

Norfolk Vanguard Offshore Wind Farm

Consultation Report

Appendix 22.1 Section 42 Responses

Applicant: Norfolk Vanguard Limited
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Photo: Kentish Flats Offshore Wind Farm



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Section 42 – Table of feedback from consultees, and regard had by the Applicant

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Feedback related to Project Description (Chapter 5 of ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 5 Project Description	Cadent Gas Ltd	December 2017	Provide key considerations that are required in relation to pipeline crossings.	These will be taken into account when seeking crossing and/or proximity agreements with Cadent Gas Ltd.
Chapter 5 Project Description	Happisburgh Parish Council	December 2017	The Parish Council would strongly recommend that any landfall for both wind farms is made at the same time	Norfolk Vanguard Ltd is not able to commit to undertaking concurrent landfall works for Norfolk Boreas .
Chapter 5 Project Description	Natural England	December 2017	In relation to drill arisings it is stated that up to 50% of locations for pin piles will need drilling where they may be driven, drilled or drilled-driven. Previously it has been stated that alternative methods, i.e. drilling or vibration may be required depending on the ground conditions (para 58 page 27). Is this EIA also considering drill arisings from vibration and drilling techniques or just drilling.	An estimate of 50% of the locations requiring drilling is included in the EIA to allow a conservative assessment of drill arisings. The installation methodology used (to be determined during post consent final design) would fall within the worst case scenarios presented (e.g. maximum drill arisings and underwater noise levels).
Chapter 5 Project Description	Natural England	December 2017	The worst case assumption is that excavation of up to 5m depth could be required if a sand wave is encountered during piling. What evidence is this based upon and why up to 5m?	The Fugro (2016) geophysical survey showed that sandwaves are approximately 5m in height.
Chapter 5 Project Description	Natural England	December 2017	With regards to potentially using frond mattresses, has their effectiveness been determined elsewhere? From Natural England's perspective it may be more desirable to install a more "natural" structure, particularly if they will be left in-situ at the time of decommissioning.	A range of cable protection options are presented in order to allow the most appropriate type to be selected during final design.
Chapter 5 Project Description	Natural England	December 2017	It is unclear how the pre-sweeping volumes have been calculated – was there an average sandwave height that was taken?	Pre-sweeping volumes have been analysed by CWind (2017).
Chapter 5 Project Description	Natural England	December 2017	More information regarding the location and age of this "out of service" cable is needed. It may be better to leave it in situ if it is likely to break and multiple operations are needed for recovery.	Options to either leave or remove some existing cables has been considered in the total cable protection (Section 5.4.14).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 5 Project Description	Natural England	December 2017	The temporary disturbance width does not consider potential disturbance from anchored vessels along the cable route (when jointing cables, for example).	Vessel anchors have been added to the maximum total footprints outlined in section 5.4.1.1
Chapter 5 Project Description	Natural England	December 2017	Any protection over cable crossings needs to be carefully installed to ensure that it does not exacerbate or encourage scouring to occur, particularly within the SAC. Further consultation with Natural England will be needed.	A range of cable protection options are presented in order to allow the most appropriate type to be selected during final design. The details will be consulted on through the Project Environmental Management Plan (PEMP).
Chapter 5 Project Description	Natural England	December 2017	The construction window of 3 to 7 years has been stated. Seven years represents a large period of disturbance, and would be unfavourable in terms of impacts upon environmental elements.	Norfolk Vanguard Ltd has committed to reducing the offshore construction window to 4 years
Chapter 5 Project Description	Natural England	December 2017	A full outline Operation and Maintenance Plan is to be submitted with DCO. In paragraph 250 the need for regular/periodic surveys is discussed. As recently advised for other OWFs in relation to operation and maintenance works we advise that a regulatory review (such as the 5 yearly reviews within the Aggregates industry) should be implemented in order to ensure that the monitoring evidence will be used to inform further works	An Outline Operations and Maintenance Plan (document 8.11) and In Principle Monitoring Plan (document 8.12) are submitted with the DCO application.
Chapter 5 Project Description	Natural England	December 2017	Given the calculation is the following sentence supposed to say per year ? It has been assumed that a maximum of two locations could be visited by one jack up vessel to the OWF sites per day during operation.	A conservative estimate of visiting 2 turbines per day during operation and maintenance (O&M) has been included in the EIA

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Chapter 5 Project Description	NSAG	December 2017	It was only when the PEIR document was released that we discovered that the National Grid extensions at Necton would enlarge their part of the site from 2 hectares to 9.1 hectares, that they would be adding a pylon, and that other overhead work would need to take place as well.	Section 1.4.4.3 of the Scoping Report stated that additional switchgear and electrical equipment would be required at the Necton National Grid Substation to connect Norfolk Vanguard. At that time, it was envisaged that any works required at the National Grid Substation would be consented by National Grid. Norfolk Vanguard Ltd subsequently decided to take responsibility for consenting the National Grid works in order to provide a holistic assessment and management approach for the project.
Chapter 5 Project Description	National Farmers Union	December 2017	The NFU requested additional information on the project design of relevance to agriculture.	Responses are detailed in Table 21.3 of Chapter 21 Land Use and Agriculture.

Feedback related to Marine Geology, Oceanography and Physical Processes (Chapter 8 of ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	The draft PEIR repeats throughout that marine physical process impacts have been generated by 'expert-based assessment and judgement' (8.1, p1). As there is no identification of the experts nor their specific expertise it is assumed that this refers to 'the authors'.	Expert-based assessment and judgement has been undertaken by Royal HaskoningDHV. This is clarified in sections 8.1 and 8.4.

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Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	Paragraph 139 states that the modelling simulations undertaken for the East Anglia ONE confirm the expert-based assessment of suspended sediment concentrations arising from seabed preparation. However it is not clear that the expert-based assessment is entirely independent of this evidence i.e., it can't confirm the opinion if the opinion has been based on it in the first place.	The emphasis has been changed to demonstrate that the East Anglia ONE modelling was used as part of the expert-based assessment and judgement (various sections).
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	The draft section 8.7.4 stated that minimum turbine separation is 616m to minimise interaction and wake effects. Table 8.12 defines near-field effects (of suspended sediment concentrations) as affecting up to 1km from each foundation i.e., potential effects effectively extend over the whole area. There is no significant other mention of wake effects/plume in this report but the descriptions of impact indicate that there is potential for wake effects and plumes of sediment suspension to be generated. This should be discussed as a separate potential source of environmental effect.	Norfolk Vanguard Limited has revised the minimum spacing to 680m. This statement still stands in that 680m is the minimum separation between turbines in order to minimise any effects, not completely eradicate them. The wake effect that is referred to is for the changes to tidal currents and waves during the operation and maintenance phase of the wind farm. The wake effect is discussed in the individual operational impact sections for tidal currents and waves and a zone of influence is defined for each of these (i.e. extending over the whole OWF sites as commented on). Plumes created by scour during the operation and maintenance phase are not discussed because scour protection will be used, reducing sediment release to negligible quantities. Table 8.15 refers to the plume that would be generated for drill arisings during construction and so there would not be the 'cumulative' effect (i.e. over the whole area) that might occur for all the turbines in place during operation and maintenance.

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Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	<p>The draft Impact 2A noted that mounds of sediment up to several metres high may be formed, and considers these small compared to the absolute depth of water >20m. However, water depth is less than that in some parts of the area and ‘several metres’ may amount to 30% or more. The applicant would not be justified in saying that the change in elevation is within the natural change caused by sand waves and ridges and that hence blockage is negligible, because the mounds would be separate to the natural features and represent an additional blockage.</p> <p>However, Cefas concur with the final statement in this paragraph – “The mound will be mobile and be driven by the physical processes, rather than the physical processes being driven by it”. This is a key point in the assessment – that the majority of effects on physical processes are temporary redistribution of sediment, largely confined within the area of the OWF which is therefore the maximum extent of initial seabed disturbance, and that processes will re-equilibrate with the bed relatively quickly.</p>	<p>The bathymetry indicates that in NV West and NV East, the water depths are never less than 20m. Hence, the statement in the ES remains valid. The plume assessment is construction only and is not related to wakes around turbines but to simple release of sediment into the water column through drill arisings or seabed preparation and its re-distribution by tidal currents (without creation of wakes).</p> <p>Due to Norfolk Vanguard Limited’s commitment to use scour protection where required, this will minimise any potential plumes due to wakes around turbines during operation and maintenance and so this has not been assessed further (also see response above). The potential for secondary scour around scour protection was also discussed during the EPP but was agreed in July 2017 that this is not a potential issue.</p>
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	Draft Impact 5 - The applicant indicates that some of the removed bed sand could be disposed on the (residual) upstream side of the cable such that natural processes could redistribute the sand back over the levelled areas to reform the natural bed sand waves. This is an approach which should, be encouraged and, over the works as a whole, a similar approach would minimise disturbance of the natural processes i.e. timing works to encourage the redistribution of disturbed	The potential re-distribution of sediment after disposal within Norfolk Vanguard is discussed in section 8.7.7.9.1.

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			sediment in an initial (residual) upstream direction would see the natural process restore the residual downstream bed over time.	
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	Draft section 8.7.5.10 notes that suspended sediments may exceed prevailing levels but remain within background levels range – this should be supported by justified quantitative estimates.	Reliable quantitative assessments of suspended sediment concentrations close to the coast are difficult to obtain and so a qualitative conceptual approach has been adopted in section 8.7.7.5.
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	The statement in paragraph 189 of the draft PEIR “As there is a large separation distance (well beyond one tidal ellipse) there is no evidence to support the existence of a pathway between the source and the receptor groups for marine physical processes” appears to be out of place in this location - as a general assessment of physical process impacts, this should be introduced where supported by the physical evidence it is based on (i.e., the wave, tidal and transport information given in sections 8.5 and 8.6, and so in conjunction with the suggested illustration of the sediment transport system). Paragraph 189 of the draft PEIR is not justifiable in its present form - the size of the tidal ellipse does not limit the range over which changes to the	Removed. In this impact section and the previous seabed preparation impact section it is shown that there is the potential for the plume to extend approximately 50km from the release point (based on East Anglia ONE modelling). It is also stated that at these large distances the thickness of deposition from the plume would be very small (less than 0.15mm thick). So, although removal of the tidal ellipse statement is justified, the overall conclusion of negligible impact in the far-field is also justified.

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			transport regime may propagate over multiple tidal cycles and so should probably be removed from this sentence (the same could also apply to paragraph 241).	
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	Paragraph 251 of the draft PEIR could be supported quantitatively and potentially also relocated to form part of a defined section outlining the support and justification for considering EA OWF as primary evidence for NV assessment.	A section was added to the PEIR (section 8.7.3 in this ES) that discusses in detail the justification for using the modelling results of East Anglia ONE as analogies for the potential effects/impacts of Norfolk Vanguard.
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	A regional sediment transport map should be provided (to accompany sections 8.6.8 and 8.6.9). Not only would this be useful in respect of statements made later in the report (e.g., that there is no pathway for changes offshore to affect the shoreline), but it would be a major piece of evidence in support of the assumption that the physical contexts of the East Anglia OWF are sufficiently similar to Norfolk Vanguard to justify their use as primary evidence for impact assessment of the latter. It would also clarify the step to section 8.6.11 (coastal process at the	Figure and explanation added to section 8.6.8.

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			landfall / shoreline), and thence to the impact receptors defined in 8.7.	
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	Section 8.7.1 of the draft PEIR indicates ‘receptor groupings’ relevant to Norfolk Vanguard, and references Figure 8.11, but the text and figure refer to different named areas, with no indication of how the two are related. This information is provided afterwards – paragraph 104 and Table 8.9 should precede the Figure.	Section 8.7.1 re-arranged to clarify.
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	The cable corridor bridges the offshore-inshore transition and will require consideration of nearshore processes in addition to offshore processes at the turbine site, with the possibility of affecting the defined receptors by a different pathway – this too will benefit from mapping what is understood of the regional transport systems.	Offshore cable construction activities including the inshore transition are covered in sections 8.7.7.5 to 8.7.7.8. The supporting information on regional transport pathways is included in section 8.6.8.
Chapter 8 Marine Geology, Oceanography and Physical Processes	Cefas	Written feedback dated 1 st July 2017 (provided 6 th July 2017) in response to an early draft of the PEIR chapter dated 21 st June 2017	Cefas is unsure of the intention behind the statement made in paragraph 228 – that “the value of the East Anglia coast is deemed medium; it ... is of regional importance for coastal processes”.	This was removed from the PEIR and does not appear in this ES.

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Chapter 8 Marine Geology, Oceanography and Physical Processes	Happisburgh Parish Council	12th September 2017	There is a worrying lack of understanding of coastal process given the short tidal window to manage and complete work on one the most dynamic full tidal beaches in the UK. No methodology has been given to the management of the beach or public safety. The Parish Council is concerned that Vattenfall does not seem to understand that one metre of beach can be lost during a storm - that is the depth at which the cable would be buried with a short drill!	A decision has been made, based on consultation feedback, to use long HDD at the landfall with an exit point in the subtidal zone beyond -5.5m LAT (approximately 1km from the onshore drilling location). Therefore these concerns have been addressed, as potential intertidal impacts would be avoided.
Chapter 8 Marine Geology, Oceanography and Physical Processes	North Norfolk District Council	8th December 2017	In respect of the Construction Phase, the Council's Coastal Manager considers that the horizontal directional drilling (HDD) long exit option is preferred as it would prevent any clear interference with coastal processes.	A decision has been made, based on consultation feedback, to use the long HDD option at the landfall so impacts on coastal processes are minimised.
Chapter 8 Marine Geology, Oceanography and Physical Processes	North Norfolk District Council	8th December 2017	In respect of the Operation Phase, the Council's Coastal Manager considers that as there is a preference for buried cabling in the seabed in the nearshore, there are limited concerns with regards to wider impacts to coastal erosion/processes during operation. The PEIR suggests that buried cabling is preferred in all but incompatible circumstances, if it was not possible to bury cabling in the nearshore environment, further consideration would be required. One area where issues could arise is ensuring the depth of cable under the foreshore is sufficient to prevent uncovering as the cliff, beach and shore platform erodes (and lowers) over time. This may be more likely under the short HDD exit option. A post construction monitoring plan should identify such risks and ensure appropriate coastal monitoring of coastal processes to ensure early	This impact is covered in section 8.7.8.6. An Outline Scour Protection and Cable Management Plan (document 8.16) as well as an Offshore In Principle Monitoring Plan (document 8.12) are provided with the DCO application to outline the approach to monitoring and management of cables. Details of required monitoring will be agreed with Marine Management Organisation (MMO) in advance of construction.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			identification of issues and timely remediation should they occur.	
Chapter 8 Marine Geology, Oceanography and Physical Processes	North Norfolk District Council	8th December 2017	In terms of cable decommissioning, the PEIR identifies that the cabling can simply be pulled from the ducting for disposal, however, there should be recognition that as the coast erodes, there is a risk that the seaward, and, over the long term, landward duct and infrastructure will be exposed and will require removal. Currently there are no funded mechanisms for the removal of historical/redundant infrastructure as it is exposed via erosion and as such these burdens often fall to the Local Authority. Long term arrangements would be beneficial to ensure that such implications do not, through default, fall to future generations of local government.	A Decommissioning Plan (Requirement 14 of the DCO Schedule 1 Part 3) will be produced for the project prior to construction.
Chapter 8 Marine Geology, Oceanography and Physical Processes	North Norfolk District Council	8th December 2017	The horizontal directional drilling (HDD) long exit option is preferred when bringing the offshore cable onto land.	A decision has been made, based on consultation feedback, to use the long HDD option at the landfall.
Chapter 8 Marine Geology, Oceanography and Physical Processes	Environment Agency	11th December 2017	Our preferred option would be to use long HDD to minimise impact on the shore face and emerged beach.	A decision has been made, based on consultation feedback, to use the long HDD option at the landfall.

