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Dyddiad/Date: 20/02/2025

Er sylw / For the attention of: Robert Jackson

Annwyl / Dear Robert,

PROPOSED MORECAMBE OFFSHORE WINDFARM GENERATION

**ASSETSCYFEIRNOD YR AROLYGIAETH GYNLLUNIO / PLANNING
INSPECTORATE REFERECE: EN01012**

EIN CYFEIRNOD / OUR REFERENCE: 20049491

RE: NATURAL RESOURCES WALES' DEADLINE 4 SUBMISSIONS

Thank you for your Rule 8 letter, dated 30th October 2024, requesting Cyfoeth Naturiol Cymru / Natural Resources Wales' (NRW) comments regarding the above.

Please find below NRW's Deadline 4 submissions which comprises advice on the submissions produced by the Applicant submitted at Deadline 3 on 22nd January 2025.

The documents that we have reviewed for Deadline 4 include:

- [REP3-006] 4.10 Habitats Regulations Assessment Screening Report - Revision 02 (Volume 4) (Clean)

- [REP3-008] 4.11 Habitats Regulations Assessment Without Prejudice Derogation Case - Revision 03 (Volume 4) (Clean)
- [REP3-039] 5.5 Schedule of Mitigation - Revision 03 (Volume 5) (Clean)
- [REP3-041] 6.2 Outline Project Environmental Management Plan - Revision 03 (Volume 4) (Clean)
- [REP3-045] 6.4 In Principle Monitoring Plan - Revision 02 (Volume 6) (Clean)
- [REP3-047] 6.9 Outline Vessel Traffic Management Plan - Revision 03 (Volume 6) (Clean)
- [REP3-056] 9.22 Offshore Ornithology Technical Note 1 (EIA) - Revision 02 (Volume 9) (Clean)
- [REP3-058] 9.23 Offshore Ornithology Technical Note 2 (HRA) - Revision 02 (Volume 9) (Clean)
- [REP3-060] 9.25 Marine Mammal Technical Note 1 (EIA) - Revision 02 (Volume 9) (Clean)
- [REP3-062] 9.26 Marine Mammal Technical Note 2 (HRA) - Revision 02 (Volume 9) (Clean)
- [REP3-064] 9.37 Habitats Regulations Assessment Without Prejudice Derogation Case – Red-Throated Diver at Liverpool Bay / Bar Lerpwl SPA - Revision 01 (Volume 9)
- [REP3-065] 9.38 Outline Compensation Implementation and Monitoring Plan – Red-throated diver - Revision 01 (Volume 9)
- [REP3-067] 9.40 Supporting Ornithological Papers - Revision 01 (Volume 9)

This response only provides advice and comments from NRW's Advisory (NRW (A)) function. We have provided advice specifically on marine ornithology and marine mammals regarding in-combination and cumulative effects considering the Applicant's Deadline 3 submissions. Where we have not provided explicit advice, it can be taken that we have no further comments to make at this stage and that the ExA should refer to our previous submissions on those matters.

These representations and attachments should be read in conjunction with advice previously provided into the examination.

NRW continues to engage with the Applicant throughout the examination to resolve outstanding matters.

The comments provided in this submission, comprise NRW's response as a Statutory Party under the Planning Act 2008 and Infrastructure Planning (Interested Parties) Regulations 2015 and as an 'Interested Party' under s102(1) of the Planning Act 2008.

Our comments are made without prejudice to any further comments we may wish to make in relation to this application and examination whether in relation to the Environmental Statement (ES) and associated documents, provisions of the draft

Development Consent Order ('DCO') and its Requirements, or other evidence and documents provided by Flotation Energy ('the Applicant'), the Examining Authority or other Interested Parties.

Should further clarity be required, we will be pleased to answer these further through the Examining Authority questions and / or a Rule 17 request(s).

Please do not hesitate to contact Rebekah Newstead [REDACTED] [\[REDACTED\]@cyfoethnaturiolcymru.gov.uk](mailto:[REDACTED]@cyfoethnaturiolcymru.gov.uk) and Bridget Randall-Smith [REDACTED] [\[REDACTED\]@cyfoethnaturiolcymru.gov.uk](mailto:[REDACTED]@cyfoethnaturiolcymru.gov.uk) should you require further advice or information regarding these representations.

Yn gywir / Yours sincerely,

[REDACTED]

Andrea Winterton
Marine Services Manager
Natural Resources Wales

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1. Marine Ornithology

Offshore Ornithology Comments on the Applicant's submissions at Deadline 3

1.1. Habitats Regulations Assessment Screening Report, Revision 02 [REP3-006: clean/REP3-007: tracked]

1. Updates to this document have been made to ensure the appendices and screening summaries align. This does not include any amendments to address NRW (A)'s comments regarding offshore ornithology, and we therefore have no comments to make on this document. We refer to previous comments raised in our submission at Deadline 3 [REP3-094].

1.2. Habitats Regulations Assessment Without Prejudice Derogations Case, Revision 03 [REP3-008: clean/REP3-009: tracked]

2. NRW (A) note that this document relates to compensation measures for English lesser black-backed gull Special Protection Areas (SPAs) (Morecambe Bay & Duddon Estuaries SPA and Ribble & Alt Estuaries SPA). As these English sites are not within NRW's remit, we have not provided any comments on this document.

1.3. Offshore Ornithology Technical Note 1 (EIA), Revision 02 [REP3-056: clean/REP3-057: tracked]

1.3.1. Updated Manx shearwater abundances and assessments

3. NRW (A) welcome the updated Manx shearwater project alone Environmental Impact Assessment (EIA) scale assessment presented by the Applicant in Section 2.2.1.4 of REP3-056. We agree with the seasonal mean peak abundances and the overall annual predicted impacts from the project alone. However, as the Environmental Statement (ES) will likely be referred to by future projects to access the abundances and predicted impacts for the Morecambe Generation Assets project for inclusion in future cumulative assessments, we advise that the Applicant includes these corrected figures and assessments in an updated version of the Offshore Ornithology ES Chapter. This advice also applies to the updated gannet seasonal mean peaks and associated amended assessments as presented in PD1-010. Currently the information for these two species is contained within two separate submission documents to the ES chapter.
4. NRW (A) also welcome that the contribution of the Morecambe Generation Assets project to the Manx shearwater cumulative assessment has been updated to include the revised project alone figures in Section 3.2.1.2 of REP3-056. Similarly, we recommend that an updated version of the ES Chapter, including the full cumulative assessments including gap filled historic projects, is submitted into the examination, so that all the numbers feeding into the cumulative assessments are readily and easily accessible within one place for future projects to use this

information. Please also note our Deadline 3 comments [REP3-094] regarding the cumulative gap fill approaches.

1.3.2. Assessment of impacts to features of Pen y Gogarth / Great Orme's Head SSSI

1.3.2.1. Key Comments

5. NRW (A) welcome that the Applicant has submitted a detailed quantitative assessment of impacts of the Morecambe Generation Assets project alone and cumulatively on the kittiwake, guillemot and razorbill features of the Pen y Gogarth / Great Orme's Head Site of Special Scientific Interest (SSSI). We advised that this should be undertaken in both our comments on the [Applicant's Preliminary Environmental Information Report \(PEIR\)](#), and in our Written Representation [REP1-099]. We note that the Applicant did not engage with or discuss their approach for this assessment with NRW (A) prior to the submission of their assessment in Section 5 of REP3-056 into examination. As a result there are some aspects of the assessment approach where we have concerns/queries or that we would not agree with/advise are undertaken, namely:
 - a) The approach to the calculation of non-breeding season apportionment rates to the Pen y Gogarth / Great Orme's Head SSSI (see Section 1.3.2.2.2 below).
 - b) NRW (A) do not agree with the use of the non-breeding season stable-age structures from Furness (2015) for age-class apportioning in the breeding season. We consider that the Applicant's use of this approach risks significantly underestimating cumulative impacts on adult breeding birds (see Section 1.3.2.3.1 below).
 - c) The Applicant has included different figures for the Morecambe Generation Assets project alone in the cumulative assessments to those predicted in the project alone assessment. This appears to be related to the cumulative assessment using the non-breeding season stable age structures from Furness (2015) to apportion to adults in both the breeding and non-breeding season(s) (see Section 1.3.2.3 below).
 - d) NRW (A) welcome that the cumulative assessments have included the gap-filled historic projects. However, we note that the Barrow, North Hoyle and Llŷr 1 projects have not been included. As per our advice provided in paragraph 6 of REP3-094, we recommend that these projects are also included within the cumulative assessments (see Section 1.3.2.3 below).
 - e) Whilst we welcome that the Applicant has run Population Viability Analyses (PVA)'s, we note that these have been run on the predicted impacts based on the Applicant's preferred % displacement and % mortality rates only. We advise the Applicant also includes PVA outputs for predicted impacts for the project alone and cumulatively for the worst-case scenario of the NRW (A) advised range (e.g., for auks that is 70% displacement and 10% mortality) as well (see Section 1.3.2.4 below).

