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Subject:	Hornsea Project Three (UK) Ltd response to Deadline 3 (Part 7)
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Dear Kay, K-J

Please find attached the seventh instalment of documents.

Best regards,
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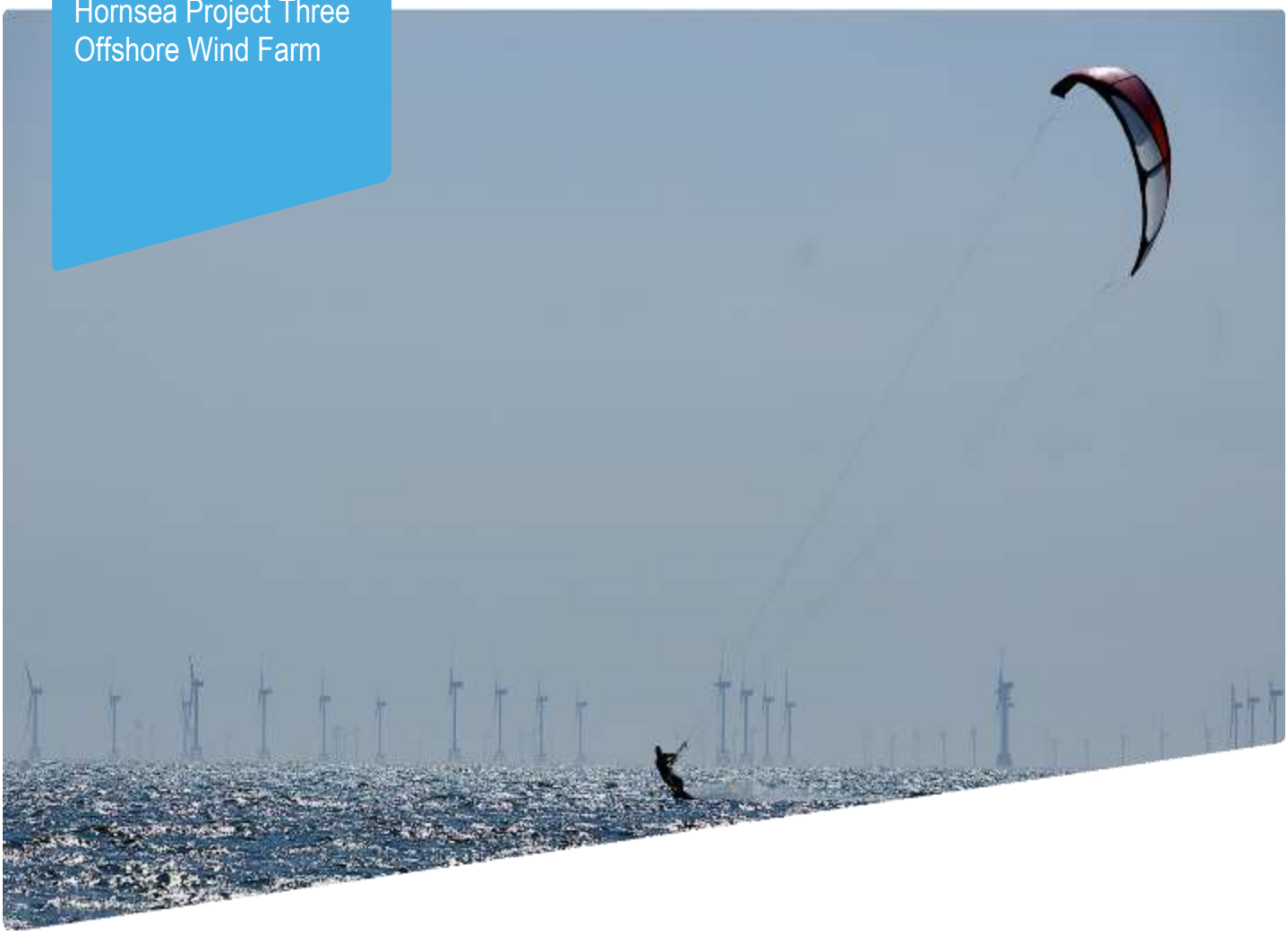
Hornsea Project Three
Offshore Wind Farm



Hornsea Project Three

Offshore Wind Farm

Appendix 14 to Deadline 3 Submission – Markham's Triangle pMCZ Lifetime Effects Assessment

Date: 14th December 2018

Hornsea 3
Offshore Wind Farm

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Front cover picture: Kite surfer near a UK offshore wind farm © Ørsted Hornsea Project Three (UK) Ltd., 2018.