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Chapter 8 Marine Geology, Oceanography and Physical Processes	Environment Agency	11th December 2017	An idea of error introduced from geo-referencing and digitisation from the desktop survey of historic erosion rates would be useful (see Appendix 4.1 in the draft PEIR).	This was discussed with the Environment Agency during an Expert Topic Group meeting on the 31 st Jan 2018. It was accepted that the majority of the coastal erosion study is based on interpretation of rates published in the SMP and coastal study. Digitisation is a limited part of the assessment, and its uncertainty is captured in the broader uncertainty that has been reported.
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	No specific surveys have been carried out for this report, essentially only a transfer of previous analyses of modelling results for other similar works to this context (principally the East Anglia ONE OWF). The original analyses have not been reviewed here and will have been subject to assessment as part of the relevant application.	New surveys, specific to the project, have been carried out for bathymetry, geology and metocean (see Table 8.8).
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	This study does show considerable overlap between the envelope of effects on hydrodynamics (in terms of wave height) for an adjacent development (East Anglia Three) and Norfolk Vanguard East. The assessment essentially concludes that effects of each individual development are negligible, and that the cumulative impacts are negligible also. However, the method used (simple extension of modelling results for a third individual development) does not convincingly support this conclusion since the original results did not assess in-combination effects.	The approach to cumulative operational effects on waves was based on expert assessment (overlapping of zones of potential influence) as described in section 8.8.3. The modelling results of East Anglia ONE were used in the expert assessment merely to show that changes to waves due to the presence of foundation structures would be small in magnitude and localised in spatial extent (i.e. restricted to the vicinity of each foundation), and that this applies to cumulative layouts as well as for individual wind farm layouts.
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	The assessment has not considered the actual function of wave action within the regional sediment transport system. Physical process impacts are presented as the percentage changes to currents and wave height but these are not quantified in terms of the receptors i.e., the	The reasoning behind there being no impact on sediment transport is related to scaling. The larger scale processes of the southern North Sea (altered albeit locally by the changes to waves and tidal currents) would continue undisturbed and effectively

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			percentage change in sediment transport this would cause.	immeasurable. This is described in more detail in section 8.7.8.3.
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	<p>Table 8.1 in the PEIR indicates that the applicant was advised that coastal geomorphology and sediment transport modelling should be performed, and that (it was agreed that) the PEIR would do so on the basis of a conceptual model and expert judgment. This approach is weakest in the nearshore zone as no specific information has been presented only assumptions, such as higher suspended sediment concentration.</p> <p>The PEIR mentions an installation study (Cwind, 2017), which is unpublished and not provided, that may contain some relevant details, but there is no specific presentation of this information. Please provide that information in the Environmental Statement.</p>	<p>Data on suspended sediment in the nearshore zone has been requested from the Environment Agency or MMO through the EPP. It was discussed and agreed during the Expert Topic Group meeting on the 31st Jan 2018 that no data are available and that the approach taken to the assessment is appropriate.</p> <p>The CWind study (2017 unpublished) was provided to the Expert Topic Group in January 2017. This contains no information on the nearshore zone.</p>
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	<p>Proactive mitigation of engineering risk has been indicated, in the form of widespread scour protection around assets. This is not mitigating for impact on Marine Processes as such, as this is simply replacing one impact for another. I.e. a scour hole being replaced by a complete change of substrate. The total area of seabed disruptions is not really amenable to mitigation. The impact on the designated areas in particular is a fixed quantity caused by the construction process. Thus, no mitigation is possible for the disruption of seabed sediment (the reason for designation of Haisborough, Hammond and Winterton SAC). Also</p>	<p>This ES chapter has removed reference to scour protection as mitigation; rather it is the reason why the impact of scour has not been assessed. The impact of habitat loss associated with scour protection is assessed in full in section 8.7.8 of this ES chapter.</p> <p>The direct loss of habitat caused by scour protection around the foundation structures will have no impact on Haisborough, Hammond and Winterton SAC because they are outside the SAC boundary. Embedded mitigation associated with minimising disruption to sediment in the SAC are outlined in section 8.1.1. The effect on sediment transport processes in the SAC of</p>

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			the choice of scour protection (concrete mattresses or plastic fronts, for example) is not significant in these terms. Please reflect this in the Environmental Statement.	sand wave levelling along the export cable corridor is addressed in section 8.7.7.6.
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	Monitoring is necessary to verify the assumptions of localised impact. i.e. bathymetry to demonstrate recovery of the sand waves and that the sea bed level changes associated with trenches, mounds and depression created do not spread but are gradually erased.	An Offshore In Principle Monitoring Plan (document 8.12) is provided with the DCO application to outline the approach to monitoring. Details of required monitoring will be developed in consultation with the MMO in advance of construction.
Chapter 8 Marine Geology, Oceanography and Physical Processes	MMO	11th December 2017	Monitoring of the nearshore geomorphology, where temporarily affected by works, should be carried out around the period of development. This is to demonstrate that no major changes have occurred due to the development since this area has been assessed in very vague terms only.	An Offshore In Principle Monitoring Plan (document 8.12) is provided with the DCO application to outline the approach to monitoring. Details of required monitoring will be developed in consultation with the MMO in advance of construction.

Feedback related to Benthic and Intertidal Ecology (Chapter 10 of ES)

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Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It is unclear how the separate data sets (i.e. zonal, EA4 and Norfolk Vanguard) have been used. It is difficult to understand what has been done and	Further clarity has been provided, on what samples were included in the statistical analysis in Appendix 10.2.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			when. We advise that it would be clearer to state what has been agreed and where gaps have subsequently been filled in.	
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Figures must be provided to show the location of the designated features of the Haisborough, Hammond and Winterton SAC, plus the site boundary against the anticipated impact.	The Information to Support HRA Report provides an assessment of the impact on designated features within the Haisborough Hammond and Winterton SAC. Figures 7.1 and 7.2 of the Information to Support HRA report show Annex 1 Sandbanks and Annex 1 reef, respectively.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	The consultee cautions the use of EIA matrices when assessing impacts for Annex I habitats as it is not directly relatable to conservation objectives. A clearer conclusion is required at the end of each consideration, culminating in a conclusion of the remaining key issues where a LSE remains and will be carried through to a HRA.	The Information to Support HRA Report (document 5.3) assesses the impacts of the project against the achievement of the conservation objectives for the site. –
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Natural England advises that an indicative scour protection and cable protection plan/s is provided as part of the application. Further information on the locations of the cable crossings or areas where protection will be needed would be helpful in order to provide more specific advice on the significance of impacts.	A Scour Protection and Cable Protection Plan will be submitted as part of this DCO application (document 8.16).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It was stated that cable protection will likely to left in situ following decommissioning. This would therefore have a permanent effect in the form of habitat loss and change in habitat, therefore affecting the form and function of the SAC. This should be acknowledged.	This is recognised within the chapter in sections 10.7.5.1 and 10.7.5.2 and within the Information to Support HRA Report, where the impacts of “permanent Habitat loss” on the conservation objectives is assessed.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Clarification is required regarding the quantity/frequency of the reburial of the 10km of cable within the SAC and whether the two	Clarity on the predicated quantity/frequency of the cable reburial within the SAC is provided in Section 7.3.2.3.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			occurrences of cable repair are the WCS. Consideration is needed for the repeated nature of the impacts impeding recovery of the site.	
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Full details should be provided on the disposal of dredged material. In particular, further justification and information is required regarding the proposed sand wave clearance and the potential impacts within the SAC. There is currently insufficient information on the impacts on and recovery of sand waves to support implementation within designated sites. A requirement for a sand wave levelling plan should be included in the Deemed Marine License.	In support of the Information to Support HRA Report (document 5.3) further work has been undertaken assess the impacts and recovery of sand waves within the SAC (Appendix 8.1).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We advise that Conservation Objectives should be considered when determining the level of impact of designated features and advise that evidence is provided to support the predicted 'rapid recover'. It is our view that the removal/relocation of material at such a large scale may have an impact on the Annex I sandbank, the HHW SAC, sediment budget and dynamics.	The conservation objectives are considered within the Section 7 of the Information to Support HRA Report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Natural England advises that it would be helpful if the Rochdale Envelope can be refined further to inform a realistic WCS, particularly within the SAC in order to provide a more accurate assessment.	A detailed realistic WCS is provided in Section 7.3.2 of the Information to Support HRA Report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	The three phase construction is of concern given that the installation of the export cable is then spread over nearly double the duration three years from July 2024 – Jan 2027 during 15 months (as opposed to the Single Phase (14 months July 2024 – Jan 2026) and two phase construction (16 months from July 2024 – Dec 2025). We would	The Norfolk Vanguard project will be constructed in a maximum of two phases (Section 10.7.3.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			expect further details to be provided in order to determine the impacts to designated features i.e. would the SAC portion of cable be completed in one phase therefore minimising disturbance.	
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Consideration should be given to prey resource for red throated diver in the Greater Wash SPA.	Consideration of this is provided in section 10.6.6. The Information to Support HRA Report considers impacts to red-throated diver including consideration of impacts to their prey species.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It should be noted that Haisborough, Hammond and Winterton SCI was awarded full designation status in Nov 2017 and is now an SAC, this should be updated throughout.	This has been updated throughout the chapter.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	While we agree that understanding value is important, we do not agree that economic value should be included in assessment of nature conservation interest. It would seem more appropriate to include it within the socio-economic chapter.	Economic value has now been removed from the methodology Section 10.4.1.2.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	NE query whether the definitions for medium and low value are always appropriate. Nationally rare species and habitats designated within a protected site warrant more than a 'low' value.	Value definitions have been amended in Table 10.4.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It is noted that one area of medium <i>Sabellaria spinulosa</i> reef was found in the offshore cable corridor and one station in NV East array area was classified as low/medium reef. We advise the applicant that we would expect low, medium and high reef to be treated as Annex I reef in impact assessment.	Within this chapter and the Information to Support HRA Report all identified reef is treated as potential Annex 1 reef.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We agree with the need for a pre-construction survey to be undertaken not more than a year before start of construction to allow accurate micro siting of works away from areas of <i>Sabellaria</i> reef.	Noted.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It is acknowledged that there is ongoing analysis of NV geophysical data by Envision Mapping Ltd to determine the further presence of <i>Sabellaria spinulosa</i> reef. We welcome this further analysis given the high presence/potential of/for <i>Sabellaria</i> within the project boundaries.	This study was presented to Natural England at a meeting on the 31 st January 2018 and has been revised to take account of further advice provided by Natural England. The results are presented in Figure 10.12 and Appendix 7.2 of the Information to Support HRA Report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Paragraph 87 of the PEIR should be changed to reflect the presence of <i>Sabellaria</i> reef in the cable corridor.	This has been amended within this document.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We note that definitions of major and minor include reference to impact on the decision making process, moderate does not. We suggest that these definitions are standardised to all include understanding of impact of regulatory processes.	The moderate definition has been updated (Section 10.4.1.4).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	The embedded mitigation is welcomed by Natural England including the commitment to pre-construction surveys to inform the requirement for micro siting around Annex I habitat; commitment to bury cables to minimise the need to use cable protection and the disposal material remaining within the Haisborough, Hammond and Winterton SAC in order to replenish the sandbank features.	These mitigation measures are discussed in Section 10.7.1 and outlined in the Schedule of Mitigation (document 6.5).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We have concerns regarding the potential use of rock protection used within the SAC and in particular note the exception of cables buried at cable crossing locations. This remains a major concern for Natural England due to the introduction of hard substrata into a predominantly soft sediment environment designated for its Annex I Habitat in the forms of sandbank and reef habitat.	The impacts of cable protection on the conservation objectives of the SAC are included within the Information to Support HRA report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We question whether paragraph 102 of the PEIR is suggesting that material will be actually removed from the site during operations, or whether it is simply suggesting that material will be displaced during trenching / jetting operations.	Text has been amended to make clear that no sediment would be removed from the SAC. Appendix 8.1 demonstrates that sediment deposited back in the Haisborough Hammond and Winterton SAC would be incorporated back into the system.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	The WCS for cable protection allows for 4km of rock protection within the Haisborough, Hammond and Winterton SAC should cable burial not be possible. It is unclear whether any other options have been considered, i.e. different techniques for reburial, can the cable corridor be altered in order to allow the cable crossings to be made out with the SAC. From chapter 4 of the PEIR (Site selection and assessment of alternatives) it is clear that the determining factor of site selection has been the landfall, however additional information on the alternatives would be helpful including the following: location and feasibility of cable corridor in relation to geological features and seabed; location of cable crossings; and location of sensitive habitats. To provide these details where possible on one habitat map would help to inform the assessment.	One of the design principles when siting the offshore cable corridor was to avoid existing infrastructure to minimise the amount of cable protection required (see Chapter 4 site selection). The commitment to an HVDC transmission solution has reduced the WCS for cable protection within the SAC.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We suggest that paragraph 142 in the PEIR is reworded. Impact compared to available habitat in the southern North Sea is not a comparison that proves useful.	This has been amended within this chapter.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We are unsure as to why NBN, MarLIN, UKSeaMap and EMODnet have been given low confidence, given their well-audited quality assurance procedures.	The confidence levels in these data sources has been reassessed (section 10.5.2).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Other than the ABPmer (2012) modelling for East Anglia ONE regarding sediment plumes of 15 foundation installations, has any modelling of sediment plumes and disposal mounds been undertaken? It is acknowledged that effects are expected to be similar to that for the EA ONE modelling, but further detail is required in relation to impacts from smothering and sediment dispersion from installation techniques including the following: changes in sediment composition, and on current installation and cumulative impacts from suspended sediment. Figures demonstrating the range of impact and/ or a table displaying the changes in sediment composition would be helpful. This is particularly important in the Haisborough, Hammond and Winterton SAC.	As agreed through the EPP no site specific sediment plume modelling has been undertaken. A conceptual approach has been taken to predicting the likely deposition of material as a result of sediment plumes (Chapter 8 Marine Geology, Oceanography and Physical Processes).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We note a maximum potential export cable length within HHW SAC of approximately 40km per cable (240km based on six HVAC cables) with a maximum potential disturbance width of 30m along all 240km of export cables. This leads to a maximum area of disturbance of 7.2km ² . We also note that a similar level of impact will occur in the same area with later Norfolk Boreas operations, and this should be included in in-combination	Both Norfolk Vanguard and Norfolk Boreas have taken the decision to use HVDC technology. This has reduced the magnitude of impact by approximately two thirds. Furthermore, both projects will now be constructed in a maximum of 2 phases each thereby reducing the duration of impacts. This is shown in section 10.8.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			analysis to allow a full worst case scenario to be assessed. Further impact to the site is also likely to occur from maintenance activities on the cable route during operation.	
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We advise that the operation impact of long term loss of seabed habitat in the OWF sites should be defined further and should either be classed as long term temporary (acknowledging the need to remove at decommissioning) or permanent loss of habitat.	Operation impacts 1a and 1b have now been classified as permanent and are defined in Table 10.12 Worst Case Scenarios.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We advise that the operational impact of long term loss of seabed habitat in the OWF cable corridor should be classed as long term temporary loss of habitat with the commitment to remove cable protection at the time of decommissioning. However, it is acknowledged that removal at the time of decommissioning might not be anticipated in which case the impact should be considered long term permanent.	Operation impacts 1a and 1b have now been classified as permanent as it is recognised that it may not be possible to remove all cable protection during decommissioning and are defined in Table 10.12 Worst Case Scenarios.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We expect Vattenfall to consider the overall impact on the designated features of the site in deciding which methods to use to lay and stabilise cables, and encourage the operator to minimise the amount of hard substrate material used within the SAC. We note that the long-term effect of the introduction of hard substratum into naturally sandy or muddy sea beds is not fully understood at present, and should therefore be carefully considered by the regulators.	Norfolk Vanguard Limited has taken this into consideration and has taken the decision to use HVDC transmission technology for both Norfolk Vanguard and Norfolk Boreas. This has reduced the project WCS number of export cable trenches from 6 to 2 and the cumulative WCS from 12 to 4 cables, thereby reducing the possible introduced hard substrate by approximately two thirds.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	<p>We would expect further detailed commentary on stabilisation operations to allow further understanding of their actual nature conservation impact. This would include:</p> <ul style="list-style-type: none"> • Location of deposit sites in HHW SAC • Size / grade of rock to be used in HHW SAC • Tonnage / volume to be used in HHW SAC • Contingency tonnage / volume to be used in HHW SAC • Method of delivery to the seabed in HHW SAC • Footprint and structure of any other protection structure, e.g. mattresses / frond mattresses in HHW SAC. <p>We also expect some commentary on how precautionary the estimate of 4km of cable protection in HHW is.</p>	Further detail is provided within section 7.3.2 of the Information to Support HRA Report (document 5.3); the Site Characterisation Report (document 8.15) and the Scour Protection and Cable Management Plan (document 8.16).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	<p>It is It is stated under the NV West WCS that there will be no cable protection used within the Haisborough Hammond and Winterton SAC. However, throughout the PEIR project description chapter it is stated that 4km of rock protection has been included within the Rochdale envelope for use within the SAC should cable burial fail. Clarification needs to be provided. The WCS Scenario (section 10.7.2 has been updated to make clear exactly what the WCS is within the SAC.</p>	The WCS Scenario (section 10.7.2 has been updated to make clear exactly what the WCS is within the SAC.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	<p>We suggest that sensitivity analyses are reconsidered using the most up-to-date scientific evidence. This includes reports found in the following two links (eg Tillin and Tyler-Walters, 2014 a, b):</p> <ul style="list-style-type: none"> - http://jncc.defra.gov.uk/page-6929 - http://jncc.defra.gov.uk/page-6790 	<p>These reports have been used where possible however they assess the sensitivity of level 5 biotopes based on the species that define that level 5 classifications. Biotopes within the Norfolk Vanguard offshore project area have been defined to level 3 across the majority of the site as is appropriate for a characterisation survey and proportionate to the level of impacts likely to occur. Where level 5 biotopes have been identified these reports have been used to help determine sensitivity.</p>
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	<p>We have concerns about impacts to potential areas of Sabellaria spinulosa reef. One area of Sabellaria spinulosa reef (of medium reefiness) and other small aggregations of the species (not reef) were found to occur within the SAC within the boundaries of the cable corridor. We note that it is concluded as a minor adverse impact and highlight that the Conservation Objectives of the designated features should be considered when assessing the sensitivity and vulnerability and thus drawing conclusions on significance. The use of the EIA matrices is helpful, but additional consideration is required to consider the sensitivity from a HRA perspective. We wish to highlight that as an Annex I habitat of a designated site, all impacts should be avoided where possible and therefore we would advise micro-routing the cable around confirmed areas of reef.</p>	<p>The Conservation Objectives of the designated features of the SAC are considered in terms of their sensitivity and vulnerability within the Information to Support HRA Report (document 5.3).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We do not believe that using percentage of site impacted is a meaningful way to assess level of impact to the SAC. Please see Chapman and Tyldesley (2015) for further discussion of this. As such we do not necessarily agree with the applicant's conclusion of low magnitude. Comparing the impact to that of another industry does not provide a meaningful assessment of impact and we advise that further consideration of impact and recoverability is included once the applicant adjusts their magnitude scales.	The advice provided here is considered within the Information to Support HRA Report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Paragraph 153 of the PEIR suggests that there is only a small area of Annex I sandbanks at the edge of the offshore cable route. We disagree with this conclusion as, from images provided, the cable route crosses at least two major sandbanks within HHW. We agree that the sandbanks are mobile, but we also disagree with the applicant's consideration that that seems to remove Annex I sandbanks from the need for impact assessment, only including the benthic communities of the Annex I sandbank habitat. We expect full consideration of impact to Annex I sandbanks within future documentation. We further disagree that having a feature with low diversity correlates with a conclusion of low sensitivity.	Impacts to Annex 1 sandbanks within the SAC are assessed against the conservation objectives in the Information to Support HRA Report (document 5.3). This includes an assessment of the potential impacts to the benthic communities associated with the sand banks (Section 7.4.1.1.1 of the Information to Support HRA Report). The relevant paragraph within this chapter has been updated to reflect the advice provided.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It is noted that cable protection within the Haisborough, Hammond and Winterton SAC will be minimised. We advise that the use of cable protection is avoided and where it isn't possible the impacts to <i>Sabellaria spinulosa</i> should be minimised and the cable protection removed at the time of decommissioning. We are currently	The advice provided here is considered within the Information to Support HRA Report (document 5.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			uncertain as to the protected status of <i>Sabellaria</i> reef on artificial substrates / infrastructure, and thus are uncertain of the potential impact associated with micro siting as described in paragraph 225 of the PEIR.	
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Assessment of the operation and maintenance activities should also consider the impact from recurring temporary habitat loss and disturbance as a result of remedial cable works and repair as well as the use of jack up vessels. The repeated activities will hinder the further establishment or recovery of <i>Sabellaria spinulosa</i> . We advise that a survey prior to any works in areas of suitable <i>Sabellaria spinulosa</i> habitat both within and out with the SAC should be undertaken to help inform the works and ensure any necessary mitigation is implemented where possible.	The potential impacts of maintenance activities on the recovery of <i>Sabellaria</i> reef within the SAC is considered in Section 7.4.1.1.2 of the Information to Support HRA Report (document 5.3) and outside of the SAC in section 10.7.5 of this chapter.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	It is reported that the cable corridor footprint overlaps with the Cromer Shoal Chalk Beds MCZ – however according to chapter 5 and chapter 10 of the PEIR the latest site selection avoided overlap with the MCZ. It is advised that clarification be provided.	The offshore cable corridor is approximately 60m to the south of the MCZ (Figure 10.13).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	We query whether the inclusion of Annex B (correspondence between ourselves and Vattenfall regarding the review of geophysical and grab sampling impact assessment) is necessary and request that it is removed from the application.	This correspondence has been removed from the DCO application.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	In addition to provision of a pre-construction installation method final report, there would need	An In Principle Monitoring Plan (document 8.12) is submitted with the DCO application. The details of monitoring would be determined based on the final