6. Further information on each of these issues is set out in our detailed comments below.

1.3.2.2. Apportionment of impacts to the Pen y Gogarth/Great Orme's Head SSSI colony

1.3.2.2.1. Breeding season apportionment of impacts

7. NRW (A) are content with the approach used to calculate the breeding season apportionment value for apportioning impacts to the colony in the breeding season (i.e., the NatureScot apportionment tool). Therefore, we are content with the calculated breeding season apportionment rates to the SSSI (10.95% for guillemot, 11.21% for razorbill and 4.93% for kittiwake) used by the Applicant in REP3-056.

1.3.2.2.2. Non-breeding season apportionment of impacts

8. NRW (A) agree that to estimate the non-breeding population of the Great Orme's Head SSSI predicted to be present within the relevant species-specific regional non-breeding season(s) Biologically Defined Minimum Population (BDMPS), the most appropriate colony counts to use are the SSSI counts from 2000.
9. In our Written Representations [REP1-099, paragraph 29], NRW (A) advised that for apportionment of impacts to the SSSI for the non-breeding seasons, the information in the respective Appendix A tables from Furness (2015) should be used as per the approach the Applicant had taken for non-breeding season apportionment to SPAs. As the SSSI colony will not be specifically listed in the Furness (2015) tables, we advised that apportionment is informed by use of the adult proportion of birds for the 'western non-SPA colonies' in the Furness (2015) Appendix A tables [REP1-099, paragraph 29]. The Applicant has not followed this approach in REP3-056, and instead appears to have taken different approaches depending on the feature assessed – i.e. following the Mona Applicant's approach for razorbill and kittiwake non-breeding season colony apportionment, but assuming 100% of adults from the SSSI colony will remain in the respective non-breeding season BDMPS for guillemot.
10. For each species and non-breeding season, the Applicant has calculated the number of adults from the Pen y Gogarth/Great Orme's Head SSSI expected to remain within the relevant species non-breeding season BDMPS and calculated the apportionment rate based on the number of adult birds from the colony expected to be present as a proportion of the BDMPS adult bird total. This is in contrast to the approach taken by the Applicant for apportionment in the non-breeding season for the SPAs in the Report to Inform Appropriate Assessment (RIAA) [REP1-012, updated version]. Here, the Applicant calculated the apportionment rate based on the number of adult birds from the colony expected to be present as a proportion of the BDMPS all ages bird total. The approach taken for the SPAs follows the NRW advised standard approach. Therefore we recommend that the apportionment to the SSSI for the non-breeding season(s) should be based on the proportion of the SSSI adult birds (we suggest that this is based on the adult proportion of birds for the UK western non-SPA colonies in the Furness 2015 Appendix A tables as advised in our Written Representations [REP1-

099]) and applied across the BDMPS total of birds of all ages for each relevant non-breeding BDMPS season.

Table 1 Comparison of non-breeding season apportionment rates to the Pen y Gogarth/Great Orme's Head SSSI calculated via the NRW advised approach and those used by the Applicant in REP3-056

Species & BDMPS region	Non-breeding season*	BDMPS region birds of all ages total* (A)	Proportion of adults in BDMPS from western non-SPA colonies* (B)	Colony count, breeding adults (2000)** (C)	Number of adults from SSSI in BDMPS in non-breeding season (D=BxC)	NRW calculated seasonal apportionment rate (%) (D/Ax100)	Applicant calculated seasonal apportionment rate (%)**
Guillemot : UK western waters	Non-breeding	1,139,220	0.95	2,253	2,140	0.19	0.34
Razorbill: UK western waters	Migration (spring & autumn)	606,914	0.98	302	296	0.05	0.09
	Winter	341,422	0.3	302	91	0.03	0.07
Kittiwake: UK western waters & Channel	Spring migration	691,526	0.8	2,294	1,835	0.27	0.49
	Autumn migration	911,586	0.6	2,294	1,376	0.15	0.28

* From Tables in Appendix A of Furness (2015)

** As used by Applicant in REP3-056

11. Based on the above, the Applicant's approach to calculating non-breeding season apportionment rates for the project alone appears to be precautionary (see Table 1). However, we note that in this case for the project alone, as the numbers of birds involved are small, our preferred approach to calculating non-breeding season(s) apportionment rates to the SSSI does not result in significant differences in the adult bird abundances (auks) or adult densities (kittiwake) apportioned to the site in terms of annual project alone totals. Therefore, it also does not result in significant differences to the annual predicted project alone displacement and collision mortalities to the colony. However, this may not be the case for other offshore wind development sites where higher numbers/densities of birds are recorded. Therefore, we advise that other projects do not use the Applicant's approach to apportioning non-breeding season impacts to SSSI colonies where an assessment of impacts to SSSI breeding seabird colonies is required. This advice was also provided during the Mona examination (see Section 2.2.1 of NRW (A)'s Deadline 2 response: [EN010137-000953-Natural Resources Wales Deadline 2 Submission 27.08.2024.pdf](#)).

1.3.2.3. Cumulative assessments

12. NRW (A) welcome that the Applicant has undertaken a cumulative assessment of impacts on the Pen y Gogarth/Great Orme's Head SSSI features in REP3-056 and included the gap-filled historic projects in these cumulative assessments.

However, after reviewing the Applicant's approach to apportionment of impacts from OWF projects in the cumulative assessments, we have significant concerns. We consider that the approach may underestimate the potential levels of cumulative impacts. As a result, we consider it inappropriate to comment on the potential significance of cumulative impacts at this stage.

13. For the apportionment of impacts from projects included in the cumulative assessment - both for the breeding and the non-breeding seasons - the Applicant appears to have applied the non-breeding season stable age structures from Furness (2015) to apportion impacts to adults before applying calculated colony apportionment rates. This approach does not appear to have been used in the assessment of project alone impacts and consequently there appears to be different abundance and collision estimates for the Morecambe Generation Assets project in the cumulative assessment compared to those predicted in the project alone assessments. NRW (A) advise that this issue is given further consideration.
14. As advised in our Deadline 3 response [REP3-094, paragraph 6], given the issues/lack of clarity regarding consented lifespans of early offshore wind projects, we recommend that the Barrow and North Hoyle projects are included within the cumulative assessments and are gap filled where required. Additionally, in line with our advice for the Mona and Morgan Generation Projects, we also recommend including the Llŷr 1 project within these assessments.

1.3.2.3.1. Breeding season apportionment in cumulative assessments

15. NRW (A) do not agree with the use of the Furness (2015) non-breeding season stable-age structures for age-class apportioning during the breeding season. This advice was also provided during the Mona project examination regarding their SPA in-combination and Great Orme's Head SSSI cumulative assessments (see Sections 1.1.2 and 1.1.4.3.2 of NRW (A)'s Deadline 5 response: [EN010137-001765-Natural Resources Wales - Deadline 5 Submission.pdf](#)). Furness (2015) does not present a stable age structure for the breeding season-the report covers purely the non-breeding season(s). The UK Western waters (and for some species, the Channel) cover a vast area, incorporating all territorial waters from the west of Cornwall in the south, and Orkney in the north. Given the scale, the ratio of adults to immature birds is likely to be highly spatially variable, and there is no basis to assume that the ratio is applicable to a small project study area. This is essentially what the Applicant is doing when age class apportioning predicted EIA scale impacts for each individual project included in the cumulative assessment for the SSSI colony. It is noted by Furness (2015) that: *"at sea distribution of seabirds differs between age classes, with youngest birds tending to spend their time in the winter quarters even during summer, breeding adults tending to stay closest to their breeding area, and immature birds probably at sea in areas that have good food supplies, but are away from large colonies. Therefore, it is not clear that any at sea data on proportions of different age classes would provide a secure test of the estimated proportions based on demographic data."*
16. In the Morecambe project-alone assessments in the RIAA [REP1-012, updated version], the Applicant has used the proportions of adults recorded during the breeding season in the site-specific Digital Aerial Survey (DAS) data. For species

where age-class identification was not possible from site-specific DAS, it was assumed that 100% of birds were adults, in line with SNCB advice. Site-specific breeding season age class data are available for kittiwake for some of the other projects included in the cumulative assessment (see Table 2 below) and we therefore advise that this information is used for these projects. For all other projects where there is no site-specific data available (e.g. gap-filled historic projects), or for species where age-class identification is not possible (e.g. auks), the approach of assuming 100% of birds are adults should be applied. Additionally, Table 2 below indicates that the proportions of adult kittiwakes recorded in the surveys for these projects are higher than those from the Furness (2015) stable-age structure used by the Applicant. **Therefore, we consider that the Applicant's approach of apportioning according to the stable age structure ratio risks significantly underestimating cumulative impacts on adult breeding birds.**

Table 2 Proportions of adult kittiwake recorded in site-specific DAS data in breeding season at individual projects compared with stable-age structures used by the Applicant for breeding season age-class apportioning in the Pen y Gogarth/Great Orme's Head SSSI

Species	Site-specific proportions of adults from DAS data		Breeding season adult % used by Applicant (from Furness 2015)			
	Mona*	Morgan Generation**	Morecambe Generation**	Awel y Môr****	Erebus****	
Kittiwake	95.36%	84.11%	96%	-	100%	53%

* From Table 1-4 of Mona Offshore ornithology supporting information in line with SNCB advice F02: [https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010137/EN010137-001495-S_D3_19_Mona%20Offshore%20Ornithology%20Supporting%20Information_F02%20\(Clean\).pdf](https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010137/EN010137-001495-S_D3_19_Mona%20Offshore%20Ornithology%20Supporting%20Information_F02%20(Clean).pdf)