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1. Introduction

1.1 In Annex D6 of Natural England's Written Representation (REP1-125), Natural England commented that they had difficulty understanding the total impact of the proposed operations in Markham's Triangle proposed Marine Conservation Zone (pMCZ) and suggested that the assessment sections be rewritten to provide a narrative of full and total impact throughout the lifetime of Hornsea Three. As outlined in the Applicant's Deadline 2 response to these comments (REP2-004), the Applicant's position remains that a comprehensive assessment of project lifetime effects within Markham's Triangle pMCZ has been undertaken and is clearly presented in both Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement (APP-104) and Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement (APP-062). The Applicant notes that whilst the assessments presented in Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement were undertaken on an impact by impact basis, consideration of repeat disturbance during the construction and operation and maintenance phase was presented and the Applicant would refer the Ex.A to the Applicant's response to Natural England's Relevant Representation (RR-097), as presented at Deadline 1 (REP1-131).

1.2 However, in order to assist, the Applicant agreed to submit a clarification to the Ex.A to summarise the assessment of impacts to Markham's Triangle pMCZ across the lifetime of the project for Deadline 3, in a similar manner as done in the Applicant's response to Q1.2.103 as submitted at Appendix 17 to the Applicant's response to Deadline 1 (REP1-178) for The Wash and North Norfolk Coast Special Area of Conservation (SAC) and the North Norfolk Sandbanks and Saturn Reef SAC.

1.3 To avoid repetition of the information presented in Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, signposting to the relevant sections of these documents has been provided as appropriate. However, the primary purpose of this note is to present a holistic assessment of the lifetime effects within Markham's Triangle pMCZ, drawing together the individual assessments within the Environmental Statement, to provide clarity to Natural England and JNCC.

1.4 The Applicant wishes to highlight that the maximum design scenario presented in the Environmental Statement assumed that up to 24% of the Hornsea Three array area infrastructure would be placed within the pMCZ. As outlined in the Applicant's response to Annex D4 of Natural England's Written Representation (REP1-217), as submitted at Deadline 2 (REP2-004), the Applicant has been working to identify where conservatism in the assessment and design envelope could be reduced and is pleased to confirm that the result of this work is that the maximum design scenario for infrastructure to be installed within Markham's Triangle pMCZ has been substantially reduced from 24% to 10.5%. The Applicant can confirm that this commitment will be secured by an amendment to the draft Development Consent Order (DCO), with the wording of this condition to be presented within the updated draft DCO at Deadline 4.

1.5 Table 1.1 below presents the extents of the broadscale habitat features of Markham's Triangle pMCZ affected by temporary, long term and permanent habitat loss assuming this scenario. This is reproduced from the Applicant's Deadline 2 response (REP2-004) to Annex D6 to Natural England's Written Representation (REP1-125), with the clarifications on the proportions of the Subtidal Coarse Sediment features affected by long term and permanent habitat loss.

1.6 All values quoted for habitat loss within this note are based on the revised maximum design scenario of 10.5%.

Table 1.1: Areas (m^2) and proportions of the broadscale habitat features of Markham's Triangle pMCZ affected across the lifetime of Hornsea Three based on a revised design envelope of 10.5% of array infrastructure being located within the site.