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			to be a survey, mitigation plan and reinstatement plan associated with this.	design of the project in consultation with relevant Regulators and stakeholders.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	With regard to HRA Screening; overall NE agrees with the sites that have been screened in. However, we can't provide any further advice until the impacts have been assessed. The assessment of the impacts need to be undertaken in the specific thematic chapters and then pulled together in the RIAA for additive impacts to each interest feature from the project as a whole.	A draft HRA report was provided to Natural England in March 2018. The final Information to Support HRA Report is submitted as part of this DCO application.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Should be referred to as "to seek advice from <u>the relevant SNCB Natural England</u> ". This applies throughout all documents.	This has been amended throughout this chapter.
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Natural England advises that the conservation advice packages for the sites should be taken into consideration at the screening stage to ensure that no impact pathways have been missed.	The conservation objectives of relevant sites are taken into consideration in the Information to Support HRA Report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	English Nature and subsequently Natural England's advice is that foreseeable plans or projects for which there is relevant information in the public domain in order to undertake an impact assessment should also be included in the in-combination assessment.	Consultation, undertaken through the EPP has been used to identify all foreseeable projects which may interact with Norfolk Vanguard (Section 10.8 within this chapter and section 7.4.1.2 in the Information to Support HRA report, document 5.3).
Chapter 10 Benthic and Intertidal Ecology	Natural England	11th December 2017	Natural England challenges the assumption that the impacts will be small scale to designated features as there is no evidence to support such an assumption. In addition it is worth highlighting that in the past case law has challenged the consideration of extent only.	The advice provided here is considered within the Information to Support HRA Report (document 5.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	The Wildlife Trusts	8th December 2017	TWT has concerns regarding the cumulative impacts of repeated cable installation and suggest further work is required on the cumulative impacts of Norfolk Vanguard and Norfolk Boreas. There is an opportunity to reduce cumulative impacts by considering embedded mitigation such as planning the cabling infrastructure in advance for both projects.	Following the commitment of both projects to HVDC transmission technology the cumulative impacts have been greatly reduced. Further work has been undertaken to understand the cumulative impacts especially within the SAC Appendix 8.1 of the ES and Appendix 7.2 of Information to inform HRA (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	The Wildlife Trusts	8th December 2017	We do not agree with some of the assessment conclusions for Haisborough, Hammond and Winterton SAC. However, we appreciate that a Habitats Regulations Assessment (HRA) will be undertaken against the conservation objectives for this site using the conservation advice.	The advice provided here is considered within the Information to Support HRA Report (document 5.3).
Chapter 10 Benthic and Intertidal Ecology	The Wildlife Trusts	8th December 2017	TWT disputes paragraph 152 of the PEIR <i>“The seabed is likely to rapidly recover from the temporary disturbance with the impacts likely to be akin to those which are perpetrated by bottom towed fishing gear which is known to operate within the area”</i> .	Acknowledged.
Chapter 10 Benthic and Intertidal Ecology	The Wildlife Trusts	8th December 2017	TWT disputes Paragraph 156 of the PEIR <i>“Given that the benthic communities within the export cable corridor are habituated to regular disturbance from bottom trawled fishing gear, the sensitivity of benthic communities to the increased temporal nature of the impact would not differ from those assessed in Section 10.7.3.2 above”</i> .	Acknowledged.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	The Wildlife Trusts	8th December 2017	The conservation advice for Haisborough, Hammond and Winterton SAC states “fisheries using bottom towed gear are active in the site. This may impact biological communities through habitat modification and/or catching of both target and non-target species”, highlighting that the SAC may be already disturbed from fishing activity rather than habituated to this activity. For information, Eastern IFCA is currently reviewing the management of fisheries within the SAC. Further consideration of the recovery from temporary disturbance should be undertaken as part of the HRA assessment.	This has been further discussed through the Norfolk Vanguard EPP and is considered within the Information to Support HRA Report (Document 5.3).
Chapter 10 Benthic and Intertidal Ecology	The Wildlife Trusts	8th December 2017	Please could Vattenfall confirm if modelling has been undertaken to confirm the prediction made in paragraph 164 of the PEIR on the impacts of distance and thickness of deposit from the sediment plume?	No site specific modelling has been undertaken. As agreed through the EPP modelling undertaken for East Anglia ONE has been used to develop a conceptual understanding of the potential sediment plumes.
Chapter 10 Benthic and Intertidal Ecology	Eastern IFCA	11th December 2017	The Eastern IFCA would encourage further assessment on an ongoing basis of the cumulative impacts of all Southern North Sea wind farm activity, as well as other activities including aggregate extraction activities. The impacts of these projects on the marine environment and fisheries should be assessed in-combination, highlighting any potential cumulative effects associated with the licence application.	This is understood, however this is not within the remit of a single project and would need to be undertaken at a strategic level and under the guidance of Regulators.
Chapter 10 Benthic and Intertidal Ecology	Eastern IFCA	11th December 2017	Every effort should be made to maximise the length of cables that are buried and maintain burial over time. Using cable armouring instead of cable burial increases the likelihood of adverse environmental and fishery impacts.	Norfolk Vanguard Limited will seek to bury cables wherever possible.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	Given that the sensitivities of many of the characteristic species are not known, the applicant should detail how the confidence rating (high = robust evidence – low = extrapolation and use of proxies) has been used to provide the overall significance assessment for each habitat.	The impact assessment has a confidence rating in the conclusion of each impact.
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	An assessment of the sensitivity of the Annex I sandbanks must consider infauna, epi-fauna and fish communities together. Although infaunal diversity may be low, the sandbanks may be important habitat (nursery/feeding) for epi-fauna and fish species (e.g. Sand eel (<i>Ammodytes spp</i>), Lesser weever (<i>Echichthys vipera</i>) etc). An overall assessment of significance, considering all these trophic groups, should be undertaken for protected habitats within the SAC.	An assessment of the sensitivity of Annex I sandbanks with the HHW SAC is undertaken within the Information to Support HRA Report (Document 5.3). This includes consideration of the benthic communities which exist on and between the sandbanks. The assessment of impacts on fish is assessed in Chapter 11 Fish and Shellfish Ecology.
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	As well as embedded mitigation to avoid the Cromer shoal chalk reef, the possibility of micro-siting following pre-construction survey should be incorporated to avoid areas of Annex I reef.	Norfolk Vanguard Limited has committed to micro-siting where possible to avoid sensitive features. This has been made more achievable given Norfolk Vanguard Limited's decision to use to HVDC technology which reduces the number of export cables from 6 to 2.
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	The MMO would welcome a commitment to ensure that the burial of offshore export cables reduces the effects of EMF and the need for surface cable protection.	Norfolk Vanguard Limited has made the decision to bury cables wherever possible.
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	Where sandbanks are a feature, material removed to allow for cable burial should be used to replenish the sandbank.	Norfolk Vanguard Limited has committed to ensuring that all sediment removed from sandbanks will remain within the SAC, thereby replenishing the sand banks (further information is provided in Appendix 8.1

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	Commitment to adhere to the use of best practice techniques to minimise the risk of spreading non-native invasive species is requested.	Outlined in Section 10.7.1.10. These commitments would be secured in the Project Environmental Management Plan (required under condition 14(1)(d) based on the Outline Construction Environmental Management Plan (document 8.14) provided with the DCO application.
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	Commitment to further monitor habitats of principle importance (UK BAP habitats) and Annex I reef identified in the pre-construction survey, to ensure that any impacts due to placement of the turbines do not exceed those predicted in the Environmental Statement, is required.	An Offshore In Principle Monitoring Plan forms part of the DCO application (Document 8.12). This document identifies relevant offshore monitoring as required by the deemed marine licence conditions, establishes the objectives of such monitoring and sets out the guiding principles for delivering any monitoring measures as required.
Chapter 10 Benthic and Intertidal Ecology	MMO	11th December 2017	Commitment to monitoring the effects of cable protection on sandbank and reef communities as any barrier to sediment movement could be detrimental to maintaining these features, is required.	An Offshore In Principle Monitoring Plan forms part of the DCO application (Document 8.12). This document identifies relevant offshore monitoring as required by the deemed marine licence conditions, establishes the objectives of such monitoring and sets out the guiding principles for delivering any monitoring measures as required.