** Based on information provided in Table 1.4 of Morgan Generation Assets submission ES Volume 4, Annex 5.5: Offshore ornithology apportioning technical report: [F4.5.5 Morgan Gen Offshore Ornithology Apportioning TR](#)

*** Based on information provided in APP-071

**** Based on information provided in Table 16 of Report to Inform Appropriate Assessment: https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/projects/EN010112/EN010112-000144-5.2_AyM_RIAA_vFinal.pdf

***** Based on information in Offshore Ornithology 11.1 Technical Appendix - Baseline Data: <https://www.bluegemwind.com/wp-content/uploads/2020/07/Erebus-ES-Vol-3-Appendix-11.1-Baseline-Data-2.pdf>

1.3.2.3.2. Non-breeding season apportionment in cumulative assessments

17.NRW (A) refer to comments in Section 1.3.2.2.2 regarding the Applicant's approach to non-breeding season apportionment for the project alone. It appears that in the Applicant's approach to non-breeding season apportioning in the cumulative assessment, the Applicant has applied the same approach used for calculating the non-breeding season apportionment of impacts to the SSSI site. For example, a 0.49% apportionment rate to the SSSI for kittiwake in the spring migration season has been applied to all projects in the cumulative assessment. However, in the cumulative assessment, the Applicant has also apportioned the impacts to age-classes (i.e. to adults) before applying the site apportionment rate.

The age-class apportionment of impacts to adults prior to apportionment of impacts to the SSSI again uses the stable age-structures from Furness (2015).

18. We note that the Applicant's approach in the cumulative assessment was also taken by the Mona Applicant in their apportionment to SPAs and the Great Orme's Head SSSI for the non-breeding season (i.e. age-classes and apportioning to the SSSI) in their SSSI cumulative and HRA in-combination assessments. Whilst this caused significant confusion during the Mona examination, it was eventually agreed that the Mona Applicant's and the SNCB/NRW's approaches would result in the same apportioning percentages as both approaches are using different calculations to reach the same outcome (see Section 1.4.2 of Mona Applicant's Deadline 4 submission: [Offshore ornithology apportioning clarification note](#) and Section 1.1.4.3.1 of NRW's Deadline 5 response: [EN010137-001765-Natural Resources Wales - Deadline 5 Submission.pdf](#)). However, we would welcome further discussion or clarification from the Morecambe Applicant that this is also the case in this instance.

1.3.2.4. Percentage displacement and percentage mortality rates assessed in auk feature displacement assessments

19. In our Written Representations [REP1-099], NRW (A) advised that guillemot and razorbill displacement assessments should be based on the displacement matrix approach. Due to the uncertainty around specific displacement and mortality rates, the assessments should consider a range of displacement rates (i.e., for auks 30-70% displacement and 1-10% mortality). We welcome that the Applicant has presented project alone and cumulative apportioned impacts across the advised range of 30-70% displacement and 1-10% mortality in REP3-056 for both guillemot and razorbill displacement assessments. However, we note that the Applicant has only run PVAs on the project alone and cumulative predicted impacts using the Applicant's preferred rates of 50% displacement and 1% mortality for both species. We advise that PVAs should also be run, and the outputs provided for the advised Worst-Case Scenario (WCS) impacts, (i.e. at 70% displacement and 10% mortality for both auk species) as the predicted impacts in this scenario for the SSSI exceed 1% baseline mortality for the project alone and cumulatively for both species. This information is required before we can reach conclusions on the level of significance of the predicted cumulative impacts on auk features of the Pen y Gogarth/Great Orme's Head SSSI. We note that both the Mona and Morgan Generation Assets have run PVAs for the advised WCS cumulative impacts on guillemot and razorbill for this SSSI. As these models could be considered to represent best available evidence at this time, the Applicant could consider referring to them and presenting the relevant information including the output metrics (counterfactuals, growth rates etc).
20. NRW (A) highlight the recent Mona and Morgan Generation Assets Offshore Windfarm examinations, where we have concluded that a significant adverse impact (i.e., not significant at EIA scale) can be ruled out for cumulative displacement on guillemot and razorbill features of the Pen y Gogarth/Great Orme's Head SSSI. Given that the Morecambe Generation Assets project is in examination concurrently with the Mona and Morgan Generation projects, and that all three projects are in the north Irish Sea/Liverpool Bay area, we would expect

the cumulative assessments to include the same projects and similar totals for all three projects. Therefore, we consider it likely that we will be able to reach the same conclusions regarding cumulative assessments for these features of the Pen y Gogarth/Great Orme's Head SSSI for the Morecambe Project. However, we cannot form this conclusion definitively until further consideration of our advice on cumulative assessments in Section 1.3.2.3, and the required PVA outputs for the advised WCS (Section 1.3.2.4, paragraph 19) are presented by the Applicant.

1.3.2.5. Species specific comments

1.3.2.5.1. Guillemot

21. As noted in Section 1.3.2.4, the Applicant has only run PVAs for predicted alone and cumulative impacts based on predicted impacts for the Applicant's preferred rates of 50% displacement and 1% mortality. NRW (A) advise that, given the uncertainty and variability in guillemot displacement impacts from OWFs, a range of rates from 30-70% displacement and 1-10% mortality should be considered. Whilst the Applicant has presented predicted impacts across this range, they have not run PVAs for the WCSs. For the project alone, the predicted impact for the WCS of 70% displacement and 10% mortality is 50.82 guillemots per annum from the SSSI, equating to 20.94% of baseline mortality of the SSSI colony [REP3-056, Table 5.1]. For the cumulative assessment, the predicted impact for this WCS is 91.87 guillemots per annum from the SSSI, equating to 37.86% of baseline mortality of the SSSI colony [REP3-056, Table 5.3 and 5.4]. As noted in Section 1.3.2.3.1, this cumulative total is likely an underestimate due to the Applicant's use of 57% adults (from the stable age structure from Furness (2015)) during the breeding season to apportion to adults, rather than the advised approach of assuming 100% of birds are adults (as was undertaken for the SPAs in the Report to Inform Appropriate Assessment (RIAA) [REP1-012, updated version]).
22. When advising on the level of significance of impacts to the SSSI, NRW (A) will consider the full range of predicted impacts. However, for us to do this, we would advise that the Applicant also provides PVA outputs for the WCS/upper end of the advised range of rates where the predicted impacts for this exceed 1% baseline mortality of the relevant populations. This is the case for both project alone and cumulative impacts.

1.3.2.5.2. Razorbill

23. As noted in Section 1.3.2.4, the Applicant has only run PVAs on the predicted alone and cumulative impacts based on predicted impacts for the Applicant's preferred rates of 50% displacement and 1% mortality. NRW advise that, given the uncertainty and variability in razorbill displacement impacts from OWFs, a range of rates from 30-70% displacement and 1-10% mortality should be considered. Whilst the Applicant has presented the predicted impacts across this range, they have not run PVAs on the WCSs. For the project alone, the predicted impact at the WCS of 70% displacement and 10% mortality is two razorbills per annum from the SSSI, which equates to 3.9% of baseline mortality of the SSSI colony [REP3-056, Table 5.6]. For the cumulative assessment, the predicted impact for this WCS is 5.51 razorbills per annum from the SSSI, which equates to 10.58% of baseline mortality of the SSSI colony [REP3-056, Table 5.8 and 5.9]. As noted in Section 1.3.2.3.1,

this cumulative total is likely an underestimate due to the Applicant's use of 57% adults (from the stable age structure from Furness (2015)) in the breeding season to apportion to adults, rather than the advised approach of assuming 100% of birds are adults (as was undertaken for the SPAs in the RIAA [REP1-012, updated version]).

24. When advising on the level of significance of impacts to the SSSI, NRW (A) will consider the full range of predicted impacts. However, to do this, we advise that the Applicant updates the cumulative assessment to take account of the comments in Section 1.3.2.3 and provides PVA outputs for the WCS/upper end of the advised range of rates where the predicted impacts for this exceed 1% baseline mortality of the relevant populations, which is the case here for both project alone and cumulative impacts.
25. REP3-056, Paragraph 178 states: '*Due to an apparent error in the Natural England Seabird PVA tool for razorbill (January 2025), guillemot demographic parameters were used as a proxy to run the PVA.*' We assume that the error the Applicant is referring to is regarding the default global immature survival rates provided in the JNCC/NE PVA tool being incorrect, as they represent compound values across immature age classes, taken from Horswill & Robinson (2015), rather than age specific values. This includes the rates for razorbill. This issue was identified in March 2024 and, alongside the advised corrections for affected species, was included in the Natural England (NE) and NRW (A) interim advice note, which was submitted in NE's Morecambe Relevant Representations [RR-061] in August 2024. Therefore, we question why the Applicant has used guillemot demographic parameters as a proxy and suggest that the PVAs are run with the advised razorbill corrected figures. We also understand that NE updated the PVA tool default rates to correct these compound rates with those advised in the NE and NRW (A) interim advice note in December 2024.