	Area (m2) and % of total habitat	**Area (m^2) and % of Subtidal Coarse Sediment feature affected**	**Area (m^2) and % of Subtidal Sand feature affected**	**Area (m^2) and % of Subtidal Mixed Sediment feature affected**
Temporary habitat loss (construction)	3,914,975 (1.96%)	3,914,975 (2.69%)[1]	416,002 (1.58%)	507,180 (1.84%)
Long term habitat loss (O&M)	300,660 (0.15%)	300,660 (0.21%)[2]	31,948 (0.12%)	38,950[3] (0.14%)
Temporary habitat loss (O&M)	716,518 (0.36%)	716,518 (0.49%)	76,137 (0.29%)	92,824 (0.34%)
Permanent habitat loss (decommissioning)	239,378 (0.12%)	239,378 (0.16%)[4]	25,436 (0.10%)	31,011 (0.11%)

[1] This proportion was incorrectly quoted as 1.96% in the Applicant's response to Deadline 2 (REP2-004).
[2] This proportion was incorrectly quoted as 0.15% in the Applicant's response to Deadline 2 (REP2-004).
[3] This area was incorrectly quoted as 68,950 m^2 in the Applicant's response to Deadline 2 (REP2-004).
[4] This proportion was incorrectly quoted as 0.12% in the Applicant's response to Deadline 2 (REP2-004).

2. Effects Over the Project Lifetime

Pre-construction and construction phase

2.1 Table 2.1 below is reproduced from Table 2.24 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and Table 5.4 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement. It presents the predictions for temporary habitat loss within Markham's Triangle pMCZ during the construction phase but has been updated for the revised maximum design scenario considered in this note, i.e. assuming 10.5% of all array infrastructure could be placed in the part of the Hornsea Three array which overlaps with the Markham's Triangle pMCZ.

Table 2.1: Temporary habitat loss of the broadscale habitat features of the Markham's Triangle pMCZ, assuming 10.5% of all array infrastructure could be placed in the part of the Hornsea Three array which overlaps with the Markham's Triangle pMCZ.

Project element	Temporary habitat loss/disturbance (m^2)	Assumptions
Pre-construction sandwave clearance	2,357,400	Assumes maximum of 10% of the total temporary habitat loss from sandwave clearance within the Hornsea Three array (23,574,000 m^2) will occur within the Markham's Triangle rMCZ. This is unchanged from the Environmental Statement as this was calculated on the basis of the distribution of sandwaves within the array area and the pMCZ.
Pre-construction sandwave clearance disposal activities	14,926	Habitat loss from placement of coarse dredged material to a uniform thickness of 0.5 m as a result of sandwave clearance within the Markham's Triangle rMCZ, assuming a volume of up to 7,463 m^3.
Deposition of material from seabed preparation for GBFs	444,756	Assumes maximum of 10.5% of the total 4,223,330 m^2 of temporary habitat loss associated with the deposition of material from seabed preparation activities.
Jack-up footprints	136,660	Assumes maximum of 10.5% of the total 650,760 m^2 of temporary habitat loss from jack-up placements within the Hornsea Three array area.
Array, interconnector and export (within the Hornsea Three array area) cables (includes boulder clearance)	935,550	Assumes maximum of 10.5% of the total temporary habitat loss associated with the installation of remaining array cables (332 km), interconnector (90 km) and export cables within the array (67.2 km) not requiring sandwave clearance, affecting a corridor up to 15 m for array cables and 25 m for interconnector and export cables.
Anchor placements during cable installation	12,683	Assumes a maximum of 10.5% of total temporary habitat loss from cable installation vessel anchor placements across the Hornsea three array area.

Project element	Temporary habitat loss/disturbance (m^2)	Assumptions
Total temporary habitat loss within Markham's Triangle pMCZ	**3,914,975**	

2.2 As discussed in Table 2.14 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement, approximately one year prior to the start of construction of Hornsea Three, pre-construction activities may be required within Markham's Triangle pMCZ. These may include sandwave clearance activities (including deposition of sandwave clearance material), UXO clearance and boulder clearance. As described in Table 2.24 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and Table 5.4 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, the maximum design scenario assumes that sandwave clearance may affect a 30 m wide corridor for each cable installed within the pMCZ. The maximum design scenario for pre-construction activities predicted temporary habitat loss of up to 2,372,326 m^2 within the pMCZ (see Table 2.1). This is based on the assumption that 10% of the sandwave clearance within the Hornsea Three array area will occur within the pMCZ, which is unchanged from the maximum design scenario assessed within the Environmental Statement as this was calculated on the basis of the distribution of sandwaves within the array area and the pMCZ.