Feedback related to Marine Mammals (Chapter 12 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	Further justification and confirmation regarding the use of certain data sets and evidence is required, in addition to a detailed impact assessment of Unexploded Ordnance (UXO) detonation.	Underwater noise modelling for UXO clearance at Norfolk Vanguard has been conducted and included in the ES – Section 12.7.3.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Natural England particularly keen to have further discussions regarding the strategic approach proposed to mitigate the impacts to the Southern North Sea harbour porpoise cSAC. Natural England advise that a range of scenarios should be used to provide a greater level of confidence when assessing (a) the underwater noise impacts and proportion of population impacted and (b) the density estimates of the MU ref population.</p>	<p>Acknowledged and further discussions regarding the strategic approach proposed to mitigate the impacts to the Southern North Sea harbour porpoise cSAC will be conducted with the SNCBs and MMO.</p> <p>The assessments have included, where applicable a range of scenarios, which have (a) included the potential proportion of North Sea MU population that could be impacted; and (b) the density estimates for the Norfolk Vanguard site and latest SCANS-III density estimate. The density estimates of the MU ref population are over a wide scale and were deemed not appropriate to use, but assessments have been based on the North Sea MU abundance estimate.</p>
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Discussions will be ongoing regarding some outstanding concerns including (but not limited to):</p> <ul style="list-style-type: none"> • the use of a spatial or population-based assessment within the HRA; • the use of a 5% threshold at HRA, and • whether the use of SCANS III population is appropriate to use. 	<p>Addressed in the Information to Support HRA Report (document 5.3).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Data use: The Management Unit population is the appropriate population for percentage impacts to the population to be assessed against throughout the assessment. Following further discussion on the teleconference call on the 8th December 2017 we will provide further confirmation as to whether the SCANS III population is appropriate to in our technical advice note that we will be providing by 5th January 2018. It should also be noted that the site selection document for the Southern North Sea cSAC states it is estimated the site supports approximately 18,500 individuals and this number should not be referred to as an estimated population. Natural England also wish to highlight that the Lincolnshire Wildlife Trust conduct grey seal counts at Donna Nook annually and this data is widely available.</p>	<p>The North Sea MU population of 345,373 (CV = 0.18; 95% CI = 246,526-495,752; Hammond et al., 2017) based on the SCANS-III data, has been used as the reference population throughout the assessment. NE confirmed (letter date 03/01/18; Point 2) that it is appropriate to use the SCANS-III population data (Hammond et al., 2017) as the same area is used as the Management Unit.</p> <p>It is acknowledged that, as outlined in Section 12.6.1.4, it is not appropriate to use SNS cSAC site population estimate in any assessments of effects of plans or projects, as these need to take into consideration population estimates at the MU level (JNCC, 2017b). However, as requested by TWT and WDC, an additional assessment has been included in Appendix 12.4, for information, based on the estimate that the SNS cSAC could support 29,384 harbour porpoise (SCANS-III data for 17.5% of the UK North Sea MU).</p> <p>The data from the most recent seal counts has been updated.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>UXO assessment: Further consideration is required regarding the UXO assessment, including the following:</p> <ul style="list-style-type: none"> • Consideration of a larger number/size of bombs; • The use of more appropriate examples of UXO assessments rather the Beatrice Offshore Wind Farm (BOWL) i.e. East Anglia ONE; • Noise modelling should be undertaken and the NMFS (2016) unweighted Peak SEL metric be used to ascertain the potential zone of PTS; • Consideration of the UXO works within the RIAA, and • The design of a Marine Mammal Mitigation Protocol (MMMP) for UXO 	<p>Underwater noise modelling for UXO clearance at Norfolk Vanguard has been conducted and included in the ES – Section 12.7.3.1.</p> <p>This includes the NMFS (2016) unweighted Peak SEL metric to assess the potential PTS range and impact area.</p> <p>The assessment of the potential UXO at Norfolk Vanguard has included a strategic UXO risk management assessment (Ordtek, 2018) as outlined in section 12.7.3.1.</p> <p>UXO clearance effects will be assessed in the information for the HRA.</p> <p>As outlined in section 12.7.3.1.6 and 12.11.1.2, a UXO clearance MMMP would be produced post-consent in consultation with Natural England and will be based on the latest scientific understanding and guidance, pre-construction UXO surveys at the Norfolk Vanguard offshore project area, and detailed project design. The MMMP will detail the proposed mitigation measures to reduce the risk of any lethal injury and permanent auditory injury to marine mammals during any underwater detonations.</p>
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Strategic Approach: Natural England welcomes the opportunity for further discussion with Vattenfall regarding a Site Integrity Plan and a possible strategic approach to mitigation as part of the Evidence Plan Process.</p>	<p>Acknowledged and further discussion regarding the Site Integrity Plan and a possible strategic approach to mitigation will be conducted with the SNCBs and MMO.</p>
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Permanent Threshold Shift in seals: It is reported in para 425 that the SEL_{cum} for PTS in seals is 21km, which would in turn imply that the mitigation zone would also need to be 21km. We query whether this is correct given the low</p>	<p>As agreed, assessments in the ES are based on NMFS (2016) thresholds for PTS and TTS and Lucke <i>et al.</i> (2009) threshold for possible avoidance (with the additional assessments based on Southall <i>et al.</i> (2007) included in Appendix 12.5).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			frequency of seals and the fact that it's far greater than the other PTS results for harbour porpoise.	
Chapter 12 Marine Mammals	Natural England	11th December 2017	Disturbance range of 26km for seals (para 462): Whilst Natural England are content for the proposals of a 26km disturbance range to be used for seals as well as harbour porpoise Natural England wish to highlight that further justification and clarification as to why this is being used would be helpful and advise that it is made clear within the application that this is not necessarily Natural England's advice.	Further justification based on Russell et al. (2016) has been included in section 12.7.3.2.4. It is acknowledged that this is not Natural England's current advice but that its use is accepted.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Density estimates of the MU ref population: (para 725): We advise that a range of density estimates should be presented. This will provide a greater level of confidence in the assessment acknowledging that the SCANS data provides just a snapshot in time and highlighting that the winter population of the cSAC could therefore be far higher than assessed.	A range of density and abundance estimates have been reviewed in Section 12.6.1.1.3 for harbour porpoise. Potential impacts have been based on the highest site specific survey density estimates and the SCANS-III survey density estimate, throughout the assessment.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Underwater noise impacts: Following the call on the 8 th Dec 2017 we wish to reiterate that it would be most appropriate to present a range in relation to the proportion of the population impacted: for example at 50%, 75% and 100%.	As agreed, a range (50%, 75% and 100%) in relation to the proportion of the population impacted has been included in Section 12.7.3.2.5 Table 12.50 for possible avoidance.
Chapter 12 Marine Mammals	Natural England	11th December 2017	HRA - Threshold of 5%: Following the call on the 8th Dec 2017 Natural England are having further internal discussions regarding this issue and will provide a further technical advice note by the 5th January 2018.	Addressed in the Information to Support HRA Report (document 5.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	HRA - spatial vs population level assessment: Following the call on the 8th Dec 2017 Natural England are having further internal discussions regarding this issue and will provide a further technical advice note by the 5th January 2018 and will confirm that we are content with the summer and winter areas proposed for assessment.	Addressed in the Information to Support HRA Report (document 5.3).
Chapter 12 Marine Mammals	Natural England	11th December 2017	This paragraph states the Management Unit (MU) is the appropriate scale, at which effects of projects and plans should be assessed, yet they are not included in the rest of the assessment as a reference population for HP and there is no explanation as to why the SCANS III NS AU has been chosen instead? Natural England considers the MU population to be the appropriate population for percentage impacts to the population to be assessed against throughout the assessment.	The SCANS-III survey area for the North Sea, the combined area of the aerial survey blocks used is very similar (within a few percent) to the area of the AU, which is the same as North Sea MU. As outlined below, NE confirmed (letter date 03/01/18; Point 2) that it is appropriate to use the SCANS-III population data as the same area is used as the Management Unit. The North Sea MU population of 345,373 (CV = 0.18; 95% CI = 246,526-495,752; Hammond et al., 2017) based on the SCANS-III data, has been used as the reference population throughout the assessment.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Please can the text be changed here to reflect that the site selection document for the Southern North Sea cSAC states it is estimated the site supports approximately 18,500 individuals and this number should not be referred to as an estimated population. Natural England therefore considers it not appropriate for percentage impacts to the cSAC 'population' to be presented throughout the assessment as this is very misleading.	Text has been amended to: The SNS cSAC Site Selection Report (JNCC, 2017b) identifies that the SNS cSAC site supports approximately 18,500 individuals (95% CI = 11,864 - 28,889) for at least part of the year (JNCC, 2017b). However, JNCC (2017b) states that because this estimate is from a one-month survey in a single year (the SCANS-II survey in July 2005) it cannot be considered as an estimated population for the site.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England welcomes that consideration will be given to grey seal as part of the North Norfolk Coast SAC or Horsey-Winterton SAC in the HRA, to determine if there is the potential for any disturbance, despite them not being a designated feature of either site. However, it is noted that this then conflicts with Appendix 10.4. - is it therefore assumed that the seals around Norfolk are part of the designated population of the Humber SAC?	For the assessment in the ES the south-east management unit has been used as the reference population, rather than individual site numbers / counts.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England queries the statement that there are no recent counts for the number of grey seal in the Humber Estuary SAC. Lincolnshire Wildlife Trust conduct counts at Donna Nook annually and this data is widely available. The meaning of this statement should be clarified if these counts are not what was intended.	Text has been clarified in section 12.6.4.3 on the MUs and site counts used in the assessments for the HRA.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England welcomes the commitment from Vattenfall to further discussions with Natural England on the appropriate mitigation zone and methods for achieving full mitigation of that zone.	Acknowledged.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Natural England considers the UXO assessment undertaken in section 12.7.3.1 to be confusing. It is not clear why the assessment from Beatrice Offshore Wind Farm (BOWL) has been used as a substitute for an assessment at Vanguard. Natural England consider it highly likely, based on the recent experience of other offshore wind farms in the southern North Sea, that a larger number of larger bombs are likely to be present in the vicinity of Vanguard than BOWL. Natural England considers there are more appropriate examples of UXO assessments that are more relevant to Vanguard that could be used instead.</p> <p>In paragraph 332 it states that BOWL assessed the potential for physical injury based on the peak sound pressure (SPL) threshold of 240 dB for all marine mammals from Yelverton et al., 1973. Natural England's current advice regarding assessment of potential impacts from UXO detonations is that noise modelling should be undertaken and the NMFS (2016) unweighted Peak SEL metric be used to ascertain the potential zone of PTS as these criteria represent the current best available evidence on noise metrics.</p> <p>Again the detonation of UXO is likely to have a significant effect on the interest features of the Southern North Sea cSAC and therefore should be included in the RIAA.</p>	<p>Underwater noise modelling for UXO clearance at Norfolk Vanguard has been conducted and included in the ES – Section 12.7.3.1. This replaces the assessment based on the Beatrice Offshore Wind Farm.</p> <p>As outlined above, the modelling includes the NMFS (2016) unweighted Peak SEL metric to assess the potential PTS range and impact area.</p> <p>The assessment of the potential UXO at Norfolk Vanguard has included a strategic UXO risk management assessment (Ordtek, 2018) as outlined in section 12.7.3.1.</p> <p>UXO clearance effects will be assessed in the information for the HRA.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Natural England queries the use of metrics from Parvin et al., (2007) as described in paragraph 380. This work considers impacts to both fish and marine mammals using the same metrics and Natural England do not consider them to be the most appropriate to be used in a marine mammal assessment. It is not clear what value they add to the assessment when the NMFS (2016), Southall et al., (2007) and Lucke et al., (2009) are all being considered in the assessment.</p> <p>Following the call on the 8th Dec 2017 we acknowledge Vattenfall's commitment to removing reference to this paper for the application.</p>	<p>As agreed the assessment based on the metrics from Parvin et al. (2007) has not been included in the ES or Appendix 12.5 with additional assessments.</p> <p>As agreed, assessments in the ES are based on NMFS (2016) thresholds for PTS and TTS and Lucke et al. (2009) threshold for possible avoidance (with the additional assessments based on Southall et al. (2007) included in Appendix 12.5).</p>
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Natural England welcomes the proposed extended ramp-up period to allow animals to move further away.</p>	<p>Acknowledged.</p>
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>In addition to the text presented under Figure 4.2 in Appendix 5.1, Natural England would welcome further explanation of the use of data from 7m diameter piles as a proxy for 8.5m or 15m diameter piles in the noise modelling.</p>	<p>As outlined in the underwater noise note (8th December 2017), the pile diameter is used for estimating the frequency content of the noise; large monopiles produce more low frequency content and the smaller pin piles contain more high frequency content, due to the dimensions and acoustics of the pile.</p> <p>For offshore piling modelling, frequency data has been sourced from Subacoustech's noise measurement database and an average taken to obtain representative third octave (i.e. frequency) levels for installing monopiles and pin piles. The frequency spectrum for a pile of 7.0m in diameter is suitable for the monopile modelling and piles of approximately 4.0m in diameter have been used for pin pile modelling.</p>

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Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England queries the approach of incorporating the length of pile in contact with the water in to the model as this would change over the course of a monopile foundation being installed. Further explanation of this point would be welcomed.	As outlined in the underwater noise note (8 th December 2017), the radiating pile length in the water would not change, provided that the hammer remains above the surface of the water. Investigations with limited data for subsea piling have shown that the difference to the situation where the hammer is above the water is small. It is thought that, while the radiating area would progressively reduce for subsea hammer piling, the introduction of the hammer itself would contribute to the noise, perhaps offsetting the effect.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England considers that all reference to percentage of the SNS cSAC population impacted should be removed. As previously mentioned, there is no population estimate for the SNS cSAC and presenting results in this way is misleading.	Reference to cSAC 'population' has been removed from ES chapter, with an additional assessment included in Appendix 12.4, for information, based on the estimate that the SNS cSAC could support 29,384 harbour porpoise (SCANS-III data for 17.5% of the UK North Sea MU).
Chapter 12 Marine Mammals	Natural England	11th December 2017	Again, reference to the SNS cSAC population should not be included here as there is no population estimate for the SNS cSAC. Rather, the spatial impact of concurrent piling scenarios should be considered in line with the SNCB threshold approach.	It is acknowledged that, as outlined in Section 12.6.1.4, it is not appropriate to use SNS cSAC site population estimate in any assessments of effects of plans or projects, as these need to take into consideration population estimates at the MU level (JNCC, 2017b). However, as requested by TWT and WDC, an additional assessment has been included in Appendix 12.4, for information, based on the estimate that the SNS cSAC could support 29,384 harbour porpoise (SCANS-III data for 17.5% of the UK North Sea MU). In the ES, the spatial impact has been put into the context of the North Sea MU harbour porpoise population of 345,373 (CV = 0.18; 95% CI = 246,526-495,752; Hammond et al., 2017) based on the SCANS-III data, which has been used as the reference population throughout the assessment. In the HRA, the spatial impact has been assessed in

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				relation to the area of the SNS cSAC, following the current statutory nature conservation body (SNCB) threshold approach.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England queries if the additional vessel movements could be represented as a percentage increase from baseline to allow a better understanding the level of increase.	Vessel movements as a percentage increase from baseline has been included in the assessment (section 12.7.3.4).
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England queries where an avoidance rate of 95% has come from? As agreed on the call on the 8th Dec 2017, Vattenfall have agreed to include further justification for the use of this avoidance rate.	Further information and justification for the avoidance rate has been included in section 12.7.3.6.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England notes that the majority of operational turbine noise measurements were taken during Round 1 and therefore do not capture the subsequent increases in turbine size and developments or changes in the design and engineering of turbines. We would welcome further work to be undertaken to monitoring the operational noise of larger turbines to update the evidence in this area and our understanding of it.	Acknowledged.