1.3.2.5.3. Kittiwake

26. In the RIAA [REP1-012, updated version], the Applicant applied site-specific information on the proportion of adult kittiwakes recorded in the baseline digital aerial survey data (DAS) during the breeding season, to age class apportion predicted impacts to the SPAs to adult kittiwakes only. In the Pen y Gogarth/Great Orme's Head SSSI breeding season assessment for the project alone, the Applicant does not appear to have applied any age-class apportionment using the DAS data to age-class apportion kittiwake in the breeding season. We would welcome clarification on this issue. We suggest that the proportion of adult kittiwakes in the breeding season DAS survey data could be used to inform age-class apportionment of impacts in the breeding season for the SSSI assessment in the same way as in the SPA assessments. However, as it appears that the Applicant has assumed 100% of birds in the breeding season are adult and that the apportioned impacts from the project alone are potentially precautionary, we have used the Applicant's predicted impacts to assess the significance of the predicted collision impact from the project alone.
27. The impact from the project alone is predicted to be 0.78 kittiwake collisions per annum from the SSSI [REP3-056, Table 5.11], equating to 0.47% of baseline mortality for the colony (based on the 2023 colony count and an adult mortality rate

of 14.6%, as used by the Applicant). We note that the predicted mortality at the upper 95% Confidence Interval (CI) from the stochastic Collision Risk Model (sCRM) of 1.73 collisions per annum equates to 1.04% of baseline mortality of the colony. Given that the Applicant's apportioned impacts may be slightly overly precautionary and that the predicted level of mortality only just exceeds 1% of the baseline mortality rate of the colony towards the upper end of the 95% CIs, we agree that the predicted impact from collision on the kittiwake feature of the Great Orme's Head SSSI from the project alone could be considered to be of minor adverse significance (i.e., not significant in EIA terms).

28. For cumulative assessments, we recommend the Applicant considers the advice provided in Section 1.3.2.3. However, we highlight the recent Mona and Morgan Offshore Windfarm examinations, where we concluded that a moderate adverse effect (i.e., significant at EIA scale) cannot be ruled out for cumulative collisions for the kittiwake feature of the Great Orme's Head SSSI. Since the Morecambe Generation Assets project is in examination concurrently with the Mona and Morgan Generation Assets projects and that all three projects are in the north Irish Sea/Liverpool Bay area, we would expect the cumulative assessment to include the same projects and have similar cumulative totals for all three projects. Therefore, we consider it likely that we will reach the same conclusions regarding cumulative kittiwake collision for the Great Orme's Head SSSI for the Morecambe Project. However, we cannot form this conclusion definitively until the Applicant provides updated assessments considering our comments above.

1.3.3. Minor Comments

29. We note that in REP3-056, paragraph 134, the Applicant states that: *'The qualitative assessment of SSSIs provided in paragraphs 12.423 - 12.424 of ES Volume 5, Chapter 12 [REP1-032] concluded that impacts on individual SSSIs would be of negligible magnitude (except for great black-backed gull associated with Puffin Island SSSI).....'*

30. We advise that great black-backed gull is not a qualifying/notified feature of the Ynys Seiriol / Puffin Island SSSI; the only seabird qualifying/notified feature of this site is cormorant.

1.4. Offshore Ornithology Technical Note 2 (HRA), Revision 02 [REP3-058: clean/REP3-059: tracked]

1.4.1. General Comments

31. Our advice below focuses on the updated assessments for the Welsh SPAs only, as these are the sites within our remit.

1.4.1.1. Project Alone Assessments

32. NRW (A) welcome the Applicant's update to the apportioned project alone impacts for the Manx shearwater and gannet features of the relevant Welsh SPAs to account for the updated Manx shearwater and gannet project alone EIA scale assessment presented by the Applicant in Section 2.2.1.4 of REP3-056 (Manx shearwater) and in Section 4 of PD1-010 (gannet).

33. NRW (A) agree with the apportionment approaches used for these sites and features for the project alone assessment and welcome the provision of the full displacement matrices for the project alone impacts in REP3-058.
34. Based on the information provided for these sites and features, we can now reach conclusions on the potential significance of project alone impacts to these features of the relevant Welsh designated sites (see Sections 1.4.2.1.11.4.2.2.11.4.2.3.1 for detail). However, as the RIAA will likely serve as a key reference for future projects to access the apportioned abundances and predicted impacts for the Morecambe Generation Assets project, to include in future in-combination assessments, we advise that the Applicant includes these corrected figures and assessments in an updated version of the RIAA.

1.4.1.2. In-combination Assessments

35. NRW (A) welcome the inclusion of gap-filled historic projects in the in-combination assessments presented for the following Welsh SPAs and features:
- Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island (AC & BI) SPA: Manx shearwater
 - Sgomer, Sgogwm a Moroedd Penfro/Skomer, Skokholm and seas off Pembrokeshire (SSSP) SPA: Manx shearwater
36. However, we have some concerns regarding the apportionment approaches used in these in-combination assessments. The Applicant has applied a weighted mean approach to calculate an annual apportionment rate for SPA colonies for each OWF included in the in-combination assessments. This annual apportionment rate approach differs from the standard approach to apportionment, which is to use seasonal breakdowns of impacts and seasonal apportionment rates for each project included in the in-combination assessment. We are concerned that the approach may underestimate apportioned impacts.
37. Regarding the weighted mean approach to calculating an annual apportionment rate to the Manx shearwater SPA colonies for each season, it is unclear whether the Applicant has included the non-breeding/winter season (Nov-Feb) in the calculation. Given the species is not thought to overwinter successfully in British waters (Furness 2015) if this time is included, then it risks underestimating the results. Clarification is required from the Applicant on this matter.
38. In paragraph 37 of REP3-058, the Applicant states that for the apportioning of the gap-filled projects, *'a weighted average annual apportioning rate was used, based on the total (annual) population estimate for each project, due to the lack of reliable seasonal data.'* We find this statement unclear. The Mona and Morgan Generation Assets projects were able to use seasonal breakdowns of predicted impacts for each project going into their in-combination assessment, including for the gap-filled projects, and were able to apply different seasonal apportionment rates (e.g. Mona Applicant's Deadline 7 submission: [E1.3.1 Mona SNCB offshore ornithology ISAA Supporting Information.docx](#)). The Morecambe Applicant has also been able to include seasonal breakdowns of impacts for the other projects (again including the gap-filled projects) in their Pen y Gogarth/Great Orme's Head SSSI cumulative

assessment along with different seasonal apportionment rates [REP3-056]. We seek clarification or justification as to why the Applicant has undertaken different approaches for the apportionment of impacts in the SPA in-combination assessments and the SSSI cumulative assessment.

39. Considering the above issues, we would not recommend the Applicant's approach to apportioning for in-combination assessments in REP3-058 or the RIAA [REP1-012, updated version].
40. Additionally, we note our comments in our Deadline 3 response [REP3-094, paragraphs 10-11] regarding the inclusion of gap-filled projects in updated in-combination assessments for the other Welsh SPA and feature combinations in the RIAA [REP1-012, updated version]. This has not been done in REP3-058 and hence remains outstanding for the SSSP SPA for the following features: lesser black-backed gull (collision), assemblage named components guillemot and razorbill (both for displacement). Consequently, we are unable to reach conclusions on in-combination impacts for these features of the SSSP SPA at this stage.

1.4.2. Conclusions/advice regarding the Welsh SPAs assessed in REP3-058

1.4.2.1. Glannau Aberdaron ac Ynys Enlli/Aberdaron Coast and Bardsey Island (AC & BI) SPA: Manx shearwater

1.4.2.1.1. Project Alone Impacts

41. Based on the predicted impacts in REP3-058, Table 3.5 and 3.6, the Applicant calculates that the project alone displacement total is 1–32 adult Manx shearwaters from the AC & BI SPA per annum (based on 30-70% displacement and 1-10% mortality). This equates to 0.03-0.75% of baseline mortality for the AC & BI SPA Manx shearwater colony, which is below 1% of baseline mortality and can be considered undetectable against background mortality. As a result the Manx shearwater population Conservation Objective target of 20,000 adults (10,000 pairs)¹ is achievable. Based on these figures, we agree with the Applicant that there **would be no adverse effect on site integrity (AEoSI) for predicted displacement impacts on the Manx shearwater feature of the AC & BI SPA from the project alone.**

1.4.2.1.2. In-Combination Impacts

42. The Applicant has calculated that an in-combination total of 704 Manx shearwaters from the AC & BI SPA are at risk of displacement [REP3-058, Table 3.7]. Based on an advised range of 30-70% displacement and 1-10% mortality, the predicted in-combination displacement mortality is 2-49 adult Manx shearwaters from the AC & BI SPA per annum, equating to 0.05-1.17% of baseline mortality for the AC & BI SPA Manx shearwater colony. This is at the upper end of the range of % displacement and % mortality rates and hence requires further consideration through PVA. However, the Applicant has not undertaken a PVA for the WCS,

¹ Currently available conservation objective target populations for Aberdaron Coast and Bardsey Island SPA available from: <https://naturalresources.wales/media/672092/glannau-aberdaron-plan-english.pdf>

relying solely on their preferred rates of 50% displacement and 1% mortality. We advise that the Applicant undertakes a PVA for the advised WCS.