2.3 As discussed in paragraph 2.11.1.93 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.2.5 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, there may be discrete areas within the pMCZ in which sandwave clearance will not be required but boulder clearance may be required. This will not, however, contribute to any additional temporary habitat loss as the process will effectively redistribute boulders and cobbles either side of the 25 m boulder clearance corridor. Following the pre-construction sandwave and boulder clearance activities, additional temporary disturbance of benthic habitats is predicted within a smaller 15 m wide corridor of seabed (within the 30 m corridor affected by sandwave clearance) as a result of the subsequent cable installation during the construction phase.

2.4 Following the pre-construction activities, there will be temporary habitat loss associated with the following construction activities: deposition of material from seabed preparation for gravity base foundations, jack-up footprints, burial of cables and anchor placements. The sum of these construction phase activities was predicted to result in up to 1,542,649 m^2 of temporary habitat loss/disturbance (see Table 2.1) which is a reduction of approximately 56% from the 3,500,263 m^2 presented within the Environmental Statement. The maximum design scenario inclusive of all pre-construction and construction activities, predicted temporary habitat loss of up to 3,914,975 m^2 (1.96% of the total area of the pMCZ; see Table 2.1) which is a reduction of approximately 56% from the 5,872,589 m^2 presented within the Environmental Statement. The reduced maximum design scenario equates to up to 2.69% of the Subtidal Coarse Sediment feature, 1.58% of the Subtidal Sand feature and 1.84% of the Subtidal Mixed Sediment feature within the pMCZ being affected by temporary habitat loss/disturbance.

2.5 The recovery of the benthic communities present within the pMCZ from the temporary habitat loss is described in paragraph 2.11.1.96 *et seq*. of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.2.9 *et seq*. of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement. The recovery of the benthic communities associated with the Subtidal Sand feature is likely to be high, as discussed in paragraph 2.11.1.26 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.2.14 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, with recovery anticipated within up to two years. For the coarse and mixed sediment communities present within pMCZ, the timeframes for recovery are predicted to be in the region of up to five years (see paragraph 2.11.1.31 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement).

2.6 Therefore, the benthic habitats are not predicted to have substantially recovered in the period between the pre-construction activities (i.e. sandwave/boulder clearance) and construction activities, hence the temporary disturbance during construction is considered to be an extension of the original sandwave/boulder clearance disturbance rather than repeat disturbance (see paragraph 2.11.1.18 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement).

2.7 As noted in Table 2.14 and paragraph 2.11.1.18 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.2.19 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, Hornsea Three may be constructed over up to two phases, however following completion of cable installation there will be no potential for repeat direct physical disturbance to the footprint of seabed previously impacted by cable burial during the construction phase as this would pose a risk to the integrity of the cable.

2.8 With the exception of impacts associated with the presence of the foundations and scour protection on the seabed which will extend through into the operation and maintenance phase (see paragraphs 2.9 *et seq*. below) and the localised placement of cable protection, the majority of impacts within Markham's Triangle pMCZ will be associated with one-off construction impacts. As all cables within the pMCZ are anticipated to be successfully buried and remain buried for the anticipated 35 year design life of Hornsea Three, impacts to benthic habitats and broadscale habitat features of the pMCZ, with the exception of impacts in the immediate vicinity of the turbines, will therefore largely cease following construction with recovery over the time periods outlined above. However, as discussed in paragraph 2.11.1.18 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.2.19 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, following cable installation there may be a requirement for some very localised remedial cable reburial works, during the construction phase, which would be undertaken within approximately one year of the initial cable laying works. For the same reasons as outlined above, it is not considered to constitute repeat disturbance but rather an extension of the original disturbance activity within the original footprint with recovery following the timescales described above once the remedial burial works are complete. The recovery of the benthic communities in these areas is predicted to follow the same timescales as described above and in paragraph 2.11.1.30 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement.