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Chapter 12 Marine Mammals	Natural England	11th December 2017	It is not clear in this section what the reference population is for the assessment. Paragraph 673 states the MU is used as the population reference area but then results are provided in the context of the SCANS III North Sea Assessment Unit. As previously stated, Natural England consider the MU to be the appropriate reference population and assessment results should be presented in the context of the MU population.	The North Sea MU population of 345,373 (CV = 0.18; 95% CI = 246,526-495,752; Hammond et al., 2017) based on the SCANS-III data has been used as the reference population throughout the assessment. As outlined below, NE confirmed (letter date 03/01/18; Point 2) that it is appropriate to use the SCANS-III population data as the same area is used as the Management Unit.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England is not quite sure which advice note is being referred to here, but it should be noted that the advice quoted here is SNCB advice and not just that of Natural England.	Amended.
Chapter 12 Marine Mammals	Natural England	11th December 2017	It is not clear why the UK and European OWF sites have been separated in to two different tables? If they are being assessed together, Natural England consider it would be much less confusing for them to be tabulated together.	Amended.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England request that clarity is provided for the first bullet point as to what is considered a 'marine renewable development' as this technically includes OWFs but these are listed separately in the preceding paragraph.	Amended.
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England appreciate it is difficult to know at this time how many UXO detonations may be required prior to commencement or UXO survey works. However, we consider it to be possible to assess a certain quantity of detonations based on experience of similar sized projects in the southern North Sea.	The CIA is based on the number of potential UXO detonations that could potential occur at the same time, not the number of UXO that could be present with each site. The assessment of the potential UXO at Norfolk Vanguard has included a strategic UXO risk management assessment (Ordtek, 2018) as outlined in section 12.7.3.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Natural England	11th December 2017	Natural England welcomes the opportunity for further discussion with Vattenfall regarding a Site Integrity Plan and a possible strategic approach to mitigation as part of the Evidence Plan process.	Further discussions regarding the Site Integrity Plan and a possible strategic approach to mitigation are ongoing with the SNCBs and MMO. The draft SIP has been issued to ETG and submitted with the DCO application (document 8.17).
Chapter 12 Marine Mammals	Natural England	11th December 2017	<p>Natural England would welcome the opportunity to work with Vattenfall on the Marine Mammal Mitigation Protocol (MMMP) for UXO as well as the MMMP for piling.</p> <p>These sections state that the maximum impact to seals is TTS to 5.4 km based on the Southall et al (2007) criteria of 171 dB SEL. However, table 12.39 of Chapter 12 states the maximum impact to seals is PTS to 21km based on the Southall et al (2007) criteria of 186 bid SELcum. Clarification should be provided as to why this figure was not used in the screening.</p>	<p>Further discussion regarding the MMMP will be conducted with the SNCBs and MMO.</p> <p>A draft MMMP for piling (document 8.13) is submitted with the DCO application</p> <p>The initial underwater noise modelling for the HRA screening was updated for the PEIR and has since been updated for the ES, to reflect changes in the project, updates in the modelling and EPP discussions.</p> <p>Therefore there are differences between the different documents produced at different stages of the project. As outlined above, the current advice from Natural England is to use the NOAA (NMFS, 2016) thresholds and criteria.</p>
Chapter 12 Marine Mammals	MMO	11th December 2017	Mitigation in all chapters, whilst reasonable, is generally of a standardised nature. The MMO would appreciate the opportunity to input into specific mitigation issues when further details emerge. At this stage, it has been difficult for the MMO and its advisers to fully assess the appropriateness of mitigation due to the generalised nature.	A draft MMMP for piling (document 8.13) and In Principle SIP (document 8.17) are submitted with the DCO application to outline the specific mitigation measures in relation to marine mammals.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	MMO	11th December 2017	There is scarce information regarding assessed impacts regarding activities relating to the windfarm that is not construction and to a lesser extent operation. Related activities such as UXO clearance and boulder clearance and cable repair will inevitably be part of the impact of the whole project and should be given further consideration. For instance, we note that UXO activities have been included in noise modelling but not included in wider activities in the time line of the project. The MMO recommends that as much peripheral but essential activities are included in the assessment as possible to fully understand the impact of the whole project.	Underwater noise modelling for UXO clearance at Norfolk Vanguard has been conducted and included in the ES – Section 12.7.3.1. Noise from other construction activities, such as cable installation, has been assessed in section 12.7.3.3. Vessel noise has been assessed in section 12.7.3.4. Operational noise has been assessed in section 12.7.4.1.
Chapter 12 Marine Mammals	MMO	11th December 2017	With regard to impacts on designated areas, namely the southern North Sea candidate Special Area of Conservation (cSAC), we defer to Natural England, as the statutory nature conservation body (SNCB). However, the MMO require a more detailed assessment of the potential impacts of the Project as required under the Conservation of Habitats and Species Regulations (2017) taking into account the conservation status and conservation objects of the site. The assessment must consider the proposed activities and either conclude with absolute certainty that there will be no Likely Significant Effects or assess the impacts through an Appropriate Assessment.	This has been as assessed as part of the information for the HRA.
Chapter 12 Marine Mammals	MMO	11th December 2017	The MMO notes Vattenfall have followed the methodology approved through the evidence plan process.	Acknowledged.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	MMO	11th December 2017	Other noise generating activities such as increased vessel traffic, seabed preparation, rock dumping and cable installation should be assessed as well as impact piling which it is recognised will generate the highest level of underwater noise. The MMO notes that UXO noise has been included in the noise modelling however all operational and peripheral activities should be included in the assessment.	Underwater noise modelling for UXO clearance at Norfolk Vanguard has been conducted and included in the ES – Section 12.7.3.1. Noise from other construction activities, such as cable installation, has been assessed in section 12.7.3.3. Vessel noise has been assessed in section 12.7.3.4. Operational noise has been assessed in section 12.7.4.1.
Chapter 12 Marine Mammals	MMO	11th December 2017	The MMO recommends that Vattenfall continue to employ NOAA guidance as adopted by Natural England and the Joint Nature Conservation Committee.	As agreed through the EPP, the NOAA (NMFS, 2016) thresholds and criteria have been used in the assessment for PTS and TTS in the ES chapter. The PTS/TTS thresholds from Southall et al. (2007) and Lucke et al. (2009) have been included in the additional assessments in Appendix 12.5.
Chapter 12 Marine Mammals	MMO	11th December 2017	Overall, an informative noise report has been produced detailing the fleeing animal models that have been used for marine mammals and fish, the propagation model and model parameters including the frequency content, environmental conditions and source levels. The propagation loss model used is an energy model. Therefore, it is not clear how the SPLpeak is derived, or how the maps in Figures 5-1 to 5-4 are produced within the PEIR. This should be clarified.	The model used is a combination parabolic equation/ray-tracing solution, and derives the SPLpeak levels from our noise measurement database that collects piling noise data, including measured SPLpeak and SEL, from over 50 datasets.
Chapter 12 Marine Mammals	MMO	11th December 2017	Figure 5-5 in the PEIR illustrates that the noise from pin piles contains more high frequency components than the noise from monopiles. It also shows the sound frequency spectra for monopiles and pin piles, adjusted (weighted) to account for the sensitivities of medium and high frequency cetaceans. These levels can be compared to the original unweighted frequency	The SEL metric is weighted to calculate the effects on marine mammals to NMFS or Southall guidelines. The graphs in Figure 5-5 of Appendix 5.1 are illustrative of the effect of the weighting and not used in the assessment, and we agree that SEL would be more relevant in this graph.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			spectra in Figure 4-2 (shown faintly in Figure 5-5, below for reference). However, the levels provided in the figure are SPL _{peak} . The MMO understands the application of weighting is relevant for energy (or sound exposure level) but not for SPL _{peak} . This should be clarified.	
Chapter 12 Marine Mammals	MMO	11th December 2017	Furthermore, it is not clear whether this weighting has been used in the actual modelling, or if it has just been used for illustration purposes in Figure 5-5. This should also be clarified.	All the NMFS modelling that uses these weightings for its cumulative criteria and are denoted as “weighted SELcum”. The SPL _{peak} data in Figure 5-5 of Appendix 5.1 are for illustrative purposes only.
Chapter 12 Marine Mammals	MMO	11th December 2017	The MMO has encountered a situation where soft starting procedures have not been possible where the piling operations have been interrupted. The MMO require that this issue is considered during the development of marine mammal mitigation. Likewise there have been issues with specific levels of soft start (10% of maximum hammer energy) not being feasible in practice and this should be taken in to account. The proposed mitigation included in the Marine Mammal Protocol will need to be supported with robust evidence.	Marine mammal mitigation will be developed through the MMMP in consultation with the MMO.
Chapter 12 Marine Mammals	MMO	11th December 2017	A minor point is that the model uses two solvers, one for low frequencies and one for higher frequencies. An assumption has been made that the propagation loss model uses the parabolic equation up to the first 1/3 octave band centred at 250 Hz, and the ray tracing method from the next 1/3 octave band centred at 315 Hz. Please confirm this.	This is correct for the modelling used in the ES (however this is not relevant to the INSPIRE modelling , which is a semi-empirical solution rather than purely numerical solvers.)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	MMO	11th December 2017	In addition to the mitigation already mentioned including soft start and 24 hour working, a Marine Mammal Mitigation Plan (MMMP) will be developed in consultation with key stakeholders. This will include monitoring where appropriate.	As outlined in section 12.11.1, the MMMP for piling will be developed in the pre-construction period and based upon best available information and methodologies. The MMMP for piling will be produced in consultation with Natural England, detailing the proposed mitigation measures to reduce the risk of any physical or permanent auditory injury to marine mammals during all piling operations. A draft MMMP (document 8.13) is submitted with the DCO application. An In Principe Monitoring Plan (document 8.12) is provided with the DCO application to outline the proposed monitoring and the basis of delivering the monitoring measures as required by the conditions contained within the Deemed Marine Licences (DMLs). This will developed and discussed with the SNCBs and MMO.
Chapter 12 Marine Mammals	MMO	11th December 2017	The embedded mitigation is detailed in section 12.7.1 of the Marine Mammal chapter and will include a soft start protocol and a mitigation zone. Details of soft start procedure should include the lowest possible operating hammer energy if this is above the 10% of the maximum hammer energy which is the standard soft start level.	The soft-start will be 10% (or less) of the maximum hammer energy.
Chapter 12 Marine Mammals	MMO	11th December 2017	ADDs should be given careful consideration, particularly as they introduce additional acoustic disturbance. However, we note that information will be reviewed and updated with the latest information for all suitable devices that are available when the Marine Mammal Mitigation Plan (MMMP) is prepared post-consent and prior to construction.	A review of all appropriate and suitable mitigation options will be conducted for the MMMP prior to construction.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	MMO	11th December 2017	In general, the MMO will defer to our specialists at Natural England and Cefas however the following points should be addressed.	Acknowledged.
Chapter 12 Marine Mammals	MMO	11th December 2017	An embedded mitigation of soft start piling has been described. The MMO recommends that a soft start piling of 40 minutes be discussed with Natural England as this may not be appropriate in all circumstances. Details of hammer energy and feasibility of achieving the desired 10% of maximum should be discussed when details of the hammer are known.	The minimum potential soft-start and ramp-up period of 30 minutes has been used in the assessment (which is greater than the recommended minimum of 20 minutes). The soft-start will be 10% (or less) of the maximum hammer energy for a minimum of 10 minutes. As a worst-case scenario, the maximum potential soft-start of 20 minutes and ramp-up period of 40 minutes was used in the noise modelling for PTS SELcum.
Chapter 12 Marine Mammals	MMO	11th December 2017	In assessing the risk of collision, it is stated that this will be mitigated against using a vehicle management plan and best practice. The vehicle management plan, in common with other plans mentioned such as Environmental Management plans and a Marine Mammal Mitigation Plan, will need to be captured in the licence however it is unclear how best practice will be secured.	No commitments associated with vessel routing or speeds are proposed as no mitigation is deemed to be required.
Chapter 12 Marine Mammals	MMO	11th December 2017	Page 114 Point 397 of the PEIR suggests that mammals may not move away from all pile noise in 100% of all cases as an illustration that disturbance is less than the worst case. Has this element been factored into the modelling and mitigation for UXO works?	The assessment of the potential impacts of UXO clearance includes the noise modelling for PTS and TTS based on NOAA (NMFS, 2016) and that all marine mammals within a 26km radius could be disturbed. For piling the threshold of possible avoidance based on the Lucke et al. (2009) criteria has been assessed for harbour porpoise and the assessment takes into account that not all harbour porpoise in this potential impact range could be disturbed.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	TWT	8th December 2017	After reviewing the marine mammal sensitivity assessment criteria used across a range of offshore wind farms, we have concerns regarding inconsistencies in approaches. TWT will be reviewing this in more detail in the New Year and will be happy to speak to Vattenfall about any concerns we have regarding assessment methodology used as part of the Environmental Impact Assessment.	It is acknowledged that The Wildlife Trust have raised concerns over the marine mammal sensitivity assessment criteria used across a range of offshore wind farms and inconsistencies in approaches. However, it was agreed on the EPP call (08/12/17) that the proposed approach is currently suitable.
Chapter 12 Marine Mammals	TWT	8th December 2017	Paragraph 205 of the PEIR outlines <i>“During the 60 minutes for the soft-start and ramp-up it is estimated that animals would move over 5.4km from the piling location (based on a precautionary average marine mammal swimming speed of 1.5m/s).”</i> A breakdown of fleeing distance for each ramp up level would be useful to provide certainty that marine mammals would be beyond the zone before each ramp up.	As a precautionary approach the minimum potential soft-start and ramp-up period of 30 minutes has now been used in the assessment for the ES. A breakdown of the distances has been provided in Section 12.7.1.
Chapter 12 Marine Mammals	TWT	8th December 2017	We have reviewed Appendix 12.2 of the PEIR; Acoustic Deterrent Devices (ADDs) as Effective Mitigation for Marine Mammals. However, there is little information on the long terms effects ADDs such as habituation and the additional disturbance effects from their use, especially contributing to temporal impacts. TWT is pleased to see that ADDs are being taken into account as part of the assessment.	All current and relevant information has been reviewed; however, JNCC is currently preparing a report on ADDs which, when available, will be taken into account, along with the latest information and guidance, when preparing the MMMP.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	TWT	8th December 2017	The duration of any potential displacement effects are discussed in 12.7.3.2.5 of the PEIR. We highlight that there is not enough evidence to understand the true nature of harbour porpoise return behaviour following piling activity. Previous studies do highlight differing return times but we have no certainty if these are the same animals returning or new animals visiting the site. We do not know how much site fidelity relates to return times e.g. quicker return times due to good foraging areas (Brandt <i>et al</i> (2016)) which could result in risking overall fitness due to potential multiple flight activity from multiple piling events (Dahne <i>et al</i> (2013)).	The information in section 12.7.3.2.4 has been reviewed to address this.
Chapter 12 Marine Mammals	TWT	8th December 2017	There is also the consideration of other noise producing activities which take place during the construction period that can affect return times. Brandt <i>et al</i> (2016) suggest that “effects lasting beyond the piling time may not only be a result of piling activities, but also of other construction activities resuming after the end of piling, such as demounting noise mitigation systems and the increased shipping activity that goes with it. One factor that points towards this is that detection rates were already decreased for some time before piling.”	The information in section 12.7.3.2.4 has been reviewed to address this.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	TWT	8th December 2017	<p>Heinänen and Skov (2015) report that responses to the number of ships per year indicate markedly lower densities with increasing levels of traffic. A threshold level in terms of impact seems to be approximately 20,000 ships/year (approx. 80/day). Already the shipping levels are quoted in paragraph 519 to be in the <i>“the summer period of the marine traffic survey, there was on average 69 unique vessels per day recorded within NV East, 46 unique vessels per day recorded within the NV West and on average 96 unique vessels per day recorded within the offshore cable corridor. Throughout the winter period of the marine traffic survey, there was on average 63 unique vessels per day recorded within the NV East, 39 unique vessels per day recorded within the NV West and on average 92 unique vessels per day recorded within the offshore cable corridor.”</i> The impact of increased shipping movement should be considered in more detail against this information. This is of particular importance for the cumulative assessment, of which existing vessel movements should be taken into account as part of the assessment.</p>	<p>Reference to the threshold level of impact related to number of vessels (approximately 20,000 ships per year) in Heinänen and Skov (2015) has been used in the assessment in section 12.7.3.4.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	TWT	8th December 2017	<p>Fishing must be included in the cumulative impact assessment. This is based on a precedent set when TWT began Judicial Review proceedings against the Department for Energy and Climate Change in August 2015 against the approval of Dogger Bank Offshore Wind Farm Order due to the exclusion of fishing from the in-combination assessment as part of the HRA. Fishing is a licensable activity and according to the Waddensee case , the regular grant of licenses constitutes a plan or a project. Although our position remained, TWT withdrew the claim due to assurances given by the government regarding the management of fishing within Dogger Bank SAC. One of those assurances was that steps would be put in place to ensure that this scenario would not happen again and that Defra and DECC would work together to ensure fishing would be included in future offshore wind farm impact assessments. Although our challenge was in relation to the lack of inclusion of fishing as part of the HRA assessment, the same principle should apply to the EIA cumulative assessment.</p>	<p>Fishing activity is considered part of the existing baseline, as it has existed in the North Sea for a long time before any OWF construction, it is not a recent or an increasing activity (in most areas fishing is currently in decline). It is more appropriate for fishing to be assessed as part of a more strategic assessment rather than project / developer led assessment.</p>
Chapter 12 Marine Mammals	TWT	8th December 2017	<p>We are in agreement with paragraph 715 that due to uncertainty in project level CIAs, a strategic approach to assessment is required. Different approaches to assessment are taken by offshore developers using different noise criteria and thresholds and different assessment. A strategic approach would ensure consistency, produce more realistic outcomes and provide industry with more certainty on mitigation requirements.</p>	<p>As outlined in section 12.8.3, the level of uncertainty in completing a CIA further supports the need for a more strategic assessment rather than developer led assessment. Norfolk Vanguard Limited is supportive of these strategic initiatives, and will continue to work alongside other developers, Regulators and SNCBs in order to further understand the potential for significant cumulative impacts, and lead to reductions in impacts where appropriate.</p>

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Chapter 12 Marine Mammals	TWT	8th December 2017	A number of different CIA scenarios have been presented in tables 12.80 to 12.83 of the PEIR, with the magnitude impacts ranging from high to low. Following the discussion with the Marine Mammal Expert Topic Group, we agree that, for clarity, the most likely worst-case scenario should be presented.	As agreed the most 'likely scenario' for the potential worst-case for the CIA has been assessed in the ES chapter. The theoretical worst-case and other scenarios have been assessed in Appendix 12.6.
Chapter 12 Marine Mammals	TWT	8th December 2017	Chapter 5 of the PEIR has identified that a number of foundation types are being considered as part of the project design envelope. In order to meet the requirements of the Habitats Directive in terms of FCS of protected sites and the Marine Strategy Framework Directive descriptor 11, TWT believe that there must be a move away from pile driving to reduce noise pollution in the marine environment. To meet Article 6(4) of the Habitats Directive, it is essential that an assessment of alternative foundation types to piling is undertaken to provide justification for the need for pile driving during construction. The alternatives assessment is also a key element of the environmental impact assessment when applying for an EPS licence post-consent.	A number of foundation types are being considered as part of the project design envelope and have been assessed, where relevant, in the ES. The most suitable foundation options for the site would be determined during final design, post consent, and would be informed by further site investigations.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	TWT	8th December 2017	<p>It is important that a site based approach is undertaken to the Southern North Sea cSAC HRA assessment. TWT does not support the Interagency Marine Mammal Working Groups (IAMMWG) proposal on underwater management in its current form. We do not think the evidence which the thresholds are based upon is appropriate and therefore not precautionary enough. TWT, along with WWF, ClientEarth and Whale and Dolphin Conservation have produced a working document describing our collective views of underwater noise assessment and management, which is included in Appendix A and B. The paper advocates the use of noise limits to assess and manage impacts from underwater noise, which would continue to ensure a site based approach. We are currently engaging with Renewables UK to gain an industry perspective on the paper. We would also be happy to discuss the paper with Vattenfall directly.</p>	<p>As agreed, an additional assessment has been included in Appendix 12.4, for information, based on the estimate that the SNS cSAC could support 29,384 harbour porpoise (SCANS-III data for 17.5% of the UK North Sea MU). A separate appendix will also be included with the HRA report. As outlined, in section 12.11.1, the MMMP for piling will be developed in the pre-construction period and based upon best available information and methodologies. The MMMP for piling will be produced in consultation, detailing the proposed mitigation measures to reduce the risk of any physical or permanent auditory injury to marine mammals during all piling operations.</p>
Chapter 12 Marine Mammals	TWT	8th December 2017	<p>Since the designation of Southern North Sea cSAC, more monitoring on the impacts of offshore wind farm on harbour porpoise is required. Monitoring should involve pre-construction, construction and post-construction monitoring of noise levels. In addition to this, a programme of harbour porpoise monitoring is required, again pre-construction, construction and post-construction, to understand harbour porpoise distribution and the impacts of wind farm development upon this. We are happy to discuss this in more detail with Vattenfall.</p>	<p>An In Principle Monitoring Plan (document 8.12) is provided with the DCO application to outline the proposed monitoring and the basis of delivering the monitoring measures as required by the conditions contained within the DMLs. The details of the monitoring methodologies will be developed in consultation with the SNCBs and MMO.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Eastern IFCA	11th December 2017	Sandeels are among the most important prey species for harbour porpoise. Sandeels rely on sandbanks and other sandy substrata similar to those found in the Haisborough, Hammond and Winterton SCI (Ellis et al., 2012). There is a potential pathway for the species to be impacted by the construction and operational work, as well as by the habitat loss associated with unburied, protected cable, however the PEIR has identified these as not significant. This should be further considered to address the cumulative impacts of the project on sandeels with other plans and projects in the Southern North Sea.	Potential impacts on marine mammal prey species, including sandeels, have been assessed in Chapter 11 Fish and Shellfish Ecology using the appropriate realistic worst-case scenarios for these receptors.
Chapter 12 Marine Mammals	Eastern IFCA	11th December 2017	The PEIR concluded that the cumulative underwater noise caused by pile driving during the construction of Norfolk Vanguard, in combination with similar activities occurring at the same time, could potentially impact on harbour porpoise over a wide area. Eastern IFCA asks that further consideration of mitigation measures to protect these species is made prior to the construction of the windfarm. We defer to Natural England for formal conservation advice on this matter.	As outlined, in section 12.11.1, the MMMP for piling will be developed in the pre-construction period and based upon best available information and methodologies. The MMMP for piling will be produced in consultation, detailing the proposed mitigation measures to reduce the risk of any physical or permanent auditory injury to marine mammals during all piling operations. In addition to the MMMP, a Norfolk Vanguard Southern North Sea cSAC Site Integrity Plan will be developed. The Plan will set out the approach to deliver any project mitigation or management measures in relation to harbour porpoise and the SNS cSAC. A draft MMMP for piling (document 8.13) is submitted with the DCO application

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 12 Marine Mammals	Ministry of Infrastructure and Water Management Netherlands	11th December 2017	The impact on the marine mammals due to disturbance is described as the number of animals impacted by one instance of an event. This is then classified according to the criteria mentioned in the PEIR. However the consequences for the population aren't calculated. This makes it difficult to determine the cumulative effects other than qualitatively. As this is the preliminary impact assessment, we hope (and expect) that population consequences will be calculated in the next phase of the environmental impact assessment.	As outlined in section 12.8.3, population models, such as Disturbance Effects of Noise on the Harbour Porpoise Population in the North Sea (DEPONS) and the interim Population Consequences of Disturbance (iPCoD) used at a strategic level would allow consideration of the biological fitness consequences of disturbance from underwater noise, and the conclusions of a quantitative assessment to be put into a population level context. Norfolk Vanguard Limited is supportive of these strategic initiatives, and will continue to work alongside other developers, Regulators and SNCBs in order to further understand the potential for significant cumulative impacts, and lead to reductions in impacts where appropriate.
Chapter 12 Marine Mammals	Ministry for the Environment, France	11th December 2017	It is important to note the negative effects of underwater noise from piling on marine mammals during the building phase. Indeed, other wind farms could be constructed at the same time by creating huge cumulative impacts on these marine mammals.	The cumulative impacts of the construction of other offshore windfarms at the same time as Norfolk Vanguard has been assessed in section 12.8.

