using NAS as mitigation. Natural England does not accept the term 'Best endeavours' as a form of commitment'.*

12. It is the Applicant's interpretation that this request from Natural England was for a stronger commitment than that achieved through aligning with the wording of the Defra (2025) policy alone.

13. The Report to Inform Appropriate Assessment (RIAA) (REP6-028) concluded no AEoI for underwater noise impacts on the Wash and North Norfolk Coast SAC, the Humber Estuary SAC and the Southern North Sea SAC. In Appendix J5 Natural England Risk and Issues Log Deadline 5 (REP5-171) and Appendix E4 Natural England's Advice on Marine Mammals (REP6-148), several points were raised by Natural England regarding the impact in-combination on those sites.
14. At Deadline 6, the Applicant updated the commitment secured within the Outline MMMP for Piling activities (REP6-064) (secured under Condition 13(f), Part 2 of Schedules 10 and 11 of the DCO, and Condition 11(e), Part 2 of Schedules 12, 13, 14, and 15 of the DCO) and the In-Principle SIP (REP6-068) (secured under Condition 22, Part 2 of Schedules 10 and 11, of the DCO, and Condition 15, Part 2 of Schedules 12, 13, 14, and 15 of the DCO) to state:

> *"The Applicant will deploy primary and/or secondary noise reduction methods (Noise Abatement Systems) for pile driving, unless otherwise agreed with the Marine Management Organisation (MMO)."*

15. Additionally, the Applicant updated condition 13(f), Schedule 10, 11, and condition 11(e) of Schedule 12, 13,14 and 15 of the draft DCO (REP6-008) at Deadline 6 to state:

> *"The marine mammal mitigation protocol must include consideration of deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling activities. The marine mammal mitigation protocol must include full details and justification for the mitigation chosen or excluded for deployment."*

16. Due to the updated NAS commitment and DCO condition being made at Deadline 6 no feedback was able to be received, so to allow further discussion the Applicant and Natural England held a meeting on 9th June 2025. Natural England welcomed the removal of 'best endeavours' but had concerns remaining. Following this feedback, the commitment was amended and secured in update versions of the Outline MMMP for Piling Activities (document reference 8.6.1) and In-Principle Site Integrity Plan (document reference 8.7) that were submitted in the response to the Request for Information dated 12th August. The updated commitment stated:

> *"The Applicant has committed to deploy primary and/or secondary noise reduction methods (Noise Abatement Systems) for pile driving."*

17. Additionally, the Applicant has updated condition 13(f), Schedule 10, 11, and condition 11(e) of Schedule 12, 13,14 and 15 of the draft DCO for submission (document reference 3.1, submitted in the response to the Request for Information dated 12th August) to reflect Natural England's concerns regarding the inclusion of 'include consideration of deployment' and it now states:

> *"The marine mammal mitigation protocol must include deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling activities. The marine mammal mitigation protocol must include full details and justification for the mitigation chosen or excluded for deployment."*

18. The Applicant considers the commitment it has made is above and beyond what is required by the Defra (2025) 'best endeavours' policy, now committing that the Applicant will deploy primary and/or secondary noise reduction methods for pile driving. The Applicant highlights this commitment goes beyond the commitments currently made on other projects including Five Estuaries (GoBe, 2025), North Falls (Royal Haskoning, 2025a), and Dogger Bank South (Royal Haskoning, 2025b).
19. The Applicant cannot commit to any specific primary and/or secondary noise reduction measures until design parameters are finalised post-consent as there is the need to first complete ground investigations and select appropriate vessels, as detailed during the Examination in the Applicant's Written Summary of Oral Case Put at the Issue Specific Hearing 6 (REP4a-117) and the Applicant's Comments on Deadline 5 Submissions (REP6-110). Whilst the process to refine design parameters and gather additional information will continue into the post-consent phase, the Applicant has undertaken initial engagement with noise reduction method suppliers, as detailed in the Applicant's Comments on Deadline 4 Submissions (REP4a-115), who have given the Applicant confidence about sourcing NAS and relevant lead in times. This approach aligns with Natural England's response in their Deadline 6 submission Appendix E4 Natural England's Advice on Marine Mammals (REP6-148), stating:

    "Natural England has not requested that the Applicant commit to a specific mitigation system or technology at this point, nor do we advocate for or recommend any particular system, technology or methodology."

20. As no commitment to a specific measure can be made at this stage in the development process, this Technical Note provides noise reduction information of various primary and secondary mitigation measures for illustrative purposes only to demonstrate the range of noise reductions the Applicant is potentially able to achieve. The Applicant will provide a final MMMP for Piling Activity and final SIP in the post-consent phase, closer to the time of pile driving. These will incorporate the final Project design and the confirmation of primary and/or secondary measures to be deployed. The commitment to mitigation measures (primary and/or secondary) will be agreed by the MMO in consultation with the Natural England. The relevant final MMMPs (secured in Condition 13(1)(f), Part 2, Schedules 10 and 11 and Condition 11(1)(e), Part 2, Schedules 12, 13, 14 and 15 of the DCO) and final SIP (secured in DCO Schedule 10, 11, Part 2 - Condition 22 and DCO Schedule 12, 13, 14 and 15, Part 2 – Condition 15) will need to be approved by the MMO prior to any offshore piling works commencing .
21. It is expected that a European Protected Species (EPS) licence will be required for the piling works; this too will be subject to approval by the MMO in consultation with Natural England. The EPS licensing process also provides another route through which mitigation such as NAS requires robust consideration, as detailed below.
22. The three tests an EPS licence application needs to pass in order to be granted are:
    - the activity must be for a certain purpose;
    - there must be no satisfactory alternative that will cause less harm to the species;

- the activity must not harm the long-term conservation status of the species.

23. The Defra (2025) policy states:

> *"a wildlife licence may also be required to undertake piling and may only be granted where the licensing authority is content that it meets the legislative tests: for example, where there is no satisfactory alternative and the activities licensed are not detrimental to the maintenance of the population of the species concerned, at a favourable conservation status in their natural range."*

24. The Applicant understands that going forward there is an expectation that noise reduction measures will have to be robustly considered, in order to pass the satisfactory alternatives test and be awarded an EPS licence for piling activities. The Applicant considers that by having committed to deploying primary and/or secondary noise reduction methods, there is a greatly reduced risk of the second test not being met.

25. In summary, the Applicant highlights that multiple relevant conditions and controls are in place to ensure robust and appropriate final mitigation will be deployed for the Project.

3 Potential Noise Reduction Achieved through Noise Reduction Methods

26. Given that the Applicant cannot commit to any specific primary and/or secondary noise reduction measures at this stage of the development process, the potential noise reduction (in decibels, dB) of various primary and secondary measures has been reviewed and presented.

3.1 Primary noise reduction methods

27. Primary noise mitigation strategies focus on minimising noise generation directly at the source. This can be accomplished by altering the piling process—for example, by adjusting the project design, maximum hammer energy or blow rate. Additionally, alternative hammer systems such as hammer noise reduction add-ons, vibratory hammers or IQIP EQ piling technology could be employed (Table 3-1), or, where feasible to do so, inherently quieter foundation types could be used, such as suction buckets, gravity-based structures, and drilled foundations (Table 3-2). These measures would produce noise reductions or quieter noise emissions when compared to unabated impact pile driving.