43. As noted in Section 1.4.1.11.4.1.2 above, we have concerns that the Applicant's in-combination total impacts may be underestimated due to the use of their weighted mean annual apportionment rates. We note that during the Mona and Morgan Generation Assets project examinations, we have recently been able to conclude that an AEOI could be ruled out for in-combination Manx shearwater displacement impacts for the AC & BI SPA based on higher predicted in-combination impacts than those predicted in REP3-058 by the Morecambe Applicant:
44. Mona Generation Assets (Deadline 7 submission, [E1.3.1 Mona SNCB offshore ornithology ISAA Supporting Information.docx](#)): The predicted in-combination total impact was estimated to be 3-64 adult Manx shearwaters from the AC & BI SPA per annum (for 30-70% displacement and 1-10% mortality), higher than the Morecambe Applicant's figure in REP3-058.
45. Morgan Generation Assets (offshore ornithology summary spreadsheet, [EN010136-000795-S D5a 16.2 Annex 16.2 to Ornithological assessment clarification data Welsh sites.xlsm](#)): the predicted in-combination total impact was estimated to be up to 80 adult Manx shearwaters from the AC & BI SPA per annum (based on a WCS of 70% displacement and 10% mortality), also exceeding the Morecambe Applicant's figure in REP3-058.
46. Given that the Morecambe, Mona and Morgan Generation Asset projects are in examination at the same time and all three projects are in the north Irish Sea/Liverpool Bay area, we would expect the in-combination assessment to include the same projects and produce similar totals. Therefore, we anticipate reaching the same conclusions regarding in-combination Manx shearwater displacement for the AC & BI SPA at Morecambe. However, to do this, we advise that the Applicant considers the comments above regarding their in-combination assessment and provide PVA outputs for the WCS/upper end of the advised range of rates where the predicted impacts for this exceed 1% baseline mortality of the relevant populations, which is the case here for the Applicant's potentially underestimated impacts. We note that both the Mona and Morgan Generation Applicants have run PVAs for the WCS scenario predicted impacts (see above) for this feature of the SPA. As these models represent the best available evidence at this time, the Applicant could consider referring to these and presenting information including the output metrics (counterfactuals, growth rates etc) in any updated assessment.

1.4.2.2. Sgomer, Sgogwm a Moroedd Penfro/Skomer, Skokholm and seas off Pembrokeshire (SSSP) SPA: Manx shearwater

1.4.2.2.1. Project Alone Impacts

47. NRW (A) note a potential error in the SPA population of breeding adults [REP3-058, paragraph 43]. The Applicant quotes this as 455,156 adults and then states that using a 0.13 adult mortality rate, the baseline mortality is 118,341 breeding adult mortalities from the SPA per annum. We note that the units for SPA count

figure of 455,156 is apparently occupied sites (AOS), meaning the actual number of breeding adults is $455,156 \times 2 = 910,312$ breeding adults. We assume that the Applicant has correctly used the figure of 910,312 breeding adults in the calculation of baseline mortality for the colony because $910,312 \times 0.13 = 118,341$ and misquoted the initial population figure.

48. Based on the predicted impacts in REP3-058, Table 3.13 and 3.14, the Applicant calculates that the project alone displacement total is 12-288 adult Manx shearwaters from the SSSP SPA per annum (based on 30-70% displacement and 1-10% mortality). This equates to 0.01-0.24% of baseline mortality for the SSSP SPA Manx shearwater colony, which is below 1% of baseline mortality and considered undetectable against background mortality. Hence there will remain a thriving Manx shearwater population at the site and the Conservation Objective target population of 300,000 adults (150,000 pairs)² could be met. On this basis, we agree with the Applicant that there **would be no Adverse Effect on Site Integrity (AEoSI) for predicted displacement impacts on the Manx shearwater feature of the SSSP SPA from the project alone.**

1.4.2.2.2. In-Combination Impacts

49. The Applicant has calculated that an in-combination total of 15,813 Manx shearwaters from the SSSP SPA are at risk of displacement [REP3-058, Table 3.15]. Based on an advised range of 30-70% displacement and 1-10% mortality, the predicted in-combination displacement mortality is 47-1,107 adult Manx shearwaters from the SSSP SPA per annum, equating to 0.04-0.94% of baseline mortality for the SSSP SPA Manx shearwater colony.
50. As noted in Section 1.4.1.2 above, we are concerned that the Applicant's calculated in-combination total impacts are underestimated due to the use of their weighted mean annual apportionment rates. For the Mona and Morgan Generation Assets project examinations, we have been able to rule out an AEoSI for in-combination Manx shearwater displacement impacts for the SSSP SPA based on higher predicted in-combination impacts than those predicted in REP3-058 by the Morecambe Applicant:
51. Mona Generation Assets (Deadline 7 submission, [E1.3.1 Mona SNCB offshore ornithology ISAA Supporting Information.docx](#)): The in-combination total predicted impact was estimated to be 66-1,547 adult Manx shearwaters from the SSSP SPA per annum (for 30-70% displacement and 1-10% mortality), which is higher than the Morecambe Applicant's figure in REP3-058.
52. Morgan Generation Assets (offshore ornithology summary spreadsheet, [EN010136-000795-S D5a 16.2 Annex 16.2 to Ornithological assessment clarification data Welsh sites.xlsm](#)): The in-combination total predicted impact was estimated to be up to 1,932 adult Manx shearwaters from the SSSP SPA per annum (based on a WCS of 70% displacement and 10% mortality), which is also higher than the Morecambe Applicant's figure in REP3-058.

² Currently available conservation objective target populations for SSSP SPA available from: https://naturalresources.wales/media/673958/Skomer.Skokholm_management_plan_07.pdf

53. Given that the Morecambe, Mona and Morgan Generation Asset projects are in examination at the same time and all three projects are in the north Irish Sea/Liverpool Bay area, we would expect the in-combination assessment to include the same projects and produce similar totals. Therefore, we anticipate reaching the same conclusions regarding in-combination Manx shearwater displacement for the SSSP SPA for the Morecambe Project. However, in order to reach this conclusion, we advise that the Applicant considers the comments above regarding the in-combination assessment and provides PVA outputs for the WCS/upper end of the advised range of rates where the predicted impacts for this exceed 1% baseline mortality of the relevant populations, which is the case here for the Applicant's potentially underestimated impacts. We note that both the Mona and Morgan Generation Applicants have run PVAs for the WCS scenario predicted impacts (see above) for this feature of the SPA. As these models represent the best available evidence at this time, the Applicant could consider referring to these and presenting information including the output metrics (counterfactuals, growth rates etc) in any updated assessment.

1.4.2.3. Grassholm SPA: Gannet

1.4.2.3.1. Project Alone Impacts

54. According to REP3-058, Table 3.20, it appears that the Applicant used the 2015 Grassholm SPA gannet colony count to calculate baseline mortality. However, the Highly Pathogenic Avian Influenza (HPAI) outbreak caused large numbers of mortalities in 2022 and 2023 with the Grassholm SPA gannet colony experiencing 52% reduction in nesting pairs from 2022 to 2023 (Johnstone *et al.* 2022). This is reflected in Seabird Monitoring Programme (SMP) counts: 78,584 adults in 2009, 72,022 in 2015, 32,964 in 2023 and 39,398 in 2024. As the Morecambe Generation Assets site-specific data were collected from March 2021 to February 2023, they overlap with the 2022 HPAI outbreak. Therefore, NRW (A) advise that the 2023 colony count is included in baseline mortality calculations.

55. Tracking data (e.g. from Votier *et al.* 2010) and utilisation distributions (e.g. Wakefield *et al.* 2013) suggest that gannets have been shown to display spatial segregation between colonies, making it unlikely that gannets from Grassholm SPA will forage in the Morecambe Generation Assets project area. Therefore, we are content that the Applicant has considered there to be no connectivity with the site during the breeding season and hence, has not apportioned any impacts to the site in the breeding season.

56. Evidence suggests that gannets show strong macro-avoidance of offshore windfarms (e.g. Dierschke *et al.* 2016; Pavat *et al.* 2023). Therefore, assessments that do not consider macro avoidance should be regarded as precautionary. We are content that the Applicant has followed the advice provided by NE during the evidence plan process and applied a 70% macro avoidance rate to the collision predictions.

57. Gannets have a large foraging range (mean-maximum of 516.7 km for Grassholm SPA, Woodward *et al.* 2019) and has a high habitat flexibility (Furness & Wade 2012), suggesting that displaced birds can readily find alternative habitats including foraging areas. Therefore, it is unlikely that in-combination displacement mortality

rates would reach the upper range of 1-10% mortality previously advised by NRW (A) and is more likely to be at the lower end of the range. Therefore, we are content that the Applicant has considered a range of 60-80% displacement and 1% mortality in REP3-058.

58. Based on REP3-058, Table 3.19-3.21, a WCS of 80% displacement and 1% mortality results in 0 gannet mortalities from displacement) and 0.00 gannet collisions per annum are apportioned to the SPA from the projects alone. Hence 0 mortalities from collision plus displacement from the project alone are apportioned to the SPA. Therefore, we agree with the Applicant that there would be no AEOSI for predicted displacement, collision and collision plus displacement impacts on the gannet feature of the Grassholm SPA from the project alone.

1.4.2.3.2. In-Combination Impacts

59. The Applicant has not undertaken an in-combination assessment for Grassholm SPA gannets as the predicted impact from the project alone does not exceed 0.1% of baseline mortality, which is the threshold the Applicant has used for screening whether impacts are taken through to in-combination.