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Chapter 12 Marine Mammals	Ministry for the Environment, France	11th December 2017	With a maximal power of 20Mw, some turbines will generate electromagnetic interference far more important than standard turbines with a capacity of 7Mw by contributing to disturb the sense of direction of marine mammals until their beaching along the coast.	Although it is assumed that harbour porpoise and other marine mammals are capable of detecting small differences in magnetic field strength, there is, at present, no evidence to suggest that existing subsea cables have influenced cetacean movements. Harbour porpoise move in and out of the Baltic Sea with several crossings over operating subsea HVDC cables in the Skagerrak and western Baltic Sea without any apparent effect on their migration pattern (Walker, 2001). There is no evidence that pinnipeds respond to electromagnetic fields (Gill et al., 2005). Data from operational windfarms show no evidence of exclusion of harbour porpoise or seals (for example, Diederichs et al., 2008; Lindeboom et al., 2011; Marine Scotland, 2012; McConnell et al., 2012; Russell et al., 2014; Scheidat et al., 2011; Teilmann et al., 2006; Tougaard et al., 2005, 2009a, 2009b).

Feedback related to Offshore Ornithology (Chapter 13 of ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	We note that the 2017 interim advice on assessing displacement of birds from offshore windfarms is not produced by just Natural England and JNCC, but is a joint SNCB note by NRW, DAERA/NIEA, NE, SNH and JNCC. We also suggest that reference is made to Bradbury et al. (2014) with regard to the vulnerability of seabirds to offshore windfarms, as this expands the species covered by Furness et al. (2013) to cover those additional species found in English waters,	Additional information sources noted and the lists updated (section 13.2.1).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>particularly as the Norfolk Vanguard site is in English waters. We also recommended that consideration is given to the updated sensitivities in Wade et al. (2016).</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Table 13.3 highlights four topics for which further discussion is required prior to final submission, which are not included in PEIR:</p> <p>Annual displacement assessment methodology – see summary comment II above regarding displacement assessments and NE’s recommendations for this. These recommendations are in line with the 2017 updated joint SNCB interim displacement advice note, a link to which was sent to Vanguard’s consultants on 22/02/17.</p> <p>Inclusion of uncertainty in collision risk modelling – we note that Masden (2015) is still undergoing testing and we would currently advise that the Band (2012) model is used and that the Applicant presents outputs from the Band model that account for variability in the input parameters – especially densities of birds in flight, flight heights and avoidance rates. We note that Vanguard have presented CRM outputs for the ‘basic’ Band model (Options 1 and 2) for a range of avoidance rates (covering those recommended by the SNCBs $\pm 2SD$ for the species covered by Cook et al. 2014) and for Option 2 for a range of flight heights (including the upper and lower confidence limits</p>	<p>Displacement assessment has been updated in this assessment and NE’s comments on annual displacement taken into account (section 13.7.5.1).</p> <p>Collision modelling has been conducted with the inclusion of the additional aspects of uncertainty detailed by NE (section 13.7.5.3 and Technical Appendix 13.1).</p> <p>Assignment of months to biologically relevant seasons has been conducted on a species-specific basis taking into account the advice of NE (sections 13.7.5.1 and section 13.7.5.3).</p> <p>The assessment has been conducted taking into account NE’s advice on suitable reference populations and consequences (e.g. population modelling).</p> <p>Horswill et al. (2016) present evidence that density dependent population regulation is widespread among seabird populations, with many cases of compensatory density-dependence. Dependatory effects occur less often, and mostly involving increased predation when colony size drops to very low levels. These considerations are included in the population modelling assessments referred to in this ES.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>of the generic flight height data in Johnston et al. 2014). However, the impact assessments have been based on just a single figure from one model option for the recommended avoidance rate and the site-specific (for Option 1) or median flight height (for Option 2) data. Natural England advises that the assessments of collision mortality should use the information on uncertainty and variability in the input parameters (e.g. bird densities, flight heights, avoidance rates) to allow consideration of the range of values predicted impacts may fall within, and to allow an assessment of confidence in the conclusions made regarding adverse effects on site integrity and significance of impacts for populations.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology			<p>Determination of seasons for months which overlap migration and breeding – we would suggest using migration free seasons for all species, as the highest numbers of birds appear to be present in the non-breeding periods and the sites are located outside of foraging range of most colonies. The exception to this is possibly lesser black-backed gull – this still needs further consideration once the full 24 months of data are available for Vanguard West, as there is a need to see if the peak figures in the breeding season are a one off or are repeated in the second year of data covering these months.</p> <p>Population modelling methods (e.g. inclusion of density dependence) – we suggest that Vanguard follow the approach Natural England outlined in the document we produced for Vanguard following the first Offshore Ornithology Expert Topic Group Meeting. Although discussions are ongoing within Natural England regarding this, our position has not changed since we produced the suggested approach for Vanguard. The approach suggested:</p> <p>For EIA scale assessments: there are many uncertainties, particularly in terms of the most suitable population to use, e.g. biogeographic or Biologically Defined Minimum Population Scale (BDMPS). Discussions are still ongoing over the most appropriate population to use, and therefore, we would suggest that the following information analysis is undertaken in the first instance:</p> <ul style="list-style-type: none"> • Calculate the total predicted impact (e.g. 	

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			<p>summed total cumulative collisions) within the defined spatial scale;</p> <ul style="list-style-type: none"> • Estimate of the total number of birds expected to be in the area at the time • Calculate what proportion of this total number of birds come from different colonies and countries using information in Furness (2015) • Then apportion the total impact that would be on birds from the different countries/colonies. • Evaluate the predicted impact against the context of the population the assessment is dealing with. 	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology			<p>Following this, if it is felt that there is a requirement for further population modelling, we would suggest consideration is initially given to existing population models unless there is any additional evidence to suggest the modelling should be undertaken in a different way. If there is not an existing model for a species and population where a requirement for further assessment through population modelling is identified, then we would recommend following the approach outlined for HRA.</p> <p>For HRA: If there is clear evidence of the form and strength of density dependence operating on the focal population (colony) then we would (depending on the evidence provided) consider the outputs from density dependent models. However, it will also be important to consider whether there is any actual evidence that density dependence is acting on the focal population at the present time. We advise trialling a range of forms of density dependence, alongside density independent models and examining the potential range of outcomes using a sensitivity analysis. We advise using a density independent model where there is no information on population regulation for the focal population, but careful consideration should be given to the potential for compensatory population regulation. Consideration could also be given to the evidence for compensatory and compensatory regulation presented in Horswill et al. (2016).</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 32 notes that the offshore cable corridor is included within the study area. We assume that the offshore cable corridor area goes to Mean Low Water Springs (MLWS) at the landfall location and that the assessment of impacts above MLWS is included in the onshore ornithology chapter.	This is correct.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	We note that the PEIR is based on 32 months of survey data for NV East and 18 months for NV West. We note from this paragraph that 24 months of survey data from NV West will be available for the Environmental Statement (ES) and we advise that this is included in the ES.	The assessment presented in the PEIR has been updated to include the extra survey data for Norfolk Vanguard West (for which the assessment is now based on 24 months).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 36 notes that no surveys have been conducted along the offshore cable corridor and therefore the data sources listed in paragraph 35 have been used to inform the baseline characterisation and impact assessment for cable installation. We note that from paragraph 35 red-throated diver densities in the Outer Thames Estuary SPA (JNCC 2013) and data from an unpublished report on surveys carried out in 2013 by APEM for Natural England have been examined. However, the offshore cable corridor passes through the Greater Wash SPA, so we would suggest that data used in the Departmental Brief for the Greater Wash SPA are also considered as a data source for characterising the offshore cable corridor.	The additional data sources have been consulted for the current assessment (section 13.5.2.1).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	We note that Figure 13.2 of SPAs assessed in relation to Norfolk Vanguard does not include the Greater Wash SPA – this is relevant to the	Consideration has been given to this SPA in the current assessment (section 13.7.4.1

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			assessment as the offshore cable corridor passes through this site.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 46 states that: 'Those sites that have been identified are listed in Table 13.9 and detailed in Appendix 10.4 HRA Screening, of Chapter 10 Benthic and Intertidal Ecology.' We are uncertain why the overall HRA Screening is included as an appendix to the Benthic and Intertidal Ecology chapter, as it covers more aspects than just benthic ecology (e.g. offshore ornithology, marine mammals).	This reference was included in error and has been corrected in the current assessment.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Table 13.9 of designated sites and their ornithological features: Column listing the distance of the sites to the project (km) – is this minimum distance to the offshore wind farm footprint? If so, consideration should be given to also including the distance of the sites to the offshore export cable – will be most relevant for the Greater Wash SPA as the offshore cable corridor passes through this site. We assume this table only lists ornithological features of the sites that may have connectivity with the Vanguard site, as the breeding tern qualifying features of several of the SPAs (e.g. Hamford Water, Chichester & Langstone Harbours and Solent & Southampton Water SPAs) aren't mentioned – only the passage/wintering waterbird features are. If this is the case, the table heading needs to be amended to make this clear. The Outer Thames Estuary is listed in this table, but we note consideration should also be given to the Outer Thames Estuary pSPA, where the	The headings and information provided in this table have been updated to reflect these comments (section 13.6.1).

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			proposal is for the extension of the boundary for foraging areas of breeding terns and for the addition of breeding common and little tern as qualifying features.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	The BoCC listings included in this table appear to be out of date for some species – kittiwake and puffin are now red listed and red-throated diver is now green listed on BoCC 4 (2015)	The status of all species in this table have been reviewed against the latest BoCC report and amended accordingly (section 13.6.2.1).