Table 3-1 Potential noise reduction ranges from primary noise reduction methods

Primary measure	Noise reduction (dB)	Source
IQIP EQ Piling technology[1] (previously BLUE piling technology) (water depth 22.4 m)	19-24 (SEL)	Koschinski and Lüdemann (2020)
Vibropiling (water depth <25 m)	10-20 (Leq, 30s)[2]	
PULSE	4-6 (SEL)	
MENCK Noise Reduction Unit[3] (MNRU)	9-11 (SEL)	

Table 3-2 Noise emissions from alternative foundations (also defined as a primary noise reduction measure as per Defra (2025))

Primary measure	Noise emission	Source
Gravity based foundation	No specific sound measurements available	Koschinski and Lüdemann (2020)

[1] Please note the noise reduction values for this technology are from a test performed in nearshore waters on a pile with 6.5 m diameter that was not driven but fixed to the seabed.

[2] The presented noise reduction is in comparison to mitigated impact pile driving at identical monopiles, noting that these were smaller monopiles than proposed for the Project. The reduction compared to unmitigated impact pile driving, at larger monopiles, is unknown. However, it should also be noted that it is highly unlikely that vibropiling alone could be used to complete the pile installation campaign; vibropiling would almost certainly be used alongside an impact hammer.

[3] Please note, due this technology being new to the market, there is currently limited experimental data for it. The value has been provided by the equipment supplier and is based on numerical modelling.

Primary measure	Noise emission	Source
Suction bucket jacket	Sound pressure level (Leq50) at 750m did not differ from background noise (137 dB)	
Mono bucket foundation	Sound emissions from the electric suction pumps are generally lower than the measurable background noise	

3.2 Secondary noise reduction

28. Secondary noise mitigation techniques are designed to reduce the transmission of noise propagated through the water column during impact pile driving. This can be achieved through the use of NAS, including pile casing systems or bubble curtains (Table 3-3) The values provided below have been achieved when mitigation measures have been implemented without hammer noise reduction add-ons.

Table 3-3 Indicative minimum and maximum noise reduction from secondary noise reduction methods

Secondary measure	Noise reduction SEL (dB)	Source
Bubble curtains (Big Bubble Curtains (BBC) and Double Big Bubble Curtains (DBBC))		
BBC (>0.3 m^3/min*m) (water depth <25 m)	11-15	Bellmann et al., (2020)
BBC (>0.3 m^3/min*m) (water depth ~30 m)	8-14	
BBC (>0.3 m^3/min*m) (water depth ~40 m)	7-11	
Double Bubble Curtains (DBBC) (>0.3 m^3/min*m) (water depth <25 m)	14-18	
DBBC (>0.3 m^3/min*m) (water depth ~40 m)	8-13	
DBBC (>0.4 m^3/min*m) (water depth ~40 m)	12-18	
DBBC (>0.5 m^3/min*m) (water depth >40 m)	~15-16 (based on one pile)	
Hydro sound Dampers (HSD)		
OffNoise Solutions GmbH HSD	10-12	Bellmann et al., (2020)
Pile casing systems		
IHC IQIP Noise Mitigation System (NMS)	13-17	Bellmann et al., (2020)
IHC-NMS 8000	15-17	
Combination of systems		
IHC-NMS + BBC (>0.3 m^3/min*m) (water depth <25 m)	17-23	Bellmann et al., (2020)

Secondary measure	Noise reduction SEL (dB)	Source
HSD + BBC (>0.4 m^3/min*m) (water depth ~30 m)	15-20	
HSD + DBBC (>0.5 m^3/min*m)	18-19	
AdBm NMS + BBC (>0.4 m^3/min*m, water depth 19-27 m)	12-15	Barber et al., (2025)
AdBm NMS + DBBC (water depth 16-30 m)[4]	12-25	

[4] Deployed commercially at Borssele 3 and 4 offshore wind farms

4 Benefits of Noise Reduction in EIA terms

29. Exposure to loud sounds can lead to a reduction in hearing sensitivity (a shift in hearing threshold), which is generally restricted to particular frequencies. This threshold shift results from physical injury to the auditory system and may be permanent (Permanent Threshold Shift or PTS), in which case it is treated as an injury in assessments under EIA Regulations (and EPS assessments). Chapter 11 Marine Mammals (REP6-021) presented an assessment of the ranges over which PTS could occur in marine mammal receptors, presented for both instantaneous PTS (SPL_{peak}) and cumulative PTS (SEL_{cum}).
30. The assessment in Chapter 11 Marine Mammals was undertaken for unmitigated pile driving scenarios at three locations within the Array Area (NW, SW, NE), the Offshore Reactive Compensation Platform (ORCP) and two Artificial Nesting Structures (ANS) locations (NW, SE), for both monopile and jacket foundations. This section presents an illustration of likely predicted instantaneous PTS impact ranges from mitigated piling of a single monopile at the NE location, the worst-case for noise propagation, based on an assumed 10 dB reduction in noise levels. Section 5 addresses the impact mitigated monopiling in HRA terms. A flat 10 dB reduction has been routinely assumed as the minimum dB reduction representative of the majority of noise reduction systems (e.g. by Bellman et al., 2020) for similar assessments for offshore wind projects. The mitigated impact ranges have then been compared to the unmitigated impact ranges for the same modelling location, as presented in Chapter 11 Marine Mammals (REP6-021).

4.1 Reduction in PTS-onset ranges (SPL_{peak})

31. Table 4-1 presents the predicted PTS-onset ranges using SPL_{peak} for a single strike at the maximum hammer energy in the current design envelope of 6,600 kJ for monopile installation (both unmitigated and mitigated). The predicted impact range for harbour porpoise (the most sensitive receptor with the largest impact ranges) would be 130 m (mitigated), which is a notable decrease from the 580 m (unmitigated) presented in Table 11-25 of Chapter 11 Marine Mammals (REP6-021).

Table 4-1 Predicted PTS-onset impact ranges (SPL_{peak}) at the worst-case NE modelling location for unmitigated and mitigated monopiles

Species	NE Monopile Location	
	Unmitigated ES PTS-onset impact range (m)	PTS-onset impact range with 10dB reduction (m)
Harbour porpoise	580	130
White-beaked dolphin	<50	<50
Bottlenose dolphin	<50	<50
Minke whale	<50	<50

Species	NE Monopile Location	
Harbour seal	<50	<50
Grey seal	<50	<50

4.2 PTS-onset ranges (SEL_{cum})

32. Table 4-2 presents the predicted PTS-onset ranges using SEL_{cum} for monopile installation (both unmitigated and mitigated) up to the maximum hammer energy in the current design envelope of 6,600 kJ. The predicted impact range for harbour porpoise and minke whale (the most sensitive receptors with the largest impact ranges) would be < 100 m (mitigated), which is a significant decrease from the 2,000 m and 5,000 m (unmitigated) presented in Table 11-26 and Table 11-33 of Chapter 11 Marine Mammals (REP6-021).

