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Your ref: EN010053



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VIA EMAIL ONLY

Dear Giles Scott,

Planning Act 2008 (as amended) and The Infrastructure Planning (Examination Procedure) Rules 2010 (as amended) – Application by SMart Wind Limited for an Order Granting Development Consent for the Hornsea Offshore Wind Farm (Zone 4) – Project Two.

Request for comments from Natural England and the Joint Nature Conservation Committee on the application for the proposed Hornsea Two offshore wind farm – EN010053

Thank you for your letter dated 28 April 2016. The following constitutes the Joint Nature Conservation Committee (JNCC) and Natural England's formal statutory response.

The consultation for the Southern North Sea (SNS) possible Special Area of Conservation (pSAC) commenced on the 19th January 2016. At this point, the site became a material consideration and Habitat Regulations Assessments (HRA) being undertaken by Competent Authorities now need to take account of the site's Conservation Objectives (COs), which are:

To avoid deterioration of the habitats of the harbour porpoise or significant disturbance to the harbour porpoise, thus ensuring that the integrity of the site is maintained and the site makes an appropriate contribution to maintaining Favourable Conservation Status for the UK harbour porpoise. To ensure for harbour porpoise that, subject to natural change, the following attributes are maintained or restored in the long term:

1. *The species is a viable component of the site;*
2. *There is no significant disturbance of the species; and*
3. *The supporting habitats and processes relevant to harbour porpoises and their prey are maintained.*

Natural England and JNCC advise that there will be a likely significant effect on the SNS pSAC, and that accordingly an Appropriate Assessment is required. With regards to Hornsea Project 2 the issue under consideration is CO 2 above, concerning significant disturbance, in terms of an adverse effect on the integrity of the pSAC alone and in combination with other plans or projects. In terms of disturbance, the key impact for the Hornsea Project 2 HRA to assess is underwater impulsive noise within the SNS pSAC.

Natural England and JNCC have provided comments regarding the Applicant's '*Appendix A to the Response submitted for 21 April 2016*'¹. In addition Natural England and JNCC set out what the uncertainties are regarding the assessment, and how they should be considered by the Secretary of State when making her decision.

¹ <http://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN010053/2.%20Post-Submission/DECC%20Consultation/Dong%20-%20Hornsea%20Project%202.pdf>

Natural England and JNCC's Detailed Advice

Ecological Overview

It is well known that porpoise are sensitive to impulsive noise from activities such as pile driving. Studies have shown that porpoises will be displaced from the area around pile driving activities with studies indicating that porpoises react to pile driving events to distances of tens of km from the piling site (e.g. Brandt et al., 2009; Dähne et al., 2013; Tougaard et al., 2009). However, while 100% of porpoises are displaced from a small area around the pile driving site, both Brandt et al., (2011) and Dahne et al., (2013) have shown that the percentage of porpoise displaced decreases with distance from the site, out to approximately 50 km. It has also been shown that porpoise return to the site hours to days after the noise has ceased (Tougaard et al., 2006; Teilmann et al., 2006; Brandt et al., 2011; Dahne et al., 2013), however, Dahne et al., (2013) further reported that longer pile driving durations led to a longer displacement from the site. Studies have also documented harbour porpoise presence in operational wind farms (Polanen et al., 2010), sometimes in higher numbers than in reference areas (Scheidat et al., 2011), providing more confidence that porpoise do generally return to a site post pile driving. However, this may not always be the case. Whilst most published studies have shown that porpoises return to the area soon after piling has ceased, one study (Teilmann and Carstensen, 2012) reported that porpoise abundance had not returned to pre-construction levels ten years after the wind farm had been constructed. In addition, whilst the immediate effect on porpoise distribution is more readily observable, there is great uncertainty regarding the effect that disturbance, particularly the effect of displacement away from high quality habitats, may have in the longer term on individuals' survival and fertility

The presence of persistent higher densities of porpoise in the SNS pSAC has been attributed to the assumed availability of good foraging habitat, therefore there is a presumed drive for porpoises to return to the pSAC post pile driving. However, it should be noted that the literature reporting porpoise return times post pile driving is, for the most part, on isolated wind farms, using smaller piles and smaller hammer energies than is being predicted for Round 3 wind farms including Hornsea Project 2. It is uncertain whether there would be a different response by porpoise to these larger (and possibly noisier) developments, and whether the return time to the pSAC would be similar to that reported in the literature or take a longer period of time.

In terms of addressing this uncertainty going forward, Natural England notes the DCO condition requiring a marine mammal monitoring plan to be produced. It would therefore be appropriate that this plan include monitoring during the construction phase of the Hornsea 2 project, in order to monitor return times of porpoise post piling. Natural England notes however that this monitoring should not be taken into account in the SoS's consideration of impacts on the integrity of the pSAC - this monitoring would only be appropriate if the SoS determines that the project will have no adverse impact on the site, or that any adverse impact can be mitigated appropriately.