60. Since the Morecambe Generation Assets project contribution to the in-combination collision plus displacement total is predicted to be 0 gannet mortalities per annum at a WCS (80% displacement and 1% mortality, plus collisions), is unlikely to contribute to the in-combination total. **Therefore, we consider there would be no AEOSI on the gannet feature of the Grassholm SPA for predicted displacement, collision and collision plus displacement impacts from the project in-combination with other plans and projects.**

1.4.2.4. Liverpool Bay SPA

61. With regard to little gull at Liverpool Bay SPA, as noted in our Written Representations [REP1-099] and in our Deadline 3 submission [REP3-094], given that the Morecambe Generation Assets project is located wholly in English waters, we defer comment/advice regarding predicted impacts and integrity judgements of the project alone and in-combination for all qualifying features of the Liverpool Bay SPA to Natural England, this includes the little gull, red-throated diver and common scoter features.

1.5. Habitats Regulations Assessment Without Prejudice Derogation Case – Red-throated Diver at Liverpool Bay/Bar Lerpwl SPA [REP3-064]

62. As noted in NRW (A)'s Written Representations [REP1-099] and Deadline 3 submission [REP3-094], since the Morecambe Generation Assets project is located wholly in English waters, we defer comment/advice regarding Liverpool Bay SPA to Natural England. Therefore, we also defer advice on the red-throated diver derogation case for this SPA set out in REP3-064 to NE.

1.6. Outline Compensation Implementation and Monitoring Plan – Red-throated Diver [REP3-065]

63. Consistent with advice on the Liverpool Bay SPA red-throated diver derogation case [REP3-064], we defer advice on the red-throated diver outline compensation implementation and monitoring plan as set out in REP3-065 to NE.

2. Marine Mammals

Marine Mammal Comments on the Applicant's submissions at Deadline 3

Key issues

64. Update to the Joint Position Statement on UXO Clearance, and Publication of Marine Noise Policy which requires the use of noise abatement systems (**Key Issue 1**)
65. NRW (A) do not fully agree with the approach taken by the applicant in the cumulative assessment (CEA) and in-combination assessment, and do not agree that the additional information submitted at Deadline 3 is sufficient to justify this approach (**Key issue 2**).

Detailed Comments

2.1. Update to the Joint Position Statement on UXO Clearance, and Publication of Marine Noise Policy which requires the use of noise abatement systems (Key Issue 1)

66. NRW was previously a signatory to the 2022 Joint Interim Position Statement on UXO Clearance and until 21st January 2025, the hierarchical approach taken by the applicant for UXO clearance had been sufficient.
67. We highlight that an update to the [Join Position Statement on UXO clearance](#) (which NRW contributed to and has endorsed) was published on 21st January 2025. The new statement requires low noise methods of clearance to be the default method, and that high order clearance should only be used in exceptional circumstances. This statement should be considered when developing mitigation plans to accompany marine licence applications.
68. The Department for Environment, Food & Rural Affairs (DEFRA) have also published a [Marine Noise Policy](#) (21st January 2025). This includes expectations that from January 2025 onwards, it is expected that all offshore wind pile driving activity in English waters will be required to demonstrate they have utilised best endeavours to deliver noise reductions using primary and/or secondary noise mitigation methods in the first instance. Primary methods aim to reduce noise emissions at the source through modifications of the piling process (for example,

alternative hammer types, alternative foundation types). Secondary methods aim to reduce the noise propagated through the water column during pile driving by employing systems such as casings, resonators, and bubble curtains. NRW (A) notes that the Outline Underwater Sound Management Strategy submitted by The Applicant at Deadline 3 does not currently address the need for additional mitigation measures. The UWSMS should contain a commitment to the use of Noise Abatement Systems to mitigate residual impacts.

2.2. Marine Mammal Technical Note 1 (EIA) - Revision 02 (Volume 9) [REP3-060: clean/ REP3-061 tracked] and Marine Mammal Technical Note 2 (HRA) - Revision 02 (Volume 9) [REP3-062: clean/ REP3-062 tracked]

2.2.1. Marine Mammals Technical Note 1 (EIA), paragraph 2; Marine Mammals Technical Note (EIA), - 2.7 Clarification on disturbance assessments (NE Ref D4 & D28)

69. The applicant states that: *“For population modelling, if there is a continued decline of >1% per year (versus a modelled unimpacted reference population) over a set period of time (e.g. the first 6 years, based on the former Favourable Conservation Status reporting period), then there is a high likelihood that there is a significant level of effect (NRW, 2023)”*. NRW(A) draws the Applicant’s attention that the threshold described in NRW (2023) is intended solely for assessing the impacts of auditory injury from Permanent Threshold Shift (PTS) on a population. It should not be used as a reference to support the threshold for assessing the impacts of disturbance.
70. While NRW(A) has used the quoted threshold in its advice to recommend it as one possible method to determine the significance of behavioural disturbance on a population based on the outputs of Interim Population Consequences of Disturbance (IPCoD), there is currently no published guidance or position statement. Such guidance remains under development and may change. The Applicant should amend any such references to NRW (2023).

2.2.2. Marine Mammal Technical Note 1 (EIA) - Revision 02 (Volume 9) [REP3-060: clean/ REP3-061 tracked] - 2.7.1 Clarifications to the Project-alone assessment

71. NRW (A) draw the applicant’s attention to the fact that the PrePARED report (Benhemma le-Gall et al. 2024) was very clear on the limitations of the data, and the extent of how representative they could be outside of Moray Firth. The report limited itself to clearly stating that:
- a) The Effective Deterrent Radius (EDR) of < 10 km was only valid for the data collected in that area,
 - b) The calculated EDR of < 10 km was not intended as a suggested option with which to replace the current 26 km EDR, but only to help make a case for revising it,

c) The additional work needed for point (b).

72. Currently, JNCC are conducting a review of the piling noise EDRs which will include re-analysis of available data, including the data collected from PrePARED in addition to unpublished data from the same project that was not used in the 2024 report. NRW (A) strongly recommends that the findings of a single report based on limited data should **not be** applied outside of their intended context

**2.2.3. Marine Mammals Technical Note (EIA) - Revision 02 (Volume 9)
[REP3-060 clean/ REP3-061 tracked] - 2.6.2 Clarifications to
cumulative effects from underwater noise due to piling**

73. The applicant has assessed the cumulative effects of piling noise for both auditory injury/Permanent Threshold Shift (PTS) and disturbance together. While the outputs of this assessment are welcomed and help inform the assessment considerably, NRW (A) notes that NRW (2023) recommends that when assessing auditory injury/PTS, the numbers injured should be assessed independently of disturbance.

**2.2.4. Marine Mammals Technical Note (EIA) - Revision 02 (Volume 9)
[REP3-060 clean/ REP3-061 tracked] - 2.7.2 Clarifications to
cumulative effects from underwater noise due to piling**

74. NRW (A) note that here, the Applicant has based their quantified assessments on an absolute (and therefore unrealistic) worst-case scenario based on numbers disturbed from a single day of piling, assuming all projects carried out piling on the same day. Consequently, this has led to unrealistically high numbers of animals disturbed, leading to the iPCoD results being prioritised. At this stage of the examination, we do not expect the Applicant to complete a reassessment, however for future assessments, NRW (A) recommends that this is an unsuitable approach. NRW (A) advise that when comparing two different methodologies to inform an assessment, these should be based on similar scenarios (which take into account assumed piling schedules and timetables – as can be done in iPCoD) for such a comparison to be both meaningful and valid.

**2.2.5. Marine Mammals Technical Note (EIA), - Revision 02 (Volume 9)
[REP3-060 clean/ REP3-061 tracked] - 2.8 Cumulative effects from
underwater noise from all noisy activities**

75. While NRW (A) welcome the additional information provided by the Applicant which includes all construction activities, the assessment simply assumes the highly unrealistic scenario where all activities are assumed to occur at the same time (as per previous NRW (A) comments a simultaneous assessment as opposed to a cumulative assessment). Thus, conclusions made are of limited value being based on unrealistically and disproportionately high numbers for a single day of offshore construction. Ideally, such a cumulative assessment would assess the impacts across the lifetime of these projects, using a realistic schedule of the activities that might occur.

**2.2.6. Marine Mammals Technical Note (EIA), - Revision 02 (Volume 9)
[REP3-060 clean/ REP3-061 tracked] - 3.0 Updates and amendments
to the Marine Mammal Assessment (Chapter 11 Marine Mammals
(APP-048)) following NRW Written Representations (Key Issue 2)**

76. The below comments also refer to NRW (A) Written Representations [REP1-099] and follow up discussions with the Applicant namely, WR-099-61 WR-099-65, WR-099-66, WR-099-67, WR-099-69, WR-099-70, WR-099-76, WR-099-78.

77. NRW (A) welcome the provision of the updated marine mammals technical notes (EIA and HRA). However, in our view these do not sufficiently justify the approaches taken in the CEA and in combination assessment. It is essential to revise the assessment so that future projects using the Morecambe Offshore Windfarm ES application have access to accurate information.