Table 4-2 Predicted PTS-onset impact ranges (SEL_{cum}) at the worst-case NE modelling location for unmitigated and mitigated monopiles

Species	NE Monopile Location	
	Unmitigated ES PTS-onset impact range (m)	PTS-onset impact range with 10dB reduction (m)
Harbour porpoise	2,000	<100
White-beaked dolphin	<100	<100
Bottlenose dolphin	<100	<100
Minke whale	5,000	<100
Harbour seal	<100	<100
Grey seal	<100	<100

4.3 Mitigation implications

33. The Applicant considers that Table 4-1 and Table 4-2 should provide reassurance to Natural England that mitigated piling leads to small PTS ranges for all marine mammal receptors, in relation to Point 3 in Tab E Marine Mammals of Appendix J6 Natural England's Risk and Issue Log Deadline 6 (REP6-153). The maximum predicted PTS-onset range for mitigated monopile installation is 130 m, which is readily mitigatable using industry standard measures (ADD, marine mammal observer, passive acoustic monitoring).

With the decrease in impact ranges due to the implementation of NAS, the ADD activation time would be reduced when compared with unmitigated piling impact ranges. To illustrate, the unmitigated piling scenarios in the ES would have necessitated a minimum 26 minutes of ADD activation (based on the time it takes an animal to flee the PTS-onset range, using standard fleeing speeds), whereas in the mitigated piling scenario the ADD would only need to be activated for 2 minutes. Alternatively, it could be considered that these small PTS-onset ranges are mitigatable through monitoring of the standard 500 m mitigation zone alone, and an ADD is not required. It is noted that final noise modelling undertaken to support the post-consent piling MMMP will determine the final mitigation measures such as ADD durations and size of the mitigation zone.

5 Benefits of Noise Reduction in HRA terms

34. This Section details the benefits noise reduction has in HRA terms based on the Natural England letter received 11th July 2025 which requested this note was updated to provide additional evidence to support the impact a reduction in underwater noise would have on the harbour porpoise feature of the southern North Sea SAC, the grey seal feature of the Humber Estuary SAC and the harbour seal feature of the Wash and North Norfolk Coast SAC.

5.1 Southern North Sea SAC

5.1.1 Project alone

35. In Appendix J6 Natural England's Risk and Issue Log Deadline 6 (REP6-153) Point 18 in Tab E Marine Mammals and Appendix E4 Natural England's Advice on Marine Mammals (REP6-148), Natural England stated they did not agree with the Applicant's conclusion of no Adverse Effect on Integrity (AEoI) for the Southern North Sea SAC and advised that the Applicant should commit to mitigation measures such as NAS.
36. At Deadline 6, the Applicant updated the wording of the commitment in line with Natural England's advice to deploy primary and/or secondary noise reduction methods within the In-Principle Site Integrity Plan (SIP) (REP6-068), secured under Condition 22, Part 2 of Schedules 10 and 11 of the DCO and Condition 15, Part 2 of Schedules 12, 13, 14, and 15 of the DCO.
37. Additionally, the Applicant, following post examination discussions with Natural England on 9th June 2025, updated dML Condition 13(f) of Schedules 10 and 11, and Condition 11(e) of Schedules 12, 13, 14, and 15 of the draft DCO (3.1) to state:

> *"The marine mammal mitigation protocol must include deployment of noise mitigation systems or noise abatement systems that will be utilised to manage sounds from those piling activities. The marine mammal mitigation protocol must include full details and justification for the mitigation chosen or excluded for deployment."*

38. Whilst the above commitment relates to the MMMP, it is relevant to all assessments as it secures the commitment to NAS, which will apply to the Project as a whole.
39. The Applicant acknowledges that Natural England did not see these updated documents within the timeframe of Examination. The Applicant considers that, with the updated commitment, Points 3, 15 and 18 in Appendix J6 Natural England's Risk and Issue Log Deadline 6 (REP6-153) are now resolved.
40. To support this position, Figure 1 presents the predicted sound exposure levels (SEL) contours for a single monopile installation at the NE modelled location, overlaid with the Southern North Sea SAC. The NE modelled location is considered the worst case as it results in the greatest overlap with the Southern North Sea. The figure compares unmitigated and mitigated scenarios, with the mitigated scenario assuming a 10 dB reduction in source levels. Under the mitigated scenario, there is a marked reduction in the spatial extent of SEL disturbance contours, indicating that a smaller area of the SAC would be exposed to elevated noise levels.

41. This reduction in the predicted extent of noise exposure highlights the benefit of NAS in reducing the area of the SAC subjected to elevated sound levels, and would also lead to a reduction in the number of harbour porpoise predicted to be disturbed, thereby reducing the Project's contribution to cumulative disturbance of harbour porpoise. The noise contours presented in Figure 1 therefore supports the Applicant's position that the use of NAS would minimise the risk of disturbance to harbour porpoise, reinforcing the conclusion of no AEoI from Project alone on the Southern North Sea SAC.