Additionally, Natural England and JNCC note that there is uncertainty regarding noise propagation and harbour porpoise reactions to sub-bottom profilers, though we acknowledge that the applicant has used what limited evidence there is available (modelled, not empirical) when quantifying the impacts of this aspect of the proposal. However, we would note that behavioural responses in the referenced paper were predicted to begin between 500 m and 4.5 km away from the source and these distances would be more appropriate to use, rather than the values for injury presented by the applicant. In addition, the modelling was undertaken for water depths of 3 and 30 m, and propagation is likely to be greater for the Hornsea 2 project water depths.

The applicant's assessment of the project alone

The Statutory Nature Conservation Bodies (SNCBs) are exploring options and developing guidance to define what can be considered as a significant disturbance to help inform the assessment of adverse effect on the pSAC. The applicant has used the parameters suggested as a basis for exploratory discussions with industry and regulators in workshops earlier in 2016 to assess the impact of their project on the pSAC. It should be noted that casework guidance for the pSAC is subject to ongoing discussions amongst the SNCBs, and requires further development and consultation with stakeholders before the SNCBs can provide formal casework guidance to competent authorities. However, given

that these potential parameters have been presented to developers it is understandable that the applicant has explored them in the context of their proposal.

Nevertheless, Natural England and JNCC advise that the Secretary of State should assess the Hornsea Project 2 Application against the site's draft Conservation Objectives (detailed above) rather than these parameters.

It is Natural England and JNCC's view that the applicant has done all it can with the evidence currently available in terms of assessing effects from their project alone. However, as set out above, there are a number of uncertainties that remain within the assessment.

The applicant's in-combination assessment

The impact of Hornsea Project 2 wind farm has to be considered in combination with other wind farms (i.e. projects under construction but not completed, projects authorised but not yet started, in the consenting process, etc) and other noise sources known to lead to disturbance (e.g. seismic surveys), which may combine to impact the Southern North Sea pSAC.

The developer states that it is not currently possible to undertake a realistic assessment of the in-combination impacts due to uncertainties in the other offshore wind farm projects that will go forward and their choice of build option. In their submission, the developer has tried to assess the impact with available information from East Anglia ONE as well as considered the impact with the worst case development in the summer part² of the pSAC site (Dogger Creyke Beck A and B). However, Natural England and JNCC do not consider this to be a complete in-combination assessment. While Natural England and JNCC agree that a realistic in-combination assessment is currently challenging, this also means that it is not possible at this time to ascertain beyond reasonable doubt that there will be no adverse effect of the project in-combination with other plans and projects.

In addition, the applicant considers potential overlaps (e.g. concurrent piling) only within the time frame of the construction of the proposed wind farm. We advise that an HRA needs to consider a longer timeframe, particularly given the likelihood that there will be construction of wind farms within the site for several years and any assessment of significant disturbance needs to be taken in that context.

The Habitats Regulations state that an Appropriate Assessment must be full and include an assessment of in-combination impacts. If those in-combination impacts are unknown or unclear at this time then an assessment must be based on best available information. In this instance this should be based on the worst case scenario included in the Environmental Statements (ES) for other offshore wind farms and any more realistic scenarios presented either in the ES or that can be reasonably predicted. Natural England and JNCC therefore advise that DECC carry out a more detailed analysis of in-combination effects in order to properly characterise the potential impacts, using the signposting provided in the applicant's submission to sections of their ES and identifying any other relevant projects for inclusion. We advise that DECC should map the planned piling both temporally and spatially, quantifying the potential % of the pSAC that could be exposed to disturbance effects and the potential duration of that disturbance, using ES predictions or any more realistic project-specific scenarios that have emerged subsequently.

Mitigation

Despite the uncertainties that remain within the assessment as detailed above, Natural England and JNCC advise that there are a range of mitigation measures available that could potentially reduce the noise footprint of the project to acceptable levels. These include seasonal restrictions to piling, scheduling of piling with respect to other developments, distribution of turbines within the consent envelope, use of alternative foundations to remove or reduce the need for piling, and potentially emerging technologies that reduce noise levels at source.

The applicant has recognised that mitigation may be required, and suggests a condition be placed on

² The DHI work (Heinänen and Skov, 2015), which formed the scientific base for the pSACs identified seasonal components to the pSACs.

the DCO/DML to ensure that mitigation is put in place to ensure no adverse effect on the site should this be required. We welcome this commitment to mitigating impacts on the pSAC. However, the applicant has not detailed all the available mitigation techniques (and their limitations) that could be considered in order to reduce noise levels and hence mitigate for disturbance. Natural England and JNCC note that a conclusion of no adverse effect on integrity can only be reached if the competent authority can be 'sure' or make 'certain' that there will be no adverse effects. The necessary certainty can potentially be gained if there are a range of viable measures secured in the DCO/DML that could be brought forward either on their own or part of a suite of measures if required. Without such assurance we do not think DECC will have sufficient certainty to conclude that an adverse effect on integrity can be avoided.

Natural England and JNCC therefore advise that a detailed strategy based on an assessment of the full range of mitigation measures potentially available to reduce disturbance, and a requirement to use them as necessary, should be secured in the DCO/DMLs through a requirement to produce a Southern North Sea pSAC Mitigation Strategy. This should be submitted to MMO at least four months before the development commences.