78. In the original application, the Applicant adopted an approach to the CEA and in-combination assessments, which, in our view, significantly underestimates the numbers disturbed and the significance of the effect:

- a) For the project alone, separate assessments (and therefore separate conclusions of significance/adverse effect) were provided for the different phases of the project: construction vs operation and maintenance phase.
- b) The applicant screened out underwater noise from OWFs maintenance and decommissioning activities by arguing that the impact footprint from the construction phase will exceed that of the operational and decommissioning phases, thereby inclusion is unnecessary. However, whilst the construction phase has a larger impact footprint, this approach does not account for the additional, largely chronic, impact load of the operational and decommissioning phases of other projects. Therefore, there is a risk that the resulting CEA / in-combination assessments are under precautionary.
- c) Separate assessment conclusions were made for different impact pathways in-combination. While the CEA /in-combination assessment evaluated the impact pathways for all screened in projects, it did not assess the total impact of all pathways for all projects collectively.
- d) Other than disturbance from piling noise (where multiple piling days across multiple projects within the same management unit was assessed and modelled), assessments were based on numbers disturbed by a single event of a given activity. As a result:
 - I. The potential cumulative impact of repeated disturbance events on the same population over time was not captured or assessed,
 - II. Statements that x% of an Management Unit (MU) population would be disturbed, and that the impact was therefore small, were incorrect since the total over the project lifetime would be higher,
 - III. Without expressly stating that numbers of animals disturbed were based on a snapshot at a single point in time, future projects using the Morecambe Offshore Windfarm Environmental Statement application would not have access to the correct numbers disturbed.

- e) With the exception of disturbance from piling noise assessments, the overall approach taken by the applicant was to present a worst-case scenario snapshot of animals that may be disturbed simultaneously at any given time by the project and other OWFs. In our view, this constitutes a simultaneous assessment rather than a cumulative one.
- f) The applicant screened out activities based on piling overlap, assuming that there will be no days where, piling does not occur, but other activities do over the lifetime of the project. Additionally, they assumed all disturbed animals would be displaced from the area, ruling out the possibility that the impact radii for different pathways, and/or different projects, might overlap with the same population, potentially causing additive impacts.
- g) The conclusions on disturbance from vessel noise in paragraph 11.736 [APP-048] were based on estimates of numbers of animals disturbed at a single point in time. This approach does not adequately capture the overall additional disturbance introduced by repeated disturbance events over the different project phases. Whilst disturbance from vessel noise is relatively short-lived, recovery from a single disturbance event does not imply that:
 - I. There is no cost to the animal during the recovery process (e.g., loss of feeding opportunities or decreased energy stores).
 - II. Repeated episodes of disturbance would not have an effect due to multiple vessel trips in the area.
- h) The applicant also screened out all aggregate extraction and dredging projects within the Celtic and Irish Seas Management Unit (CIS MU), arguing that the localised and short-to-medium term behavioural reactions justifies the omission. NRW(A) argues that the applicant may be overlooking individually smaller impact pathways, that despite limited scale, could increase the stressor load on the same MU population, potentially causing an additive effect.

79. Overall, NRW (A)'s opinion is that the original CEA and in-combination assessments assessed the cumulative impact of piling noise from multiple projects, but did not adequately assess this for all other impact pathways, or the combined total impact of all projects from all impact pathways.

80. At Deadline 3, the Applicant provided further information and analysis in response to Natural England's (NE) and NRW (A)'s written representations within the updated EIA Technical Note 1 (Sections 2.0 and 3.0, respectively [REP3-060 clean/ REP3-061 tracked]). Overall NRW (A) do not agree with the approach taken in the CEA and in-combination assessment, and do not consider that the additional information submitted at Deadline 3 is sufficient to justify this approach. NRW (A) provide further detailed comments below, with references to the specific sections of the relevant reports.

2.2.6.1. Section 3.1.1 Additive effects [REP3-060 clean/ REP3-061 tracked]

81. As per our comments in Section 2.2.5 above, we welcome the additional information provided by the Applicant and inclusion of all construction activities. However, the assessment assumes the unrealistic scenario where all activities are

assumed to occur simultaneously, as opposed to a cumulative assessment. Thus, the conclusions of limited value and validity as they are based on unrealistic and disproportionately high numbers for a single day of offshore construction. A cumulative assessment should assess the impacts across the entire project lifetime, using a realistic schedule of activities.

82. In Paragraph 128, the Applicant argues that the potential for spatially (additive) effects is minimal, as animals disturbed by louder, more significant noise (presumably piling noise) will have already vacated the area, thereby reducing the impact of subsequent, less intense activities. However, this argument appears to be fundamentally based on a number of inaccuracies / incorrect CEA methodology:

a) Dose-response curve data from piling noise for harbour porpoise and harbour seal indicates that piling does not lead to a 100% displacement rate of animals within the ensonified area. Even if we assume that all responses observed were displacement (as opposed to, for example, cessation of vocalisation while the animal remained in the area), the assumption that *“animals disturbed by louder more significant noise will have already vacated the area”* is incorrect as there would still be a substantial number of animals in the area.

b) A CEA /in-combination assessment is carried out at a population-level scale. Even assuming a 100% displacement rate, unless the area vacated is equivalent to the size of the management unit / screening area, the possibility of additive impacts from multiple projects cannot be ruled out.

c) Given vessel availability and the varying stages of the consenting process across different projects, it is likely that while piling may be occurring in one or more projects, other non-piling activities would be taking place elsewhere. Furthermore, the number of piling days required for each project is finite, as it depends on the number of turbines. If projects are within the same MU and impact the same population, an additive effect has occurred and needs to be considered.

83. The Applicant concludes that due to the intervals between activities, it is not anticipated that this would result in effects of greater significance than those from individual impacts considered in isolation but provides no evidence to underpin this claim.

2.2.6.2. Section 3.1.3 Shipping [REP3-060 clean/ REP3-061 tracked]

84. NRW (A) confirms that no concerns were raised with regard to collision (paragraphs 156 – 159). We welcome the additional information provided by the applicant.

85. Our primary reason for raising written representations WR-099-70 and WR-099-78 was to ensure that the contribution of the transmission assets to the overall impact was not overlooked. The number of animals affected should be included into the overall assessment of any project, despite (as expected) being proportionally small. We caution against assuming that a proportionally small effect can be “rounded down” to zero effect, and screened out before the assessment, as the

combined effect of multiple individually “negligible” or “minor” impacts is likely to be larger than “negligible” or “minor”.

86. NRW(A) assumes that the estimated number of disturbed animals reflect a single point in time, rather than the total across the project lifetime. Estimates of numbers of animals disturbed at a single point in time do not adequately capture the overall additional disturbance introduced by repeated disturbance events over the different phases of the project. Therefore, we do not agree with the numbers proposed in paragraph 164, and the applicant’s conclusions of “negligible” significance for the transmission assets.

87. Whilst disturbance from vessel noise is relatively short lived, recovery from a single disturbance event does not imply that:

- a) There is no cost to the animal during the recovery process (e.g. loss of feeding opportunities / decreased energy stores).
- b) There would be no effect from repeated episodes of disturbance as a result of there being multiple vessel trips in the area.

88. Harbour porpoise are known to respond to vessel noise by increasing swimming effort, making deeper dives, and ceasing echolocation and foraging for several minutes (Dyndo et al 2015; Wisniewska et al 2018) and potentially reducing their daily net energy gain (Rojano-Doñate et al 2023). Wisniewska et al (2018) further noted that *“although these individuals lived in highly trafficked coastal waters, they did not seem to have habituated to vessel noise”*. Similar findings were made for other species by Pirodda et al (2013, 2015), Oakley et al (2017), Marley et al (2017a, 2017b). Within acoustically degraded habitats, it is also possible that animals need to make trade-offs between the benefits of remaining and taking advantage of important resources while tolerating disturbance, and the physiological and energetic costs of relocation (e.g. Hastie et al 2021; Findlay et al 2024).

89. The Applicant does not provide justification for the statement that for vessel noise *“across the project lifetime, the effects on marine mammal receptors are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.”*

90. The Applicant suggests that *“vessel routes to and from offshore windfarms and other offshore projects will, for the majority of trips, use existing vessel routes for pre-existing vessel traffic which marine mammals will be accustomed to. They may also have become habituated to the volume of regular vessel movements and therefore the additional risk would predominantly be confined to the array area.”* Given the considerable amount of data required to justify a conclusion of “habituation” NRW (A) contend that this point is speculative. As noted above, it is likely that animals are making trade-offs between the benefits of remaining and taking advantage of important resources while tolerating disturbance, and the physiological and energetic costs of relocation (e.g. Hastie et al 2021; Findlay et al 2024).

91. In paragraph 181, the applicant adopts a 100 km screening distance without providing a justification. This screening distance is smaller than the MU for most of

the species scoped into the assessment; the purpose of the cumulative assessment being to assess the impacts of a given pathway on the MU population, individually and in conjunction with one another.

92. Finally, the magnitude of disturbance in Section 3.1.3.2 appears to have been based on the number of vessel transfers as opposed to the number of animals disturbed.