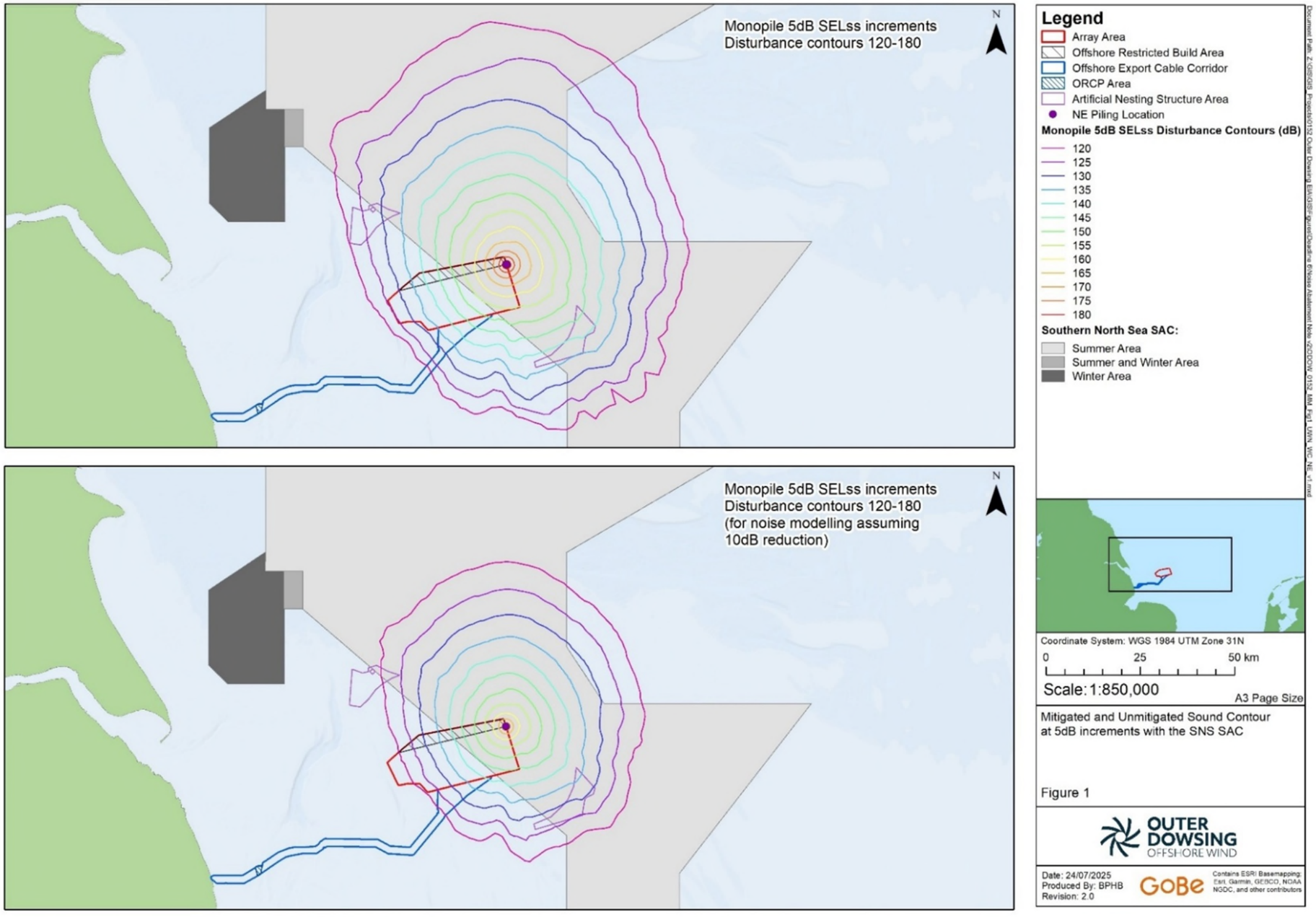

Figure 1 Predicted SEL contours at 5 dB increments for a single monopile installation, with and without NAS, in relation to the Southern North Sea SAC

42. The assessment presented in Table 10-3 in the RIAA (REP6-028) assumes an Effective Deterrent Range (EDR; the distance over which harbour porpoise are assumed to be disturbed) of 26 km for unmitigated piling at all projects (JNCC, 2020). Given the Project's commitment to NAS, it is considered that this EDR is no longer applicable; it would be more appropriate to assume an EDR of less than 26 km as a result of reduced noise emissions from the use of such measures.
43. JNCC (2020) states that an EDR of 15 km is appropriate for piling activities using a Big Bubble Curtain (BBC), and it is anticipated that the majority of NAS technology options for the Project will achieve a noise reduction that is similar or greater than BBC. The application of a 15 km EDR to the Project's single piling scenario would reduce the project-alone impact area by approximately 66%, from 2,122 km^2 (unmitigated) to 706 km^2 (mitigated), therefore significantly reducing the contribution of the Project to the disturbance thresholds in the SAC.
44. Figure 2 illustrates this reduction in EDR, comparing the unmitigated 26 km range with the mitigated 15 km range at the NE modelled location. This figure visually demonstrates the significant reduction in the area of the Southern North Sea SAC over which harbour porpoise would be disturbed with the application of NAS, reinforcing the conclusion of no AEoI from Project alone on the Southern North Sea SAC.
45. Given the recent Defra (2025) policy, there is an expectation that most, if not all, offshore wind farm projects will require some form of noise reduction. As a result, an EDR of less than 26 km would also apply to other projects considered in the in-combination assessment. If most projects included in Table 10-3 in the RIAA (REP6-028) were to commit to a noise reduction measure as a result of Defra (2025) policy, the contribution of the Project in-combination with other plans and projects to the disturbance thresholds in the SAC would be greatly reduced.
46. The Applicant will provide a final SIP in the post-consent phase, closer to the time of piling. This final SIP will include the commitments of the Project, and other projects and activities due to occur at the same time in the vicinity of the SAC, to mitigation measures such as NAS. It will provide an updated project alone and in-combination assessment, to demonstrate that the SAC thresholds for significant disturbance will not be exceeded.
47. Linked to the SIP process, the Applicant has already begun actively exploring collaboration agreements with other developers that may be undertaking piling at the same time as the Project. In doing so, the Project aims to share relevant information as early as possible, to aid coordination and management of noisy activities. This engagement with other developers will continue through the development of the SIP.
48. In addition, engagement will be undertaken with other relevant developers and operators in the SNS through industry groups such as the Southern North Sea Offshore Wind Forum (SNSOWF) and its Underwater Noise Forum subgroup. Through the SNSOWF, the Applicant will coordinate with others to share information on each project's schedules and contribution to the disturbance thresholds, to encourage consistent assessments and identify pinch-points that can be addressed through coordination, thereby preventing exceedances of the SAC disturbance thresholds.

49. The engagement and coordination undertaken by the Applicant will be reflected in the final Southern North Sea SAC SIP submitted to the MMO. The Applicant highlights that the final SIP must be agreed by the MMO before piling commences (dML Condition 22 of Schedules 10 and 11, and Condition 15 of Schedules 12, 13, 14, and 15 of the draft DCO (3.1)), and that the MMO would not agree to a piling SIP if the SAC disturbance threshold was going to be breached through the proposed piling activity.