Natural England and JNCC have set out a recommended condition to the DCO/DMLs in Annex I. The intention of this condition is to secure the details of how the piling phase of the development will avoid adversely affecting the integrity of the SNS pSAC.

General Advice: Ongoing Strategic Assessment

Separately, Natural England and JNCC also recommend that DECC undertake a strategic HRA which should take into consideration the planned installation of all wind farms which may impact on the SNS pSAC, as well as other activities with the potential to disturb porpoise, such as geophysical surveys. This is of particular importance given the scale and number of activities planned to occur in and around the site in the forthcoming years and how this may result in cumulative effects on harbour porpoise in the pSAC. Natural England and JNCC recommend that this strategic HRA could be updated on a regular basis as the detailed installation plans become available and that the assessment that DECC Oil and Gas are undertaking for their sector could be used as a reference. Natural England and JNCC advisors would be available to meet with DECC colleagues to discuss possible approaches to the assessment at the earliest convenient date.

For any queries relating to the content of this letter please contact Emma Veryan at emma.veryan@naturalengland.org.uk.

Yours sincerely,

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References

Brandt MJ, Diederichs A, Nehls G (2009) Harbour porpoise responses to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. Final Report to DONG Energy, BioConsult SH, Husum, Germany.

Brandt, M. J., Diederichs, A., Betke, K and Nehls, G. (2011). Responses of harbour porpoises to pile driving at the Horns Rev II offshore wind farm in the Danish North Sea. *Marine Ecology Progress*

Series. **421**: pp. 205-216

Dähne, M., Gilles, A., Lucke, K., Peschko, V., Adler, S., Krügel, K., Sundermeyer, J., and Siebert, U. (2013). Effects of pile-driving on harbour porpoises (*Phocoena phocoena*) at the first offshore wind farm in Germany. *Environmental Research Letters*, **8(2)**: pp. 1-16.

Heinänen, S. and Skov, H. (2015). The identification of discrete and persistent areas of relatively high harbour porpoise density in the wider UK marine area. JNCC Report No: 544, Joint Nature Conservation Committee, Peterborough.

Polanen, P.T.V, Geelhoed, S. and Meesters, E. (2010). Harbour porpoise occurrence in relation to the Prinses Amalia windpark. Report number C177/10, IMARES, UR, Texel.

Scheidat, M., Tougaard, J., Brasseur, S., Carstensen, J., Van Polanen Petal, T., Teilmann, J. and Reijnders, P. (2011). Harbour porpoises (*Phocoena phocoena*) and wind farms: a case study in the Dutch North Sea. *Environmental research Letters*. **6(2)**: 10pp.

Teilmann, J., Tougaard, J. and Carstensen, J. (2006). Summary on Harbour Porpoise Monitoring 1999-2006 around Nysted and Horns Rev Offshore Wind Farms. (Denmark Ministry of the Environment, Trans.). National Environmental Research Institute, 14pp.

Teilmann, J. and Carstensen, J. (2012). Negative long term effects on harbour porpoises from a large scale offshore wind farm in the Baltic: evidence of slow recovery. *Environmental Research Letters*, **7(4)**: pp10.

Tougaard, J., Carstensen, J., Wisz, M.S., Teilmann, J., Bech, N.I. and Skov, H. (2006) harbour porpoises on Horns Reef in relation to construction and operation of Horns Rev Offshore Wind farm. Technical report to Elsam Engineering A/S. Roskilde, Denmark, National Environmental Research Institute.

Tougaard, J., Carstensen, J., Teilmann, J., Skov, H. and Rasmussen, P. (2009) Pile driving zone of responsiveness extends beyond 20 km for harbour porpoises (*Phocoena phocoena* (L)). *Journal of the Acoustical Society of America*, **126(1)**: pp.11-14.

Annex I: Proposed DCO/DML Condition

8.—(1) The licensed activities shall not commence until the following (insofar as relevant to that activity or phase of activity) have been submitted to and approved in writing by the MMO—...

(2) The licensed activities, or any phase of those activities, shall not commence until a Code of Construction Practice incorporating the following (insofar as relevant to that activity or phase of activity) has been submitted to and approved in writing by the MMO—...

(f) In the event that driven or part-driven pile foundations are proposed to be used, a detailed Southern North Sea possible SAC Mitigation Strategy to be approved in writing by the MMO, in consultation with Natural England and JNCC. The Southern North Sea possible SAC Mitigation Strategy will include, but is not limited to, the following potential mitigation measures, which following an assessment of their viability and efficacy in the plan would be deployed as required across the consented area or parts of it, either in isolation or as part of a package of measures:

- i) seasonal restrictions to piling;
- ii) scheduling of piling with respect to previous, ongoing and future piling associated with other offshore developments, based on an updated assessment of cumulative impacts;
- iii) distribution of turbines within the consented area;
- iv) use of alternative foundation methodologies, such as suction buckets;
- v) use of noise reduction at source technologies;
- vi) use of any other relevant technologies or methodologies that may emerge in the future.