Operation and maintenance phase

Array and export cables

2.9 As discussed above, the majority of the impacts within Markham's Triangle pMCZ will cease at the end of the construction phase as the preference is to bury cables and activities such as seabed preparation will be a one-off event. However, as discussed in paragraph 2.11.2.169 *et seq*. and Table 2.14 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement, the 10.5% maximum design scenario assumes that some limited and highly localised cable reburial works may be required within the pMCZ over the 35 year design life of the Hornsea Three project. Applying the revised 10.5% maximum design scenario explained in paragraph 1.4 above, this could result in up to 131,324 m^2 of temporary habitat disturbance which equates to 0.36% of the total benthic habitat within the site (reduced from 1,625,776 m^2 set out in paragraph 2.11.2.169 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.3.14 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement). These reburial works would affect areas previously affected by cable installation during construction and therefore would represent repeat disturbance, although the proportion of cables affected by this activity would be minimal relative to the total length of cables installed. The recovery of the benthic communities in these areas would be predicted to follow the same timescales as described above.

2.10 There may also be some localised areas within the pMCZ where burial fails (following construction phase burial and any further attempts at remedial burial) and the installation of cable protection is required. An assessment of the long-term habitat loss associated with cable protection and cable/pipeline crossings within the pMCZ is made in paragraph 2.11.2.38 *et seq*. of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.3.1 *et seq*. of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement. The Applicant would highlight the commitment to employing sensitive cable protection measures, as outlined in Table 2.14 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement. These would facilitate some continued ecological functioning in areas where these are deployed, thus limiting the effects of long-term habitat loss in contrast to other cable protection measures (e.g. concrete mattressing, larger grain sizes etc.). The Applicant directs the Ex.A to the Cable Protection Clarification Note submitted to Natural England and presented at Appendix 6 to the Applicant's response to Deadline 1 (REP1-138) and also to the Applicant's submissions on this topic at the hearing as set out in the written summary submitted at Deadline 3, where supporting evidence for the use of sensitive cable protection is provided.

2.11 The revised 10.5% maximum design scenario (see paragraph 1.4) predicts that long-term/permanent habitat loss from cable protection (maximum design scenario that up to 10% of cables would require cable protection) and cable/pipeline crossings within the pMCZ would affect no more than 99,079 m^2 of broadscale habitats within the pMCZ, assuming that up to a maximum of 10% of cables would require cable protection (reduced from 224,808 m^2 set out in Table 2.28 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement). The maximum design scenario for long-term habitat loss would affect a very small proportion of the broadscale habitat features proposed for designation within the pMCZ as follows: up to a maximum of 0.07% of the Subtidal Coarse Sediment feature, up to a maximum of 0.04% of the Subtidal Sand feature and up to a maximum of 0.05% of the Subtidal Mixed Sediment feature, depending on where cable

protection may be deployed. It should be noted however, that these are the maximum design scenarios for each of the broadscale habitat features and are not additive (e.g. in the event that all cable protection is installed within Subtidal sand for example, there would be no long-term habitat loss to any other broadscale habitat features).

Turbine and foundations

2.12 In the immediate vicinity of the turbine foundations, any habitat disturbed during seabed preparation works prior to gravity base foundation installation (the maximum design scenario) during the construction phase will be subsequently impacted by long-term habitat loss associated with the foundation footprint and associated scour protection. As discussed in paragraph 2.11.1.9 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement, the area of long-term habitat loss associated with the footprint of the turbine foundations and associated scour protection is greater than, and therefore completely encompasses the area impacted by the seabed preparation activity itself. Therefore, this impact was assessed as long-term habitat loss only and only the deposition of seabed preparation material was included in the assessment of temporary habitat loss/disturbance.

2.13 The revised 10.5% maximum design scenario predicts that up to 201,582 m^2 of long-term habitat loss may result from the presence of foundations and scour protection, reduced from 457,388 m^2 as set out in the Environmental Statement. As discussed above in paragraph 2.10, the Applicant would additionally highlight the commitment to employing sensitive scour protection measures within the pMCZ, as outlined in Table 2.14 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement. As for the cable protection, this would facilitate some continued ecological functioning in areas where scour protection measures are deployed, thus further limiting the effects of long-term habitat loss in contrast to other scour protection measures. The revised maximum design scenario for long-term habitat loss from foundations and scour protection would affect a very small proportion of the broadscale habitat features proposed for designation within the pMCZ as follows: up to a maximum of 0.14% of the Subtidal Coarse Sediment feature, up to a maximum of 0.08% of the Subtidal Sand feature and up to a maximum of 0.09% of the Subtidal Mixed Sediment feature.