2.2.6.3. Section 3.1.4 Cumulative effect of repeated disturbance events [REP3-060 clean/ REP3-061 tracked]

93. NRW(A) disagrees with the Applicant that the issues raised in our written representation's WR-099-61 [REP2-027] have been addressed. Our concerns remain, that the assessment conclusions were based on the number of animals disturbed by a single event of a given activity.
94. While we have no major concerns regarding certain sources that are either continuous but low level (e.g., operational turbine events), or rare (e.g., UXO detonation), we are concerned that for several particular noise sources carried out over consecutive days from a moving source, including geophysical surveys, other construction activities, vessel noise, the conclusions are based on the numbers disturbed at any one time.
95. This approach does not adequately capture the overall additional disturbance introduced by repeated disturbance events over the different project phases. While we acknowledge that disturbance from vessel noise is relatively short lived, the fact that an animal recovers sometime after a disturbance event, does not mean the event should no longer be counted as disturbance. If the intent is to calculate the number of animals disturbed, basing the assessment, either for the project alone and/or the CEA, on a snapshot estimate risks significant underestimation. This is particularly the case when making conclusions of magnitude based on statements that "x% of the MU population was disturbed" as the total numbers disturbed over the project lifetime would be higher.
96. NRW (A) are concerned that there is a risk that impact pathways, which consist of chronic disturbance events but have an individually relatively small effect, are being overlooked due to short-lived nature of individual disturbance events. We advise that it is important to consider the overall additional stressor load introduced when making a conclusion on the magnitude of an impact pathway.
97. We highlight that the latest version of the DEPONS model for simulating population effects of noise for harbour porpoises (V3.0) now makes it possible to simulate the population impact of noise from ships through the SATURN and work ongoing (e.g. Schnitzler et. al., 2024). Additionally, work to develop the Dynamic Energy Budget (DEB) models for their eventual inclusion into the iPCoD framework is ongoing (Harwood et al 2022). As per NRW's written representation WR-099-68 [REP2-027], and as acknowledged by the Applicant in their responses, King et al. (2015) also suggested that other impact pathways, such as noise from seismic surveys and/or vessels, can be included into iPCoD by estimating the number of animals disturbed by these activities and the duration and spatial extent.

98. While, as per prior submissions and discussions with Applicant, the suggestion in King et al. (2015) was chiefly conceptual in nature, suggesting that iPCoD could model population effects from other sources given adequate parameterisation. The key takeaway is that the scientific community already recognises that for repeated noise events, where the effect may be individually small (e.g., passage of one vessel), it is plausible that the cumulative impact may be greater than the impact from a single disturbance event.
99. Although methods to quantify the effects of repeated disturbance events are still developing, this does not mean that total numbers disturbed from repeated events should not be considered on a qualitative basis when determining the magnitude of an impact. It is not sufficient to argue, as the Applicant has done here, that an impact is “reversible / recoverable” or “short lived / temporary”, as in the process of recovering from the disturbance event and returning to its previous state the animal may have incurred some cost.

2.2.6.4. Section 3.1.6. Residual PTS [REP3-060 clean/ REP3-061 tracked]

100. In our written representation, NRW (A) argued that permanent threshold shift (PTS) should not be screened out of the CEA, as the Applicant’s approach relied on post-consent mitigation, which we consider to be insufficient to rule out any residual impacts. We refer the Applicant to the recent publication of DEFRA’s Marine Noise Policy for further guidance.

2.2.6.5. Section 3.1.7. Additional impact load: operation and decommissioning [REP3-060 clean/ REP3-061 tracked]

101. While NRW (A) does not dispute the conclusions regarding the individual pathways assessed here, our concerns in WR-099-76 and WR-099-77 [REP2-027] focused on the added stressor load introduced in addition to the construction phase. The Applicant has assessed the individual pathways for the operation and decommissioning phases and compared them to the construction phase but has not looked into the cumulative stressor load on the MU population from the presence of a long-term project.

2.2.7. Marine Mammal Technical Note 2 (HRA), - Revision 02 (Volume 9) [REP3-062 clean/ REP3-063] - Section 3.1 Additional information to the in-combination assessment (Key Issue 2)

102. While we welcome the additional information provided, we do not fully agree with Paragraph 79 of the Marine Mammals Technical Note (HRA) Please refer to our response for Sections 2.2.6, and 2.2.5 of the Marine Mammals Technical Note (EIA) above in the relevant sections.

2.3. Additional Comments

103. **WR-099-51:** At Deadline 3, NRW(A) advised again that mitigation methods recommended via the Offshore Renewables Joint Industry Programme’s (ORJIP) Range dependent nature of impulsive noise (RaDIN) project is included as a

mitigation option within the final Under Water Sound Management Strategy (UWSMS) and Marine Mammals Management Plan (MMMP). As of Deadline 3, the UWSMS and MMMP have not been updated to include or acknowledge this mitigation option.

104. **WR-099-52:** At Deadline 3 NRW (A) commented: *“NRW (A) acknowledge and welcome the changes made to the chapter in the Vessel Traffic Management Plan (VTMP) [APP-153]. We seek confirmation that these measures essentially match those in the WiSe scheme.”* No further revisions to Section 7.1 of the updated VTMP suggest updates to confirm that the measures are essentially the same as those in the WiSE Scheme.
105. **WR-099-57:** In NRW (A)'s written representations, we raised concerns about potential over-reliance on Acoustic Deterrent Devices (ADD's) to reduce auditory injury (PTS), our concern being that in an effort to mitigate for and prevent PTS incidents, there is a risk that ADDs may be used at too powerful a setting to ensure that the area is cleared – potentially effectively shifting the impact pathway to disturbance via strong behavioural and physiological responses at ranges of several kilometres.
106. In response to this, the Applicant recognised this risk and stated that the duration and potential effect of the use of the ADD will be further considered post-consent in the final UWSMS, MMMP and European Protected Species (EPS) licence with consultation based on the most up to date available information.
107. However, NRW (A) note that as of Deadline 3, no revisions to the MMMP or UWSMS have been made to state that that they *“will consider carefully the ADD duration to balance the risk of injury with any potential further disturbance from the ADD itself to ensure a proportionate and judicious application.”*
108. **WR-099-59:** At Deadline 3, NRW(A) responded that our query had not been addressed in relation to quantification of impacts from vessel noise. NRW (A) advised that the Applicant clarify whether the method used assumed that: (1) disturbed animals will leave the area; and/or (2) no new animals will be disturbed (or repeatedly disturbed) other than those within the 285.4 km² area. As of Deadline 4 this query is pending.
109. **WR-099-66:** NRW (A) commented that separate cumulative assessments have been provided for each of the different impact pathways, with individual cumulative assessment conclusions for each. The impacts of these separate assessments do not appear to have been summed/considered in the same model, thus the impact of multiple pathways of disturbance on the same populations has not been captured. While effects of these impacts acting in concert may not necessarily be additive, no justification has been provided to support this assumption. The Applicant has partly addressed this issue in separate sections of their Deadline 3 submission. Please refer to our response above to Section 2.8 and 3.1.1 of the updated Technical Note in the Sections 2.2.62.2.5 and 2.2.6.
110. **WR-099-67:** NRW (A) noted that in paragraph 11.796 [APP-048] the Applicant has screened out any activities based on piling overlap. This appears to assume that there will be no days where, for instance, piling does not occur, but other

activities do. It further assumes that all animals disturbed will be displaced from the area, ruling out the possibility that impact radii for different pathways may overlap, with potentially additive impacts. As of deadline 4, this issue has not been addressed directly in the updated Technical Note.

111. **WR-099-70:** Please refer to our response above in the Section 2.2.6.
112. **WR-099-72:** The Applicant has provided additional information in Section 3.1.2 of the updated Technical Note. We consider this issue closed.
113. **WR-099-75:** NRW (A) note that the Applicant has incorporated an assessment on PTS from other OWF projects into the cumulative disturbance assessment using iPCoD in Marine Mammals Technical Note (EIA) - Revision 02 (Volume 9) [REP3-060 clean/ REP3-061 tracked] Section 2.6.2. While the outputs of this assessment are welcomed and help inform the assessment considerably, NRW(A) notes that NRW (2023) recommends that when assessing auditory injury (PTS), the numbers injured should be assessed independently of disturbance. We can confirm that no further amendments are required and consider this issue closed.
114. **WR-099-76:** The Applicant has provided additional information in Marine Mammals Technical Note (EIA) - Revision 02 (Volume 9) [REP3-060 clean/ REP3-061 tracked] Section 3.1.7. Please refer to our response above in the Section 2.2.6.
115. **WR-099-78:** The Applicant has provided additional information in Marine Mammals Technical Note (EIA) - Revision 02 (Volume 9) [REP3-060 clean/ REP3-061 tracked] Section 3.1.3. Please refer to our response above in the Section 2.2.6.
116. **WR-099-82:** While NRW (A) welcome the additional information provided, we do not fully agree with Marine Mammal Technical Note 2 (HRA) - Revision 02 (Volume 9) [REP3-062: clean/ REP3-062 tracked] paragraph 79. Please refer to our response for sections 3.0, and 2.8 of the Marine Mammals Technical Note (EIA) above in Sections 2.2.6.2.5 and 2.2.6.

2.4. In Principle Monitoring Plan - Revision 02 (Volume 6) [REP3-045 clean/ REP3-046-tracked] - Table 2.3

117. NRW(A) welcomes the monitoring options proposed by The Applicant in Table 2.3. We can confirm that there are no issues with the options proposed, and that as per our previous responses NRW (A) may be able to agree that no monitoring may be required from a consenting perspective, however any additional data collection carried out by the applicant would be welcome.

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