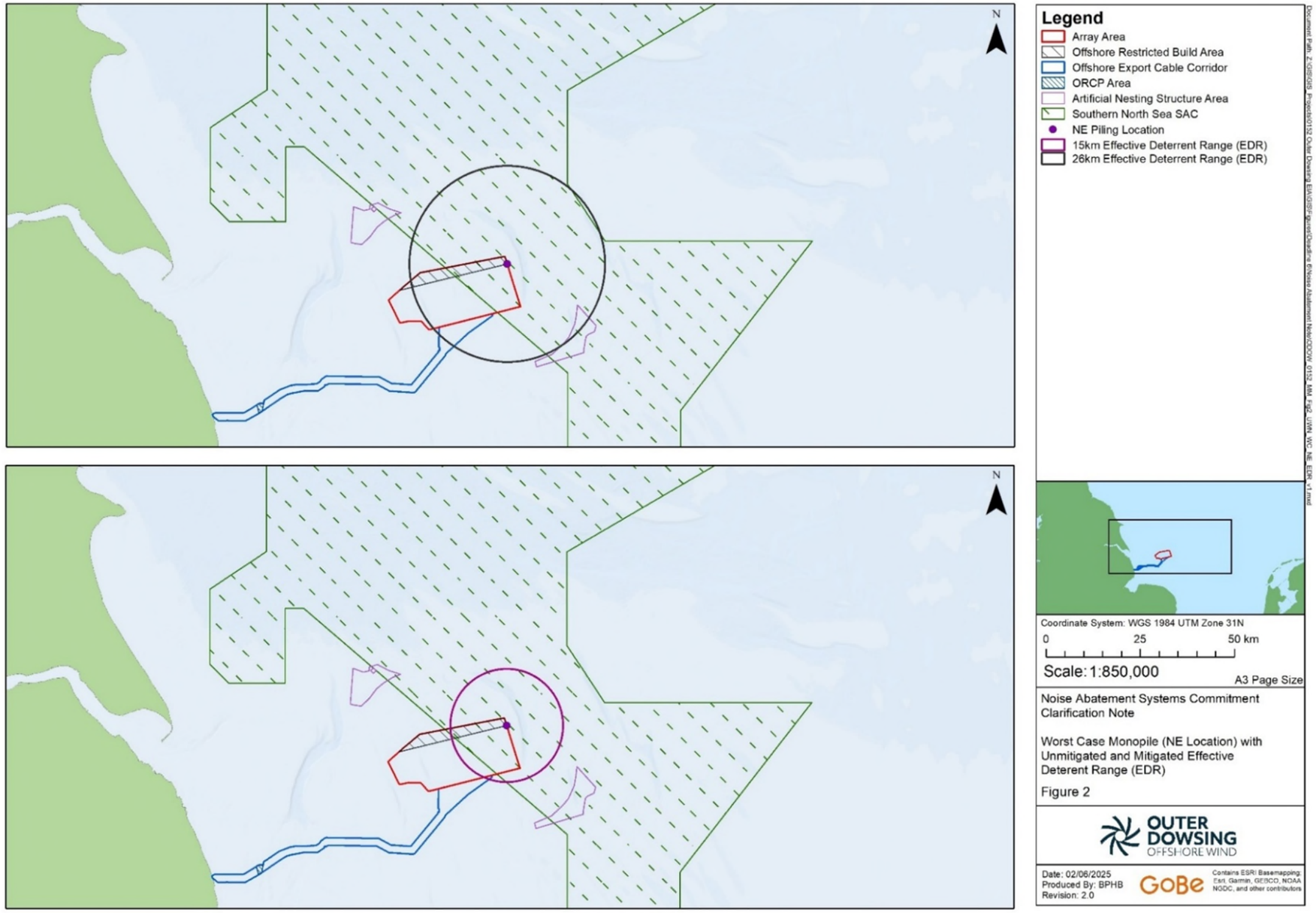

Figure 2 Comparison of EDRs for a single monopile installation, with and without NAS, in relation to the Southern North Sea SAC

5.1.2 In-combination

50. In Natural England's letter dated 11th July 2025, Natural England advised that further evidence would be required to demonstrate there will be no AEoI on the harbour porpoise features of the Southern North Sea SAC and to show that the overall cumulative impact is reduced.
51. When assuming an EDR of 15 km for mitigated WTG piling at a single location at the Project, whether through the use of BBC or the use of another primary and/or secondary measure, the maximum contribution of the Project to the daily spatial 20% threshold of the Southern North Sea SAC reduces from 6.04% (Table 10-3 of Report to Inform Appropriate Assessment (REP6-030)) to 2.6% (Table 5-1). This significantly reduces the contribution of the Project to the disturbance thresholds.
52. Table 5-1 shows an overall reduction in the maximum in-combination spatial contribution to the disturbance thresholds when compared to Table 10-3 of Report to Inform Appropriate Assessment (REP6-030)). The Project acknowledge that other projects included within Table 5-1 have either already committed to or will be required to commit to the Defra (2025) policy, however, given that none of the projects have committed to a specific measure, it has been assumed that they will be undertaking unmitigated piling. As a result, Table 5-1 is very much intended to represent an unmitigated and precautionary worst case scenario and does not take account of any overlap between individual activities associated with individual projects – which would occur in the unlikely event that all such activity occurred in the same day. Once such double counting is considered, the remaining potential for overlap (based on each project piling at the worst possible location for each project and assuming an unrealistic build out) would be reduced.
53. Furthermore, the timeframe of projects means that such a risk on a day-by-day basis would not actually materialise, with the maximum values even less likely to occur (as this requires simultaneous works at all projects at the worst location). With uncertainty in pile schedule and build out of projects, it is hard to assess this however, typical reductions are in the order of approximately 15-25% based on previous years. Additionally, the Project is a member of the SNSOWF developer group which actively works together to share information and coordinate activities to prevent exceedances of the daily spatial threshold.
54. The final SIP for Piling will be produced through coordination with the SNSOWF group and direct engagement with other offshore wind farm developers to ensure the spatial threshold is adhered to. Further detail on how the SIP will manage adherence to the threshold is detailed in Paragraphs 1639-1645 within the Report to Inform Appropriate Assessment (REP6-030).

Table 5-1 Spatial effect in-combination from a single location in a single day in summer season

Project	Summer 26	Summer 27	Summer 28	Summer 29	Relevant activity
The Project					
Maximum km^2	706	706	706	706	Mitigated ANS single location piling 2026 Mitigated WTG single location piling Q2 2027-Q2 2029
Maximum %	2.6	2.6	2.6	2.6	
The Project and Tier 1-4 Projects					
Maximum km^2	6756	7890	7865	7865	Mitigated ANS single location piling 2026 at the Project Mitigated WTG single location piling Q2 2027-Q2 2029 at the Project In-combination Projects (unmitigated single location): ▪ Dogger Bank C ▪ Norfolk Boreas ▪ East Anglia One North ▪ East Anglia Two ▪ Hornsea Four ▪ Hornsea Three ▪ Dudgeon Extension ▪ Dogger Bank South (West) ▪ Dogger Bank South (East)
Maximum %	24	29	29	29	

55. When assuming an EDR of 15 km for mitigated WTG piling at a single location at the Project, whether through the use of BBC or the use of another primary and/or secondary measure, the maximum contribution of the Project to the seasonal temporal 10% threshold of the Southern North Sea SAC reduces from 1.08% (Table 10-5 of Report to Inform Appropriate Assessment (REP6-030)) to 0.66% (Table 5-2). This significantly reduces the contribution of the Project to the disturbance thresholds.

56. Table 5-2 shows the project's reduced contribution to the in-combination temporal disturbance thresholds when compared to Table 10-5 of Report to Inform Appropriate Assessment (REP6-030). Table 5-2 is intended to represent a precautionary worst-case scenario as unmitigated piling has been assumed for all other projects.

Table 5-2 Summary of risk to the 10% threshold in-combination piling within a summer season

Project	Activities per summer season	Average area (km2) overlap per day	Average % overlap per summer season
The Project	100 days of piling	327	0.66
Dogger Bank C	183 days of piling	13	0.05
East Anglia One North	183 days of piling	742	2.75
East Anglia Two	183 days of piling	90	0.33
Hornsea 3	111 days of piling	216	0.48
Hornsea 4	183 days of piling	2026	7.51
Norfolk Boreas	54 days of piling	1246	1.36
Dudgeon Extension	32 days of piling	178	0.12
Dogger Bank South (West)	51 days of piling[5]	571	2.11
Dogger Bank South (East)	51 days of piling[5]	571	2.11

57. The temporal assessment is precautionary and results in an overestimate, for several reasons:

- For a number of projects, no total piling days exist, and a precautionary assumption has been made;
- Several of the projects have a very large construction window and are highly likely to progress to construction well before 2027, therefore it is extremely unlikely that all projects will be in a position to construct within the same summer season;

[5] The values of Dogger Bank South (West) and Dogger Bank South (East) have been changed based on updated project information

- The assessment does not take into account temporal overlap between projects, which is likely to account for approximately 15-25% of the total threshold exceedance on a daily basis;
- The Tiering structure reflects project certainty, with significant uncertainty for most of the projects final scheme design and for all projects final construction window;
- The number of projects included exceeds the number of piling vessels available in the supply chain therefore the level of concurrent piling presented is unlikely to occur; and
- All projects within the in-combination assessment are similarly constrained by the SNS SAC and the requirement for a SIP (as a result of the Review of Consents process or individual project DCO) – which will prevent any project exceeding the thresholds alone and/or in combination.