2.14 As discussed in paragraph 2.11.2.147 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and 5.2.3.14 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, there will be a limited amount of temporary habitat disturbance during the operation and maintenance phase resulting from jack-up operations associated with turbine and offshore substation component replacement and access ladder/j-tube repair/replacement. Although there is the potential for repeat disturbance to the habitats in the immediate vicinity of the foundations because of these activities, impacts will be restricted to the immediate area around the turbine foundation and the spatial extent of this impact is predicted to be small (up to 585,194 m^2) and would represent highly localised, repeat disturbance occurring intermittently across the 35 year operation and maintenance phase of the project.

2.15 As discussed in paragraph 2.11.2.69 *et seq*. of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.3.22 *et seq*. of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, there is the potential for impacts to arise during the operation and maintenance phase as a result of the colonisation of foundations and scour/cable protection and the potential introduction of hard substrate species into a predominately soft sediment environment. As assessed in paragraph 2.11.2.72 *et seq*. of Volume 2,

Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.3.30 *et seq*. of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement the presence of the offshore infrastructure during the operation and maintenance phase also has the potential to facilitate the introduction and spread of invasive non-native species (INNS). It is expected that the introduction of hard substrates will offer opportunities for epifaunal communities already present within Markham's Triangle pMCZ (e.g. scour tolerant species colonising coarse gravelly sediments, cobbles and boulders) to expand their range onto the introduced hard substrates. Some reef effects may result in expansion of taxa normally associated with hard substrates colonising areas of Subtidal Coarse Sediment, Subtidal Mixed Sediment or Subtidal Sand features, although these effects are likely to be limited to the immediate vicinity of offshore structures (i.e. the same areas affected by long term habitat loss) and are not predicted to result in changes to the species composition of communities associated with the proposed broadscale habitat features across the wider Markham's Triangle pMCZ (see paragraph 5.2.3.28 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement).

2.16 With respect to impacts from INNS, as discussed in paragraph 5.2.3.35 of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement, the commitment to the use of sensitive cable and scour protection measures which reflect the background substrates within the pMCZ will help to reduce the risk of colonisation by INNS, by providing a substrate that is similar to those occurring within pMCZ and encouraging colonisation by scour tolerant epifaunal species native to the pMCZ. Furthermore, the implementation of a Biosecurity Plan (see Table 2.18 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement; secured by Schedule 11, Condition 13(1)(d)(iii) (generation assets DML) and Schedule 12, Condition 14(1)(d)(iii) (transmission assets DML) of the draft DCO submitted for Deadline 1; REP1-133) will help to minimise the risk from INNS as much as is practical.

2.17 On-going impacts to broadscale habitat features of the pMCZ across the operational lifetime of Hornsea Three are therefore predicted to be largely restricted to the immediate vicinity of the turbine and substation foundations (i.e. those areas assessed as being affected by long term habitat loss) with the mitigation measures to be implemented (i.e. sensitive cable/scour protection and a Biosecurity Plan) designed to minimise the impacts as far as possible.

Decommissioning and Post-decommissioning

2.18 As discussed in paragraph 2.11.3.25 of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement, temporary habitat loss associated with the maximum design scenario for cable removal during decommissioning is likely to be of a similar magnitude as during construction. Recovery of the benthic communities will follow these activities as described in paragraph 2.5 above.

2.19 The only impact which has the potential to continue beyond the decommissioning phase of the project is permanent habitat loss associated with cable protection and scour protection remaining in situ within the Markham's Triangle pMCZ (i.e. only foundations and turbines being removed). This is assessed in paragraph 2.11.3.56 *et seq*. of Volume 2, Chapter 2: Benthic Ecology of the Environmental Statement and paragraph 5.2.4.4 *et seq*. of Volume 5, Annex 2.3: Marine Conservation Zone Assessment of the Environmental Statement.