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Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p><i>'For the breeding period, the potential for connectivity to known breeding populations has been considered. However, it should be noted that bird abundance was low for all species during the breeding season, with many species absent in one or more of the summer months. This indicated that very few breeding birds utilise the Norfolk Vanguard OWF sites. The seasonal definitions in Furness (2015) include overlapping months in some instances due to variation in the timing of migration for birds which breed at different latitudes (i.e. individuals from breeding sites in the north of the species' range may still be on spring migration when individuals farther south have already commenced breeding). Due to the very low presence of breeding birds it was considered appropriate to define breeding as the migration-free breeding period, sometimes also referred to as the core breeding period.'</i></p> <p>This generally seems ok for Norfolk Vanguard based on the data presented in the PEIR given the low numbers of birds in the breeding season and that the Vanguard site is located outside of foraging range for all species, with the exception of lesser black-backed gull (LBBG) and gannet. We suggest this may need to be revisited (particularly with regard to LBBG) once the remaining 6 months of data from Vanguard West are included, so that there is a second breeding season of data included and we can see whether the LBBG numbers in particular are a one off or may occur more regularly.</p>	We have reviewed the assignment of months to biological seasons and this is reflected in section 13.6.2.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 52 notes that the abundances presented in Table 13.13 do not include birds observed in the 4km buffer around the site boundaries. We would suggest that an additional column is included in Table 13.3 to also present estimates for the site + buffer (either just the site + 4km buffer or the site + 2km buffer as well).	This would require an additional 12 columns (to cover the seasonal and site breakdown provided in this table). Data for the buffer zones are already presented in the technical appendices. Therefore, in order to minimise the complexity of the assessment and repetition of data these have not been reproduced here.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 57 states: 'Aerial surveys of the pSPA have recorded moderate numbers of red-throated divers in the vicinity of the cable corridor with densities of around one or two birds per km2.' As no site-specific data were collected for the offshore cable corridor, the evidence source of this figure should be included.	The source for this has been added.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Skuas - 13.6.2.1.6 & 13.6.2.1.7; Terns - Section 13.6.2.1.11; Little gull - Section 13.6.2.1.13: These sections only consider the numbers recorded in the aerial surveys. Given these species are passing through the site on migration, turnover/flux of these species needs to be taken into account due to the snapshot nature of the aerial surveys. We would suggest that some information is included here on the work done for the CRM assessments for skuas and terns to account for this following the method in WWT & MacArthur Green (2014). We would also suggest that a similar approach is undertaken for little gull and information from this included in the little gull baseline characterisation section.	These sections provide a summary of the survey observations. The suggested amendments are relevant to the collision assessment (section 13.7.5.3) and have been taken into account in other sections as appropriate.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>13.6.2.1.1.4 It may be worth noting the higher numbers recorded in the Vanguard West 4km buffer in June and July in this section and whether there are any reasons for why higher numbers should be present in the buffer than the site. Although, we also note that a further 6 months of data (March – August 17) are yet to be included in the analysis, so it is possible that these higher numbers were a one off in June and July 2016.</p>	<p>We are not aware of any reason for these observations in 2016 but note that much lower numbers were recorded in the same months in 2017 and hence the average estimates are reduced.</p>
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>13.6.2.2 This section notes that migration modelling was conducted at EA3 for 23 non-seabird migrant species using the approach described in the SOSS 05 Project and that collisions were estimated using the Band collision risk model Option 1. It concludes that as the results from the EA3 modelling indicated that none of the species was at risk of significant collisions whilst on migration and non-seabird migrants were screened out of further assessment for EA3, the same conclusions apply to Norfolk Vanguard and no further assessment of potential impacts on non-seabird migrants has been undertaken.</p> <p>We do not consider that it is appropriate to just say that it wasn't an issue at EA3, so it won't be here. Consideration should be given to whether there are any relevant SPAs that may be in the shadow of the Vanguard sites (e.g. at EA One there were concerns over dark-bellied brent geese migrating through the site to the Deben Estuary) – there may be a need to consider sites such as the North Norfolk Coast/Breydon Water.</p>	<p>Further discussion on this aspect has been provided in section 13.7.5.3.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Table 13.14 states: 'The Norfolk Vanguard site was identified through the Zonal Appraisal and Planning process and avoids European protected sites for birds (e.g. Flamborough and Filey Coast pSPA is more than 210km from the OWF sites and Alde-Ore Estuary SPA is over 100km from the OWF sites). This means the site is beyond the foraging range of almost all seabird species, the exception being gannet for which a mean maximum range of up to 229km has been estimated (Thaxter et al., 2012).' We note that the mean-maximum foraging range of lesser black-backed gull (a qualifying feature of the Alde-Ore Estuary SPA) in Thaxter et al. (2012) is 141km and as Table 13.9 lists the Vanguard site as being a minimum distance of 92km from the Alde-Ore, the site is within foraging range of this species as well as for gannet.	The assessment has been updated to reflect these considerations.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 96 states: ‘The maximum area of each site (NV East and NV West) in which turbines would be located relates to the total capacity of 1800MW. Thus, the only scenario for which 100% of either site would be completely developed is scenario 1 in which all of NV West would be treated as developed (e.g. in terms of its potential for causing displacement). This means, for example, that under scenario 1 there could be complete displacement from NV West and none from NV East. Under scenario 2 there would be potential for a maximum of 75% displacement from NV West (1200/1800) and 25% from NV East (600/1800). It should be noted that the maximum build out of NV east would therefore only cover 75% of the wind farm site.’</p> <p>We note our summary point III above regarding concerns over the appropriateness of the assumption that there would only be a proportion of displacement based on the proportion of capacity built in each site.</p> <p>However, we note that it is useful to see the worst case scenario in terms of capacity layout for each species, but it would also be useful to see what the worst case layout is in terms of impact on total number of birds – as it would then be possible to see which layout scenario would impact the greatest overall number of birds, but which option is having the greatest impact on an individual species.</p> <p>We also note that the proportions of capacity quoted in paragraph 59 for scenario 2 (75% of capacity in Vanguard West and 25% in Vanguard</p>	This section of the assessment (13.7.5.1) has been updated to reflect revisions to the design options for NV West and NV East and also to ensure that the worst case scenario is assessed.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>East is different to that presented in the operational displacement impact assessment section (see Section 13.7.4.11, paragraph 187 and Table 13.22), which lists scenario 2 as being 67% of capacity in Vanguard West and 33% in Vanguard East. We assume the figures in the operational displacement impact assessment are the correct ones, as paragraph 59 states 1200/1800MW in Vanguard West, which is 67% of the total 1800MW capacity and not 75%.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 106 notes that black-throated diver and great northern diver were screened out of assessment (as black-throated divers were recorded on only one survey and great northern diver were recorded in only two surveys). We would suggest that this is checked as the data presented in the tables in Annex 1 of Appendix 13.1 suggest that black-throated divers were recorded in March and April (i.e. two surveys) and</p>	The relevant sections have been corrected.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			that great northern divers were recorded in March, April and December (i.e. three surveys).	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>We would suggest that common scoter should also be considered in the screening for construction disturbance and displacement as it is a qualifying feature of the Greater Wash SPA and is a species that is sensitive to disturbance/displacement from vessel activity etc. and the cable corridor passes through the Greater Wash SPA. Although we note that this species wasn't recorded in the offshore wind farm sites, but it was (albeit low numbers) within the 4km buffer. Additionally, no site-specific survey data have been collected for the offshore cable corridor and therefore, we would suggest that the data used in the Departmental Brief for the Greater Wash site are used to help inform the baseline characterisation for the offshore cable corridor. It may be that the cable corridor doesn't pass through the main areas of the Greater Wash SPA used by common scoter, but this should be looked at and discussed. We would suggest that this also applies for the tern qualifying features of the Greater Wash SPA as well – as Natural England does consider tern species to be sensitive to visual disturbance from cable laying in our conservation advice on operations (e.g. see for North Norfolk Coast for Sandwich and little terns) We would suggest that the distributions of the</p>	<p>Further consideration to the potential for all qualifying features of the Greater Wash SPA to be affected by construction disturbance has been provided in section 13.7.4.1.</p> <p>Further consideration of the potential for red-throated diver to be affected by construction of the wind farm has been provided in section 13.7.4.1.</p> <p>Species sensitivity scores have been reviewed and amended as considered appropriate, with further justification as necessary (sections 13.7.4.1, 13.7.5.1).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>relevant species shown in the Departmental Brief are examined to see if there is any possible overlap with the foraging areas with the cable corridor.</p> <p>We query why red-throated diver have been screened in for the offshore cable corridor only and would suggest that they should also be screened in for the wind farm site(s) as well.</p> <p>As guillemot and razorbill both score a 3 for both disturbance susceptibility and habitat specialisation in Bradbury et al. (2014), we recommend that these species should be classed as medium sensitivity to disturbance and displacement rather than low to medium.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>We note our summary point II above regarding the need to sum impacts across individual seasons to give an overall annual impact for each species for all build out scenarios. This will be particularly important for the assessment of Vanguard East and Vanguard West impacts combined.</p> <p>As we recommend that guillemot and razorbill are classed as medium sensitivity to disturbance and displacement rather than low to medium, we therefore advise that the impact significance for the assessment for these species is considered to be minor adverse.</p>	Impacts have been reviewed and amended as appropriate (section 13.7.5.1).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 167 states: ‘...the worst case option during the non-breeding season (scenario 3) would result in 221 individual guillemots being at risk of displacement.’ However, paragraph 168 states: ‘...Displacement of up to 110 birds will have a negligible influence on the population density across the BDMPs region...’ We suggest</p>	The displacement assessment has been reviewed and amended as necessary.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			that the discrepancy between the figures quoted in these paragraphs is checked.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Table 13.20 – Operational disturbance and displacement screening: For lesser black-backed gull the biological season/s with peak numbers is listed as n/a – clarification of what this means is required – does it mean that no season had a clear peak? As noted previously, we would suggest that guillemot and razorbill are considered to have a medium sensitivity to disturbance and displacement rather than a low to medium sensitivity, given their scores for both disturbance susceptibility and habitat specialisation in Bradbury et al. (2014) and the 68% displacement rate for OWEZ shown in this table.</p>	<p>This was intended to indicate that the species abundance does not indicate a seasonal peak. This has been clarified. Species sensitivity scores have been reviewed and amended as considered appropriate, with further justification as necessary (section 13.7.5.1).</p>
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Project scenarios (Section 13.7.4.1.1) We note our summary point III above regarding concerns over the appropriateness of the assumption that there would only be a proportion of displacement based on the proportion of capacity built in each site.</p>	<p>The worst case scenarios have been reviewed and updated with regard to these comments and to ensure the assessment is robust (section 13.7.5.1).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Displacement matrix tables have been presented for each relevant season individually and displacement is presented from 0 – 100% at 10% increments and mortality is presented from 0 – 100% at 1% increments up to 10% and larger gaps thereafter. However, the range of scenarios considered in the assessment are 60-80% displacement and 5-10% mortality. Natural England recommend that a worst case scenario of 100% displacement and 10% mortality is considered for red-throated divers – the 2017 SNCB joint interim displacement note suggests that for species such as divers a displacement level of 90-100% is likely to be recommended. We note our summary point IV above regarding the need to present data and predicted impacts in a way that allows the full range of uncertainty (e.g. around input data, analysis, methodology) to be understood and evaluated.</p> <p>We note our summary point II above regarding the need to sum impacts across individual seasons to give an overall annual impact for each species for all build out scenarios.</p> <p>We note our summary point III above regarding concerns over the appropriateness of the assumption that there would only be a proportion of displacement based on the proportion of capacity built in each site.</p>	The displacement assessment has been reviewed and updated where necessary (section 13.7.5.1).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Displacement matrix tables 13.26-13.28 for Vanguard West – we suggest that the figures that have gone into these tables for 100% displacement and 100% mortality and hence the overall matrix figures are checked. As from the data presented in Table 26.1 of Annex 1 of Appendix 13.1 these figures appear to be too low:</p> <ul style="list-style-type: none"> - In Table 13.26 (autumn) the figure given for 100% displacement and 100% mortality is 17, but Table 26.1 of Annex 1 of Appendix 13.1 suggests this figure should be 30 (29.76) for Vanguard West + 4km buffer (100% capacity). - In Table 13.27 (winter) the figure given for 100% displacement and 100% mortality is 24, but Table 26.1 of Annex 1 of Appendix 13.1 suggests this figure should be 354 (353.92) for Vanguard West + 4km buffer (100% capacity). - In Table 13.28 (spring) the figure given for 100% displacement and 100% mortality is 5, but Table 26.1 of Annex 1 of Appendix 13.1 suggests this figure should be 302 (302.22) for Vanguard West + 4km buffer (100% capacity). <p>If this is the case then the whole matrix tables and impact assessment need to be updated. We also note that these figures may change once the remaining 6 months of data (March-August 2017) have been included for the Vanguard West site.</p>	The assessment has been reviewed and updated and also now incorporates additional survey data for NV West which was not available for the PEIR.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Table 13.29 presents the red-throated diver combined Vanguard East and Vanguard West operational disturbance and displacement impacts for the various build out scenarios for each relevant season and highlights the worst case for each season. It would also be useful if	The worst case scenarios have been revised and hence the assessments have also been revised (section 13.7.5.1).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			matrices can be provided (in an annex) for each scenario.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 213 states: ‘The displacement matrices have been populated with data for gannets during the autumn and spring migration periods within the site and those calculated within a 2km buffer, in line with guidance (Joint SNCB Note 2017).’ The breeding season has not been included in the assessment, which should be done, as even though peak numbers of gannets occur in the Vanguard site outside of the breeding season, the data presented in Annex 1 of Appendix 13.1 show that gannets were recorded in lower numbers in all months in the breeding season. Inclusion of the breeding season will allow a complete annual prediction to be made.</p> <p>We note our summary point III above regarding concerns over the appropriateness of the assumption that there would only be a proportion of displacement based on the proportion of capacity built in each site.</p>	The assessment has been revised to accommodate consideration of impacts throughout the year (section 13.7.5.1).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>We welcome that the spring and autumn migration period (i.e. non-breeding season) displacement assessments have been summed (paragraphs 219-220; 224-225; 230-231). However, breeding season impacts should also be added to this to give an annual predicted impact, which is then assessed against the baseline mortality of the largest BDMPS and biogeographic population.</p>	The assessment has been revised to accommodate consideration of impacts throughout the year (section 13.7.5.1).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Table 13.34 presents the gannet combined Vanguard East and Vanguard West operational disturbance and displacement impacts for the various build out scenarios for each relevant season and the non-breeding season combined and highlights the worst case for each season. It would also be useful if matrices can be provided (in an annex) for each scenario.	The worst case scenarios have been revised and hence the assessments have also been revised (section 13.7.5.1).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Auks – Puffin, Razorbill, Guillemot</p> <p>We welcome that the assessments include figures for predicted displacement across a range of displacement and mortality scenarios, and that the predictions for each relevant season, including the breeding season, are then summed to give an annual predicted total that have been assessed against the baseline mortality for the largest BDMPS and the biogeographic population.</p> <p>However, we note:</p> <p>The concerns we have raised in our summary point III above regarding concerns over the appropriateness of the assumption that there would only be a proportion of displacement based on the proportion of capacity built in each site.</p> <p>Our summary point IV above regarding the need to present data and predicted impacts in a way that allows the full range of uncertainty (e.g. around input data, analysis, methodology) to be understood and evaluated.</p> <p>The recommendation that the sensitivity of guillemot and razorbill to displacement should be considered to be medium rather than low to medium.</p> <p>Tables 13.48 and 13.55 present the razorbill and</p>	The worst case scenarios have been revised and hence the assessments have also been revised (section 13.7.5.1).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>guillemot combined Vanguard East and Vanguard West operational disturbance and displacement impacts for the various build out scenarios for each relevant season and the annual impacts combined and highlights the worst case for each season. It would be useful if matrices can be provided (in an annex) for each scenario.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>We welcome that collision risk modelling (CRM) outputs have been presented for Band (2012) Options 1 and 2. Paragraph 311 notes that Option 2 uses the percentage of birds flying at PCH derived from data presented in Johnston et al. (2014). As noted at EA3, Natural England considers it inappropriate to use the Johnston et al. (2014) generic flight height curves for boat-based data with site-specific densities from aerial surveys in CRM assessments using the Band model. We therefore advise that the focus,</p>	<p>We note this comment. However, following subsequent advice provided by the aerial survey contractor (see section 13.7.5.3 and Technical Appendix 13.1) we are unable to base the collision assessment on option 1 (site-based flight heights) and hence the assessment uses the results of option 2 modelling. Both sets of results (options 1 and 2) are presented in the technical appendix .</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			wherever possible should be on the CRM Band Option 1 outputs.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 313 notes the work undertaken by APEM Ltd. looking at gannet avoidance rates at Greater Gabbard. We acknowledge the findings in APEM (2014) that use of the 98.9% avoidance rate for the basic Band model may overestimate collision predictions. At present our advice regarding gannet avoidance is as per the joint Statutory Nature Conservation Bodies response to the Marine Scotland review of avoidance rates report by Cook et al. (2014), i.e. 98.9% avoidance rate for gannet with the basic Band model. As this study is based on just 8 gannets entering the offshore wind farm, there is not enough evidence to robustly determine the avoidance rate. However, we welcome future monitoring along the lines of the APEM (2014) study to determine an appropriate avoidance rate for gannet.</p>	No update required.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 316 notes the work previously undertaken for EA3 on nocturnal flight activities. We note that the work previously undertaken for EA3 (EATL 2015) presented a reasonable amount of evidence of nocturnal flight activity of gannet and kittiwake, but much less was presented for lesser black-backed gulls and none for herring gulls or great black-backed gulls. Therefore, Natural England does not consider there to be sufficient evidence to accept changing the nocturnal factor used for large gulls. However, there may be sufficient evidence for stating that the nocturnal activity assumed for gannet and kittiwake in the CRM can be considered a precautionary approach. But we do note that following the second Offshore Ornithology Expert Topic Group meeting, MacArthur Green are going away to consider this further.	<p>We understand that Natural England have provided advice to Norfolk Boreas OWF to present collision modelling with existing nocturnal activity levels and reduced ones (by 25%) for all the species named here.</p> <p>A review of tag-based studies has identified revised nocturnal flight activity estimates for gannet (Furness subm.). Collision modelling for this species has used these revised figures. Although a similar review will shortly be available for kittiwake, no work has been conducted to date for the larger gull species. Thus, these gull species have been modelled in line with the Natural England advice noted above (existing nocturnal level and reduced level).</p>
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 318 identifies great skua, Arctic skua, Arctic tern and common tern as potential migrants through the Vanguard site where collision risks have been estimated using Options 1 and 2 and also following the methods described in WWT & MacArthur Green (2014). We welcome that this approach has been undertaken for these species and suggest that little gull is also a species assessed using this approach.	No action required.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 322 states: ‘The default avoidance rate was 99%, the exceptions to which were for gannet and kittiwake (98.9%) and large gulls (99.5%)’: We note that the default avoidance rate for species not covered by Cook et al. (2014) and the joint SNCB response to this work should be 98% and not 99%. The joint SNCB response to Cook et al. (2014) states that for other seabirds (e.g. skuas) and waterbirds (e.g. divers, seaducks, etc.) Cook et al. (2014) does not conduct an analysis or provide recommended avoidance rates for any version of the Band model. In light of this, the SNCBs continue to recommend the basic Band model, in conjunction with a default 98% avoidance rate, for predicting collisions of species other than those detailed here, until such time as further species-specific work has been undertaken.</p>	The default avoidance rate for species not specifically identified in Cook et al. (2014) has been revised to 98%.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 323 states: ‘Only gannet and kittiwake had sufficient flight height observations (i.e. >100) to permit robust site-based height estimates across the three survey datasets (for the former East Anglia FOUR, NV East and NV West). For these two species collision estimates assessed use Band option 1. For all other species Band Option 2 is used’: We assume that this is considering just the data from the Vanguard East and West sites and does not include the 4km buffers – as the data presented in Table 10 of Annex 3 of Appendix 13.1 shows that the old EA4 dataset had over 100 records of fulmar and great black-backed gull as well as gannet and kittiwake for the site + 4km</p>	We note this comment however, as noted above, we are unable to base the collision assessment on option 1 (site-based flight heights) and hence the assessment uses the results of option 2 modelling. Both sets of results (options 1 and 2) are presented in the technical appendix.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>buffer. We would suggest that the data from the Vanguard East and West sites + 4km buffers are used for establishing sufficient flight height observations in order to maximise the data set, unless there is reason to believe that flight heights in the buffers are significantly different to the sites. This should be revisited once all the data from Vanguard West are available.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Tables 13.56 and 13.57 – seasonal and annual collision estimates for each project scenario for 7MW and 15MW turbines. It is unclear for which avoidance rate the collision figures presented in these tables refer to – we assume they are for the recommended avoidance rates for the Basic Band model, i.e. 98.9% for gannet and kittiwake, 99.5% for lesser black-backed gull, herring gull, great black-backed gull and 98% for fulmar, skuas, little gull, common gull. This needs to be made clear.</p>	Clarification has been provided.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Seabird collision mortality estimates. We welcome that collision mortality predictions have been presented for gannet, kittiwake, lesser black-backed gull, herring gull and great black-backed gull for Band Options 1 and 2 for a range of avoidance rates, which include the SNCB recommended rates for these species for the ‘basic’ Band model as well as the recommended +/- 2SD of these rates. We also welcome that for</p>	Additional collision modelling, taking into account uncertainty in a range of parameters has been conducted and is presented in full in the technical appendix and is summarised in section 13.7.5.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>Option 2 outputs have also been provided for the %PCH for the maximum likelihood and upper and lower 95% confidence limits of the generic flight height data. This takes account of the uncertainty in avoidance rates and flight heights. We also note that uncertainty in the bird densities could also be incorporated by providing collision predictions using the upper and lower confidence limits of the density data.</p>	