58. Under the Defra (2025) policy all project's will be required to commit to a mitigation measure. As a result, the EDR associated with each projects activity will be reduced, which will reduce both their spatial and temporal contributions to the thresholds.
59. The final piling SIP will be developed to adhere to the thresholds. It will include confirmation of the relevant project design for the Project alone and include measures for mitigation that would fully address that risk, drawing on the range of mitigation options available. Additionally, it will include an up to date in-combination assessment through coordination with other developers to ensure there is no risk of exceedance of spatial thresholds or temporal thresholds.
60. The Applicant considers that, with the inclusion of the further detail in this Note requested by Natural England, an AEoI on the harbour porpoise feature of the Southern North Sea SAC can be confidently ruled out both from the project alone and in combination.

5.2 The Wash and North Norfolk Coast SAC

5.2.1 Project alone

61. In Appendix E4 Natural England's Advice on Marine Mammals (REP6-148) Natural England stated:

> *"Natural England cannot agree to the conclusion of no AEoI on harbour seals because of the high proportion of animals expected to be disturbed by underwater noise caused by piling from the project in combination with other projects … To reduce the disturbance to harbour seals, the Applicant should commit to noise abatement or noise reducing technology. This commitment would resolve issues associated with harbour seal disturbance from underwater noise caused by piling".*

62. At Deadline 6, the Applicant updated the wording of the commitment in line with Natural England's advice to deploy primary and/or secondary noise reduction methods within the Outline MMMP for Piling Activities (REP6-066) (secured under Condition 13(f), Part 2 of Schedules 10 and 11 of the DCO, and Condition 11(e), Part 2 of Schedules 12, 13, 14, and 15 of the DCO). This commitment is also reflected in the updated dML wording on the face of the DCO at Condition 13(f) of Schedules 10 and 11, and Condition 11(e) of Schedules 12, 13, 14, and 15 of the draft DCO (AS-042) submitted at Deadline 6. The Applicant acknowledges that Natural England did not see these updated documents within the timeframe of Examination. Following discussions post-examination, the Applicant has further updated the commitment and considers this resolves Natural England's concerns.

63. To support this position, Figure 3 presents predicted SEL contours for a single monopile installation at the worst-case location the ORCP, overlaid with harbour seal at-sea density data associated with The Wash and North Norfolk Coast SAC (from Carter *et al.,* 2022). The ORCP location is considered the worst-case location due to proximity to the Wash and North Norfolk SAC and the number of individuals disturbed. The figure compares unmitigated and mitigated scenarios, with the latter assuming a 10 dB reduction in source levels in line with the Applicant's commitment to NAS. Under the unmitigated scenario, the predicted SEL contours cover a larger area, extend closer to the SAC boundary, and overlap with more area of higher harbour seal density. In contrast, the mitigated scenario shows a reduction in the spatial extent of the SEL contours, greater distance from the SAC boundary to the outermost noise contours, and overlap with less area of higher harbour seal density. When the reduced disturbance contours for mitigated piling are considered in the dose-response function, up to 8 harbour seals are predicted to be disturbed, which is a reduction when compared to the unmitigated scenario of 154 individuals presented in Table 11-65 of Chapter 11: Marine Mammals (REP6-020). The reduction in impact would apply to all piling locations within the Project area as a result of reduced area of disturbance when assuming a 10 dB reduction in source levels.

64. In relation to harbour seals associated with the Wash and Norfolk Coast SAC, and to place the population level numbers in context, the JNCC cites the harbour seal population at the Wash as being 7% of the UK total[6], which is given by the JNCC as 48,000-56,000[7]. These numbers would indicate that the Wash population stands at around 3,360-3,920. If all the harbour seals disturbed originate from the Wash, the unmitigated ORCP scenario of 154 individuals would results in between 3.9% and 4.6% of the Wash and North Norfolk Coast SAC population being disturbed. Whereas for the mitigated ORCP scenario, 8 individual seals would be temporarily disturbed, which is between 0.20% and 0.23% of the Wash and North Norfolk Coast SAC population.

[6] https://sac.jncc.gov.uk/site/UK0017075
[7] https://sac.jncc.gov.uk/species/S1365/

65. The reduction in the predicted extent of noise exposure under the mitigated scenario highlights the benefit of NAS in reducing the disturbance impact to the harbour seal feature within and outwith the SAC. The noise contours presented in Figure 3 therefore supports the Applicant's position that the commitment to NAS helps to reduce the risk of disturbance and reinforces the conclusion of no AEoI from the Project alone on The Wash and North Norfolk Coast SAC.