2.20 The revised maximum design scenario predicts that permanent habitat loss would equate to 239,378 m^2 (0.12% of the total habitat within the pMCZ). Permanent habitat loss persisting beyond decommissioning would affect very small proportions of the broadscale habitat features proposed for designation within the pMCZ as follows: 0.16% of the Subtidal Coarse Sediment feature, 0.1% of the Subtidal Sand feature and 0.11% of the Subtidal Mixed Sediment feature. The Applicant will however be required to develop a Decommissioning Plan to cover the decommissioning phase, which will take account of the latest guidance and advice from stakeholders at the time.

Conclusion

2.21 As summarised above, all impacts associated with the installation of cables within Markham's Triangle pMCZ during the construction phase of Hornsea Three will be temporary and reversible. For the vast majority of the seabed affected within Markham's Triangle pMCZ, once the pre-construction activities are complete and the array, interconnector and export cables are installed within the site, there will be no repeat disturbance over the 35 year design life of Hornsea Three and the benthic communities will recover. For a small proportion of the area affected by initial cable installation, there may be some repeat disturbance associated with cable reburial/repair works during the operation and maintenance phase, although the effects on broadscale habitat features will also be temporary and reversible. For a different, but similarly small, proportion of the pMCZ there may be localised long-term habitat loss as a result of cable protection measures, where cable burial and reburial is not successful. This has the potential to persist post-decommissioning. The sensitive cable protection mitigation measures to be implemented have, however, been designed to minimise the change in substrate and therefore potentially reduce the magnitude of any negative impacts from long-term/permanent habitat loss as far as possible. Given that the benthic communities are predicted to recover between the temporary disturbance events and that the long-term/permanent habitat loss will be small and localised, the combination of all of these impacts over the lifetime of Hornsea Three is not predicted to result in effects which will be any more significant than the individual impacts in isolation. As such, all impacts associated with the installation, operation/maintenance and decommissioning of cables and cable protection over the lifetime of the project are therefore not predicted to lead to a significant risk of hindering the achievement of the draft conservation objectives for the features of the Markham's Triangle pMCZ.

2.22 As discussed in this note, with respect to the foundations (i.e. for turbines and substations), the areas where impacts occur during the construction phase (e.g. from seabed preparation, jack-up footprints) will be the same as those assumed to be affected for the maximum design scenario for long-term habitat loss during the operation and maintenance phase as a result of the physical presence of the foundations and associated scour protection on the seabed. The sensitive cable protection mitigation measures to be implemented have, however, been designed to minimise the magnitude of any negative impacts from long-term/permanent habitat loss as far as possible. Further on-going effects during the operation and maintenance phase, such as may arise from potential changes to community structure including the risk from INNS and from jack-up operations during maintenance activities, will be largely restricted to the immediate vicinity of the turbine and substation foundations affecting only a very small proportion of total area of Markham's Triangle pMCZ. These will largely, or likely exclusively, be coincident with those areas affected by the maximum design scenario for long term habitat loss (i.e. from foundations and associated scour protection). Furthermore, the mitigation measures to be implemented (i.e. implementation of a Biosecurity Plan) have been

designed to minimise the magnitude of any negative impacts as far as possible. On the basis that the impacts associated with turbines and foundations during each phase of the project will be highly localised to the immediate vicinity of the turbines and with the sensitive scour protection measures implemented, the combination of all of these impacts over the lifetime of Hornsea Three is not predicted to result in effects which will be any more significant than the individual impacts in isolation. As such, all impacts associated with the installation, operation/maintenance and decommissioning of turbines and foundations over the lifetime of the project are not predicted to lead to a significant risk of hindering the achievement of the draft conservation objectives for the features of the Markham's Triangle pMCZ.

2.23 Similarly, the combination of impacts associated with turbines/foundations and cables within Markham's Triangle 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 or lead a significant risk of hindering the achievement of the draft conservation objectives for the features of the Markham's Triangle pMCZ.

2.24 The Applicant notes that the Marine Management Organisation guidance (MMO, 2013)[5] defines the term 'hinder' as any act that could, either alone or in combination "*in the case of a conservation objective of "recover", decrease the likelihood that the current status of a feature could move upwards (e.g. from degraded to favourable) either immediately or in the future (i.e. they would be placed on a flat or downward trend)*."

[5] Marine Management Organisation (2013). Marine conservation zones and marine licensing. April 2013. Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/410273/Marine_conservation_zones_and_marine_licensing.pdf