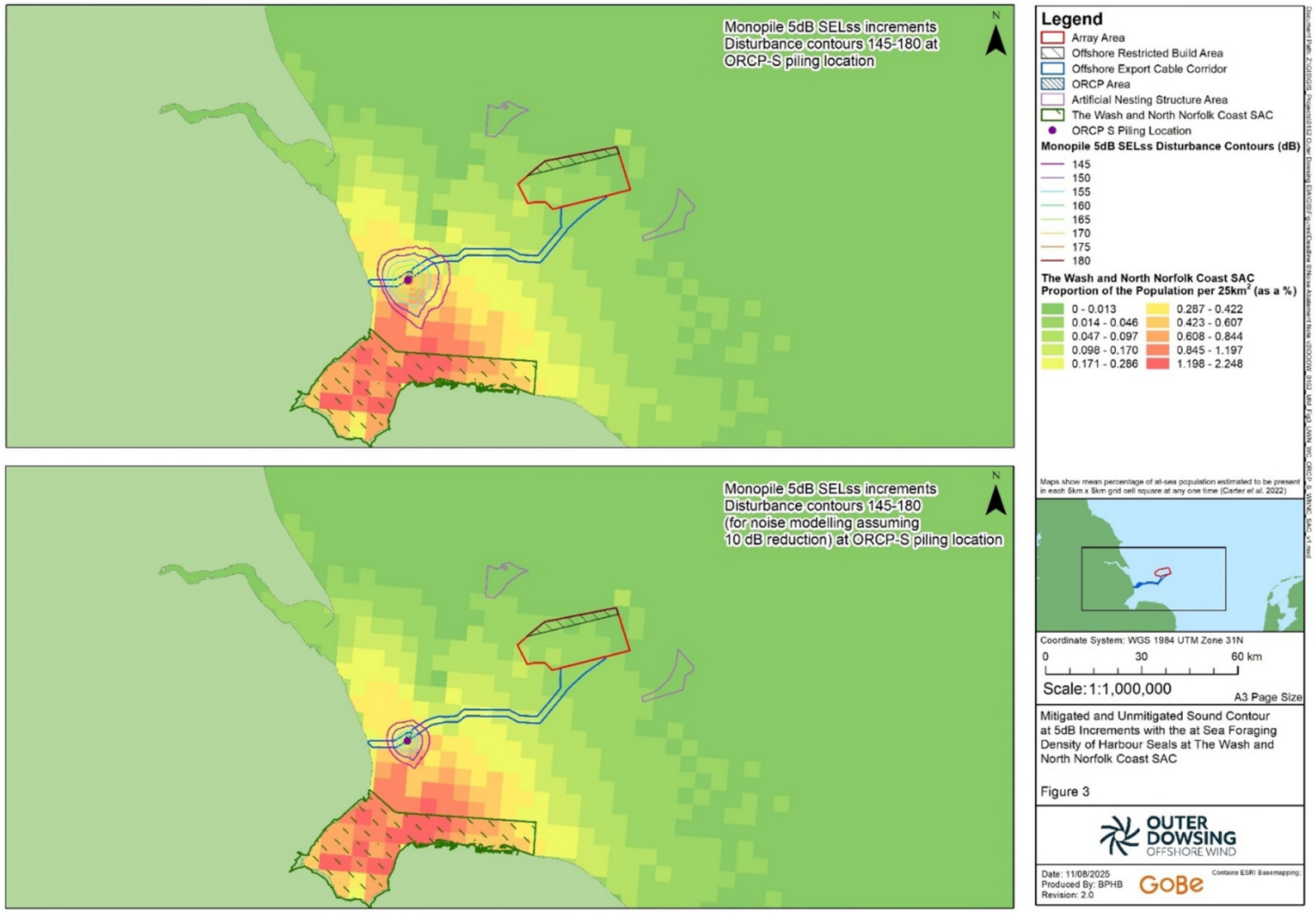

Figure 3 Predicted SEL contours at 5 dB increments for a single monopile installation at ORCP South location, with and without NAS, in relation the Wash and North Norfolk Coast SAC

5.2.2 In-combination

66. In Natural England's letter dated 11th July 2025, Natural England advised that further evidence would be required to demonstrate there will be no AEoI on the harbour seal features of The Wash and North Norfolk Coast SAC and to show that the overall cumulative impact is reduced.
67. As described in paragraph 63 and shown in Figure 3, the number of harbour seals disturbed by the Project would be reduced to 8 individuals when a 10 dB reduction in source levels is assumed for mitigated piling, as a result the number of seals disturbed in-combination would also be reduced. Other projects have either already committed to or will be required to commit to the Defra (2025) policy which would further reduce any in-combination disturbance impact.
68. Hence, the Project maintains there will be no AEoI to the habitat (its structure and function, extent and distribution and the supporting processes on which the habitats depend) together with the population and distribution of the species of harbour seal at the Wash and North Norfolk Coast SAC as a result of the Project and in-combination projects during construction and therefore, subject to natural change, the population and distribution of harbour seal will be maintained in the long-term. The Applicant considers that, with the inclusion of the further detail in this Note requested by Natural England, an AEoI on the harbour seal feature of the Wash and North Norfolk Coast SAC can be confidently ruled out both from the project alone and in combination.

5.3 The Humber Estuary SAC

5.3.1 Project alone

70. In Appendix E4 Natural England's Advice on Marine Mammals (REP6-148) Natural England stated:

> *"Natural England cannot agree to the conclusion of no AEoI on grey seals because of the high proportion of animals expected to be disturbed by the project in combination with other projects from underwater noise … To reduce the disturbance to grey seals, the Applicant should commit to noise abatement or noise reducing technology. This commitment would resolve issues associated with grey seal disturbance."*

71. At Deadline 6, the Applicant formally committed to deploying primary and/or secondary noise reduction methods within the Outline MMMP for Piling Activities (REP6-066) (secured under Condition 13(f), Part 2 of Schedules 10 and 11 of the DCO, and Condition 11(e), Part 2 of Schedules 12, 13, 14, and 15 of the DCO). This commitment is also reflected in the updated dML wording on the face of the DCO at Condition 13(f) of Schedules 10 and 11, and Condition 11(e) of Schedules 12, 13, 14, and 15 of the draft DCO (AS-042) submitted at Deadline 6. The Applicant acknowledges that Natural England did not see these updated documents within the timeframe of Examination. Following discussions post-examination, the Applicant has further updated the commitment and considers this will resolve Natural England's concerns.

72. The Applicant maintains that an AEoI on the grey seal feature of the Humber Estuary SAC can be ruled out. To support this position, Figure 4 presents the predicted SEL contours for a single monopile installation at the worst-case location ANS Northwest and also at the ORCP[8], overlaid with grey seal at-sea density data associated with the Humber Estuary SAC (from Carter *et al.,* 2022). The ANS Northwest location is considered the worst-case location due to the number of individuals disturbed. The figure compares unmitigated and mitigated scenarios, with the latter assuming a 10 dB reduction in source levels, consistent with the Applicant's commitment to NAS. Under the unmitigated scenarios, the predicted SEL contours at both the ANS Northwest and the ORCP location cover a larger area, extend closer to the SAC boundary, and overlap with more area of higher grey seal density. In contrast, the mitigated scenarios show a reduction in the spatial extent of the SEL contours, greater distance from the SAC boundary to the outermost noise contours and overlap with less area of higher grey seal density. When the reduced disturbance contours for mitigated piling are considered in the dose-response function, up to 205 grey seals are predicted to be disturbed at the worst-case ANS Northwest location, which is a reduction when compared to the unmitigated scenario of 724 individuals presented in Table 11-70 of Chapter 11: Marine Mammals (REP6-020). When the reduced disturbance contours for mitigated piling are considered in the dose-response function, up to 52 grey seals are predicted to be disturbed at the ORCP location, which is a reduction when compared to the unmitigated scenario of 193 individuals presented in Table 11-70 of Chapter 11: Marine Mammals (REP6-020).This reduction in numbers disturbed would apply to all piling locations within the Project area as a result of reduced area of disturbance when assuming a 10 dB reduction in source levels.
73. In relation to grey seals associated with the Humber Estuary SAC, and to place the population level numbers in context SCOS (2023) cites the grey seal population for Donna Nook (a close proxy to the Humber Estuary SAC) as being 3,463. However, when factoring in "at-sea" seals (following the scalar presented in SCOS, 2022), the population estimate is 13,769 seals. If all the grey seals disturbed originate from the Humber Estuary SAC, the unmitigated scenario ANS Northwest scenario of 724 individual seals results in 5.3% of the Humber Estuary SAC population being temporarily disturbed. Whereas for the mitigated ANS Northwest scenario of 52 seals disturbed, this results in 0.38% of the Humber Estuary SAC population.
74. The reduction in the predicted extent of noise exposure under the mitigated scenario highlights the benefit of NAS in reducing the disturbance impact to the grey seal feature within and outwith the SAC. The noise contours presented in Figure 4 therefore support the Applicant's position that the commitment to NAS helps to reduce the risk of disturbance and reinforces the conclusion of no AEoI from the Project alone on the Humber Estuary SAC.

[8] ORCP has been presented alongside the worst-case location (ANS Northeast) as it is closer to the Humber Estuary SAC. The ANS Northeast location is considered the worst-case as in terms of the numbers of individuals disturbed.

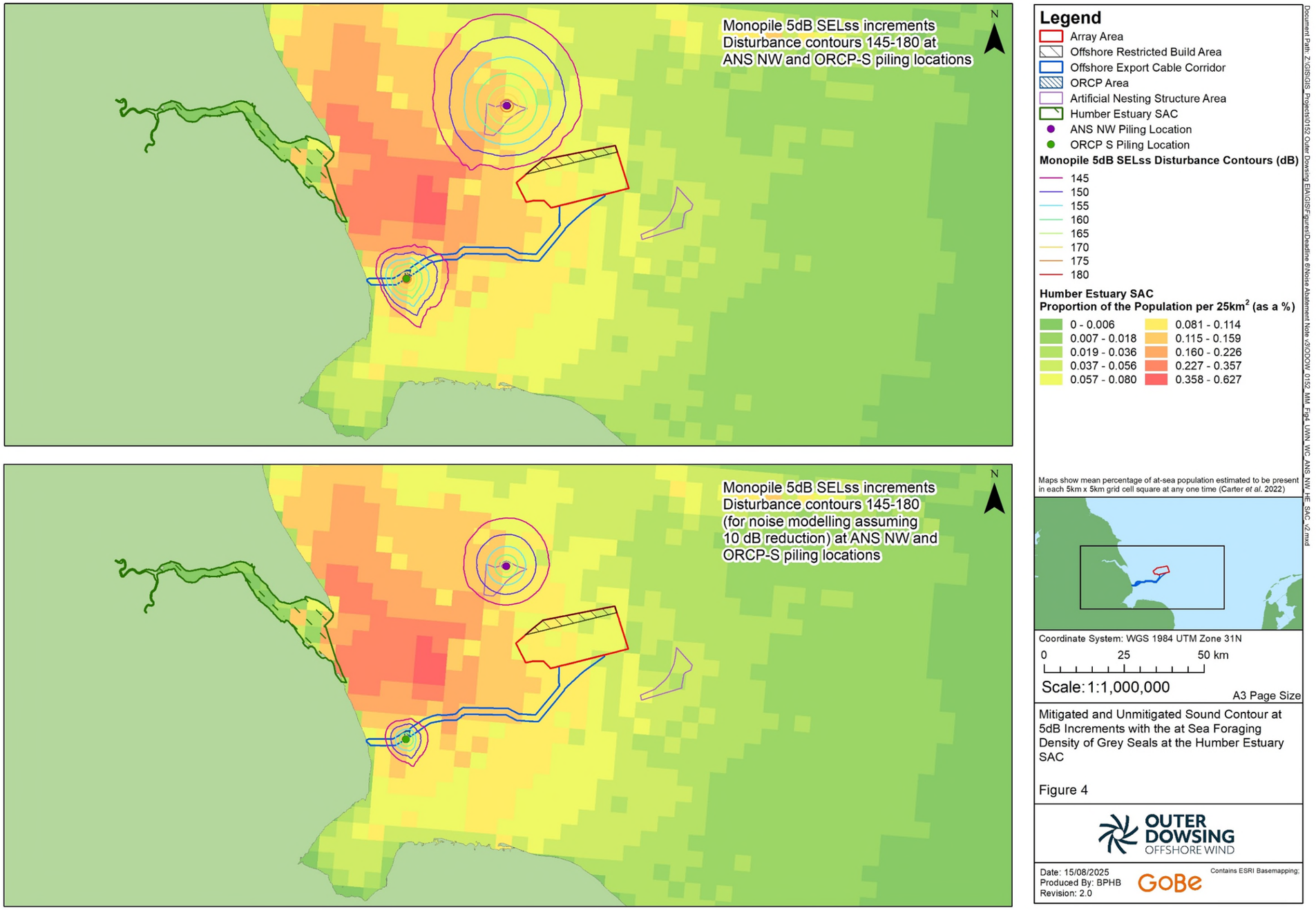

Figure 4 Predicted SEL contours at 5 dB increments for a single monopile installation at the ANS Northwest location, in relation to Humber Estuary SAC

5.3.2 In-combination

75. In Natural England's letter dated 11th July 2025, Natural England advised that further evidence would be required to demonstrate there will be no AEoI on the grey seal features of The Humber Estuary SAC and Ramsar site and to show that the overall cumulative impact is reduced.

76. As described in paragraph 72 and shown in Figure 4 the number of grey seals disturbed by the Project would be reduced to 205 individuals when a 10 dB reduction in source levels is assumed for mitigated piling, as a result the number of seals disturbed in-combination would also be reduced. Other projects have either already committed to or will be required to commit to the Defra (2025) policy which would further reduce any in-combination disturbance impact.

77. Hence, the Project maintains there will be no AEoI to the habitat (its structure and function, extent and distribution and the supporting processes on which the habitats depend) together with the population and distribution of the species of grey seal at the Humber Estuary SAC and Ramsar site as a result of the Project and in-combination projects during construction and therefore, subject to natural change, the population and distribution of grey seal will be maintained in the long-term. The Applicant considers that, with the inclusion of the further detail in this Note requested by Natural England, an AEoI on the grey seal feature of the Humber Estuary SAC can be confidently ruled out both from the project alone and in combination.

6 Conclusion

78. Since the close of the Examination, following discussions with Natural England, the Applicant has committed to:

> *"deploy primary and/or secondary noise reduction methods (Noise Abatement Systems) for pile driving."*

79. The Outline MMMP for Piling activities (document reference 8.6.1) (secured under Condition 13(f), Part 2 of Schedule 10 and 11 of the DCO and Condition 11(e), Part 2 of Schedule 12, 13, 14 and 15 of the DCO) and the In-Principle SIP (document reference 8.7) (secured under Condition 22, Part 2 of Schedule 10 and 11 of the DCO and Condition 15, Part 2 of Schedules 12, 13, 14, and 15 of the DCO) were updated in line with advice from Natural England to reflect this commitment by the Applicant. Additionally, the Applicant updated dML Condition 13(f) of Schedules 10 and 11 and Condition 13(e) of Schedules 12, 13, 14, and 15 of the draft DCO (document reference 3.1) at in the response to the Request for Information dated 12th August to secure the commitment to NAS. This Clarification Note has demonstrated the potential noise reduction associated with the implementation of noise reduction methods including NAS, and the potential benefits of such noise reduction.

80. A 10 dB reduction has been assumed as the minimum noise reduction across NAS and modelled to demonstrate the benefits that could be achieved through the adoption of a primary and/or secondary noise reduction methods. The updated modelling presents a decrease in impact ranges for all marine mammal species, importantly bringing PTS-onset ranges to within mitigatable distances through monitoring alone, potentially limiting the need for ADDs by the Project.

81. The commitment to and implementation of NAS would also notably reduce the Project's contribution to disturbance of harbour porpoise in the Southern North Sea SAC and is also anticipated to cause a similar reduction in the disturbance of the harbour seal feature of the Wash and North Norfolk Coast SAC, and the grey seal feature of the Humber Estuary SAC, such that AEoI on either site can be confidently ruled out. In addition, there are other mechanisms in place to avoid significant disturbance in the Southern North Sea SAC (i.e. the SIP process), which should give full confidence that there will not be an AEoI on the Southern North Sea SAC.

82. The Applicant believes that they have addressed the outstanding issues related to NAS raised at Deadline 6 and in the letter dated 11th July 2025, and would be grateful for agreement with Natural England that these matters are resolved.

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