<p>Chapter 13 Offshore Ornithology</p>	<p>Natural England</p>	<p>11th December 2017</p>	<p>Paragraph 330 suggests that the Vanguard site is within mean maximum foraging range of lesser black-backed gull only. We note that Table 13.9 suggests that the Vanguard site is a minimum of 205km from the Flamborough and Filey Coast pSPA and hence the site is within the mean-maximum foraging range of 229.4km of gannet in Thaxter et al. (2012).</p>	<p>The text has been updated to acknowledge this fact.</p>
<p>Chapter 13 Offshore Ornithology</p>	<p>Natural England</p>	<p>11th December 2017</p>	<p>Paragraph 331 notes that the BTO have undertaken several years of GPS tracking of breeding lesser black-backed gull from the Alde-Ore Estuary SPA colony (Thaxter et al. 2015) and that the results of this show there was virtually no overlap between the foraging areas and the wind farms. We suggest that a figure(s) is included to illustrate the evidence to support this statement. Paragraph 331 also notes that based on the tracking work it is therefore likely that very few of the lesser black-backed gulls recorded during the breeding season on the Norfolk Vanguard sites are breeding adults from this colony: If these birds are not from the Alde-Ore, then which colonies are these birds coming from? We note that even though the tracking studies of</p>	<p>A figure has been copied from the source publication as suggested and included in Technical Appendix 13.1. The survey data have been analysed in relation to Natural England's suggestion of looking at age distributions of lesser black-backed gulls. Details of this analysis are presented in Technical Appendix 13,1 Annex 8, and this has been used to inform the relevant sections of the assessment.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>birds from the Alde-Ore found that few tracks approached the Vanguard OWF area, these studies only track a small proportion of the birds from the site, so it cannot be ruled out that they are linked to the Alde-Ore. If the birds recorded on the site are non-breeders and/or immatures, then we would assume that a proportion of these are linked to the Alde-Ore SPA. Are there any age data available from the aerial surveys for the lesser black-backed gulls identified on the Vanguard sites during the breeding season?</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 332 uses the non-breeding season Biologically Defined Minimum Population Scales (BDMPS) proportion of immature birds to calculate breeding season populations, for all species assessed for CRM. We note the comments we have raised in our summary point V above regarding this. This is particularly relevant for lesser black-backed gull and we would suggest that the breeding season BDMPS used here is calculated based on all colonies within foraging range of the Vanguard site.</p>	The assessment has been revised to address these points.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Table 13.60 - Percentage increase in the background mortality of seasonal and annual populations due to predicted collisions due to the worst case 7MW turbine and species specific worst case development scenario: - It needs to be clear from this table which Band</p>	The assessment has been revised to address these points and also to accommodate other revisions since the PEIR analysis was conducted (section 13.7.5.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>model option (1 or 2) outputs have been used to calculate these figures. We assume it is Option 1 for gannet and kittiwake and Option 2 for the large gulls. We also assume that the CRM outputs presented are for the recommended avoidance rates (i.e. 98.9% for gannet and kittiwake and 99.5% for the large gulls) and the median generic flight heights (where Option 2 is presented). We would suggest that figures are presented for the range of avoidance rates and generic flight height data, so that the conclusions can be based on a range of figures.</p> <p>- The reference populations used here are the biogeographic populations. We would suggest that the assessment is done against the baseline mortalities of both the largest BDMPS and the biogeographic population, as has been done for the operational displacement for auks as this will give a range for the impact.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 203 makes conclusions on the magnitude and significance of impact from collision risk, but no reference is made to the sensitivity of each species to collision risk – this should be included somewhere in the assessment.	The assessment has been updated to address this point (section 13.7.5.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Additive impacts: Natural England considers the two impacts of collision and displacement as additive and advises that they should be summed – this is of particular relevance for gannet. We acknowledge that in summing the predicted mortalities that may arise via these two mechanisms, there is a risk of double counting. Thus, it is acknowledged that this simplistic approach will therefore incorporate a degree of precaution. However, the extent of that is hard to gauge given that the predictions of the number of fatalities due to collisions depends critically upon application of an assumed overall avoidance rate (i.e. an assumed percentage of individuals which alter their flight behaviour to avoid collisions) which in some cases can be considered to incorporate some degree of macro-avoidance of entire wind farms and might otherwise be classed as barrier impacts. The SNCBs are seeking further evidence from ongoing and proposed studies into avoidance rates that will help clarify the relationship between collision risk, displacement and so called ‘macro’ avoidance.</p>	<p>We do not consider it appropriate to combine these mutually exclusive sources of potential impact for gannet at this location. This is due to the fact that almost all records of this species occur outside the breeding season when the consequences of displacement from the wind farm for this species, which undertakes migration to west African waters, will be negligible, since the scale of movements makes it clear the species is not reliant for resources on any given location in the southern North Sea.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Table 13.61 – Key parameters for predicting collision risk for migrant seabirds:</p> <ul style="list-style-type: none"> - The figures for the percentage of birds at rotor height presented in the table are referenced as being from Johnston et al. (2014) – however, these figures look to be the ones in Cook et al. (2012) and not Johnston et al. (2014) – the figures from the corrigendum to Johnston et al. (2014) are: Arctic skua – 2.6%, great skua – 5.9%, Arctic tern – 4%, common tern 7.4%, so we would suggest that these are updated. We note that the figures presented in Johnston et al. (2014) are for a 20-120m turbine, therefore, we suggest that the flight height data from Johnston et al. (2014) are used to calculate the %PCH for each species for the Vanguard worst case scenario turbine specifications. It also appears that currently the %PCH figures presented in Table 13.61 for Arctic and great skuas are the wrong way round. - We suggest that the migration corridor of 0-10km presented for Arctic tern is checked, as WWT & MacArthur Green (2014) lists this as 0-20km. 	<p>The Johnston et al. (2014) data have been used for the options 2 collision assessment. Migration corridors have been reviewed and amended as necessary (Section 13.7.5.3).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 341 states: ‘NV West and NV East are located 47km and 70km from the coast at their nearest points. These are farther offshore than any of the corridor widths for the migrant seabird species in Table 13.61. While a few individuals may travel beyond the outer edges of these corridors, given the low percentages at collision height the overall collision risk will be very small. Consequently, any effects from Norfolk Vanguard will be negligible and cause no material difference to current baseline mortality rates. The magnitude of effects is considered to be negligible for all species. Therefore, no impacts would be expected to result from collisions for any of these migrant seabird species’:</p> <p>With regard to the migrant seabirds considered so far, while we cannot say with certainty that there will be no impact, we do agree that given the distance Norfolk Vanguard is offshore, any impacts will be negligible. We advise that little gull is also considered here, although note that WWT & MacArthur Green (2013) gives a likely migration corridor of 0-20km for this species that it is likely that the same conclusion will apply as for skuas and terns already considered.</p> <p>Migrant non-seabirds: As noted above, we do not consider that it is appropriate to just say that it wasn’t an issue at EA3, so it won’t be here. Consideration should be given to whether there are any relevant SPAs that may be in the shadow of the Vanguard offshore wind farm (e.g. at EA One there were concerns</p>	<p>The migrant seabird assessment has been updated as suggested (section 13.7.5.3).</p> <p>The migrant nonseabird assessment has been considered in further detail and additional assessment included as necessary (section 13.7.5.3).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>over dark-bellied brent geese migrating through the site to the Deben Estuary). There may be need to consider sites such as the North Norfolk Coast/Breydon Water. As a minimum we would suggest that the CRM is re-done using the densities produced at EA3 (if they are appropriate after consideration of any SPAs that may be in the shadow of the site) and the Vanguard turbine specifications, site details etc.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>We agree that any effects of decommissioning are likely to be similar to those generated during the construction phase. However, we note that further consultation regarding decommissioning activities will be required with SNCBs to allow any best practice to be incorporated to minimise potential impacts.</p>	Noted.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Table 13.62 – Potential cumulative impacts: Both points on construction impacts should make reference to any potential overlap, particularly temporally, with construction of EA3, unless there is absolutely no chance of construction timings of these two sites overlapping. Consideration should perhaps also be given to any potential for cumulative operation of EA3 overlapping with construction of Norfolk Vanguard.</p>	Consideration of these points has been made in the revised assessment (section 13.8.2).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Cumulative effects are considered for kittiwake, common gull, lesser black-backed gull, herring gull, great black-backed gull and red-throated</p>	Consideration has been given to the inclusion of these species in the cumulative assessment.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			diver. We suggest that effects on little gull, common scoter and terns are also considered.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Table 13.63 – Summary of projects considered for CIA:</p> <p>It would be useful if the tier each windfarm is considered to be in was included in this table. We note that EA3 has now been consented. We note that the PEIR for Hornsea 3 has been completed and is available at: http://www.dongenergy.co.uk/en/Pages/PEIR-Documents.aspx</p> <p>However, we note that this document is based on only 11 months of baseline data and so the figures presented are likely to change. However, they could be used here to give an indication of likely impacts from this project.</p>	The cumulative assessment has been updated to reflect the currently available data (section 13.8.2.3).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 370 suggests that the species assessed for project alone operational displacement impacts (and the relevant seasons) included black-throated diver and great northern diver. We suggest that this is checked as these species were screened out of the operational displacement for the site alone based on the very few surveys on which these species were recorded. Paragraph 371 talks about the windfarms included within the BDMPS for the cumulative impact assessment for red-throated, black-throated and great northern divers, which suggest that all three diver species have been included in the cumulative assessment. However, we note that Section 13.8.2.5 (cumulative assessment of operation</p>	These sections (13.8.2.4) have been revised accordingly.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			displacement risk) does not include any assessments for black-throated and great northern divers.	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 372 states: 'The species assessed for project alone collision impacts (and the relevant seasons) were those for which collision mortality greater than 30 individuals was estimated.' We note that this list of species will need to be revisited once the remaining 6 months of data are included for Vanguard West and the CRM has been revised. We also note that a figure of predicted mortality of greater than 10 individuals was used as the cut off figure at EA3 for including species in CRM impact assessments for the project alone – we would recommend that this is again used here rather than the higher figure of 30.	We have updated the collision modelling with additional data and for the use of option 2 throughout. Following this any further revision in light of this comment has also been included (section 13.8.2.5).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 373 states: 'BDMPS populations have not been defined for common gull and little gull, therefore these species have been assessed in relation to their biogeographic populations with connectivity to the North Sea.' This suggests that common and little gull have been included in the cumulative CRM assessments, but these species have not been included in the assessments in Section 13.8.2.6 (cumulative assessment of collision risk).	These sections (13.8.2.5) have been amended.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Cumulative Assessment of Operation Displacement Risk</p> <p>For all species assessments we note our summary comment I above regarding there being a remaining 6 months of data to be included for the ES for Vanguard West. We also note the concerns we have raised in our summary point III above regarding the appropriateness of the assumption that there would only be a proportion of displacement based on the proportion of capacity built in each of Vanguard East and West.</p> <p>The assessments for all species are based on taking the cumulative figures presented for EA3 and adding the Norfolk Vanguard predictions to these totals. Therefore, the cumulative figures presented do not include figures for Hornsea 3 – whilst figures may not have been available at the time of drafting this PEIR, the Hornsea 3 PEIR has been submitted at Section 42 and is available at: http://www.dongenergy.co.uk/en/Pages/PEIR-Documents.aspx We note that this document is based on only 11 months of baseline data and so the figures presented are likely to change.</p> <p>However, these figures could be used here to give an indication of likely impacts from this project.</p> <p>For all species assessed, we suggest that a matrix table is included for summed annual cumulative impact assessment (to include all seasons, including the breeding season for all except red-throated diver) and that assessments are then made of the annual predicted mortalities against the baseline mortality of the largest BDMPS and the biogeographic population.</p>	The cumulative assessment has been updated to reflect the currently available data (section 13.8.2.6).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Red throated diver</p> <p>In addition to the general recommendations made for all species assessments, we also note the queries we have raised regarding the need to check the figures used in the displacement matrices for Vanguard West. Therefore, at present we cannot make comment/agree to the conclusions made in paragraph 376 regarding the level of impact from cumulative operational displacement to red-throated diver.</p>	This section has been updated (13.8.2.6.1).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Gannet</p> <p>In addition to the general recommendations made for all species assessments, paragraph 377 states: 'Norfolk Vanguard East and Norfolk Vanguard West are located beyond the mean maximum foraging range of gannets from breeding colonies in the North Sea. Therefore, displacement risk is only of concern outside the breeding season.' We note that Table 13.9 of the PEIR chapter lists the Flamborough & Filey Coast pSPA as being a minimum of 205km from Vanguard. Therefore, Vanguard is within the 229.4km mean-maximum foraging range of gannet from the Flamborough pSPA colony.</p> <p>As noted in our summary comment II above, breeding season impacts should also be considered and these should be summed together with the impacts from the non-breeding period (i.e. autumn and spring migration). The annual predicted mortality should then be assessed against the baseline mortality of the largest BDMPS and the biogeographic population.</p>	This section has been updated (13.8.2.6.2).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Auks</p> <p>In addition to the general recommendations made for all species assessments, we note that the assessments for all auk species have considered that an increase in mortality due to displacement from windfarm sites seems likely to be at the low end of the proposed 1 - 10% range, and a value of 1% when combined with the precautionary 70% displacement rate is considered appropriate for wintering auks. Whilst Natural England agrees that the mortality for auks is likely to be at the low end of the range, we do not agree that using 1% mortality for the cumulative assessment (with 70% displacement) can be considered the worst case scenario. Our recommendation is a range from 30% displacement and 1% mortality up to 70% displacement and 10% mortality, with 70% displacement and 10% mortality as the worst case. Which is the same worst case scenario as used in the assessment of the project alone.</p> <p>Whilst the mortality across the different seasons that make up the non-breeding season have been summed for the assessment of Vanguard West and East combined, there does not appear to be any displacement impacts in the breeding season from other North Sea projects added to the overall cumulative assessment of displacement impacts. As advised at EA3, we advise that a further assessment is undertaken that incorporates the cumulative impact across the whole annual cycle (including the breeding season), where seasonal impacts are summed. The cumulative total should then be assessed</p>	This section has been updated (13.8.2.6.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>against the appropriate scale (which was agreed at the first Offshore Ornithology Expert Topic group meeting would be both the BDMPS and the biogeographic population). The assessments should then look at what point 1% of baseline mortality (of BDMPS and biogeographic population) is exceeded, in order to make a judgement on whether the cumulative displacement impacts are significant at an EIA level for each auk species.</p> <p>We again note the recommendation that the sensitivity of guillemot and razorbill to displacement should be considered to be medium rather than low to medium.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Cumulative Assessment of Collision Risk Assessment</p> <p>As with cumulative displacement, for all species assessments we note that the figures for Vanguard may potentially change once the remaining 6 months of data have been included for Vanguard West (March-August 2017).</p> <p>The assessments for all species are based on taking the cumulative figures presented for EA3 and adding the Norfolk Vanguard predictions to these totals. Therefore, the cumulative figures presented do not include figures for Hornsea 3 – whilst figures may not have been available at the time of drafting this PEIR, the Hornsea 3 PEIR has been submitted at Section 42 and is available at: http://www.dongenergy.co.uk/en/Pages/PEIR-Documents.aspx We note that this document is based on only 11 months of baseline data and so the figures presented are likely to change. However, they could be used here to give an indication of likely impacts from this project.</p> <p>The figures presented in the cumulative collision tables for lesser black-backed gull, herring gull and great black-backed gull for the various Vanguard scenarios are for Option 2 (Tables 13.77-13.79). This is due to the number of records of these species in flight from the current data set used being less than 100 records. This should be revisited once the remaining 6 months of data for Vanguard West are included. We also note our suggestion made above that all the data from the Vanguard East and West sites + 4 km buffers are used for calculating %PCHs and informing which</p>	This section has been updated (13.8.2.7).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>'basic' Band option is most appropriate in order to maximise the data set.</p> <p>The assessments for all species (except gannet) states '...The only projects consented after November 2014 are Hornsea Project 1, Dogger Bank Creyke Beck A&B and Dogger Bank Teesside A&B. Therefore, the previous cumulative annual collision total excluding these three projects would have been...'</p> <p>We note that both Hornsea 2 and EA3 have also been consented after November 2014, so we suggest that this is updated to reflect that.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Gannet</p> <p>Paragraph 442 notes the work undertaken by APEM at Greater Gabbard that suggest gannet avoidance rate should be even higher than 98.9%. Natural England acknowledges the findings in APEM (2014) that use of the 98.9% avoidance rate for the basic Band model may overestimate collision predictions. At present our advice regarding gannet avoidance is as per the joint Statutory Nature Conservation Bodies response to the Marine Scotland review of avoidance rates report by Cook et al. (2014), i.e. 98.9% avoidance rate for gannet with the basic Band model. As this study is based on just 8 gannets entering the offshore wind farm, there is not enough evidence to robustly determine the avoidance rate. However, we welcome future monitoring along the lines of the APEM (2014) study to determine an appropriate avoidance rate for gannet. The cumulative CRM annual total for gannet based on the data that has been included in the PEIR is between 2,967 and 3,168, which equates to 3.40-3.63% of baseline mortality for the largest BDMPS (autumn migration in Furness 2015) and 1.32-1.41% of baseline mortality for the biogeographic population, which is a significant impact and therefore requires further consideration. We note and welcome the use of the SOSS gannet PVA model outputs (WWT 2012) and that even when the west coast offshore wind farms are included (giving a cumulative total of between 3,000-3,200 collisions) the cumulative total is below the figure predicted by the WWT</p>	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>(2012) density independent model of 10,000 individuals per year before the population growth would not remain positive, and just above the 95% confidence interval on population growth, which remained positive until additional mortality exceeded 3,500 individuals. However, we note that the national population has increased since the WWT model, so thresholds would also have gone up.</p>	
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 448 notes that the relative contribution of the proposed Norfolk Vanguard project to this cumulative total is small. We note that based on the data that has been included in the PEIR, the Vanguard contribution of 93-293 gannet collisions to a cumulative total of 2,967-3,167 collisions is 3.13-9.25%, which does not seem that small.</p>	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 453 notes the review of nocturnal flight activity undertaken for EA3 and that this suggests that nocturnal activity for kittiwake is too high and reducing this could reduce the overall cumulative collision estimate by 7-25%, so again the cumulative figures are likely to be an overestimate. Natural England notes that a review of nocturnal activity has indicated that the value of 50% used in CRM is likely to be an over estimate. However, we note that there has been no proposal/evidence collected validating assumptions about nocturnal activity. This could be something that the regulators and industry consider as part of any monitoring conditions within marine licences.	As noted above, work is ongoing in relation to this aspect for kittiwake. The collision assessment has been revised to reflect the current thinking on this parameter.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Paragraph 454 refers to the PVA model that was developed at EA3 to assess the potential effects of cumulative mortality on the kittiwake BDMPS populations (EATL 2015). It notes that using the density dependent model, cumulative annual mortality of 4,250 individuals (assessed against the larger autumn BDMPS population) was predicted to result in the population after 25 years being 3.6% to 4.7% smaller than that predicted in the absence of additional mortality. We advise that the density independent model outputs are also presented/considered here.	This section has been updated (13.8.2.7.2).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Paragraph 454 refers to the PVA model that was developed at EA3 to assess the potential effects of cumulative mortality on the kittiwake BDMPS populations (EATL 2015). It notes that using the density dependent model, cumulative annual mortality of 4,250 individuals (assessed against the larger autumn BDMPS population) was predicted to result in the population after 25 years being 3.6% to 4.7% smaller than that predicted in the absence of additional mortality. We advise that the density independent model outputs are also presented/considered here. Paragraph 455 states: ‘...the worst case cumulative collision mortality is considered to be of low to medium magnitude, resulting in impacts of minor to moderate adverse significance. However, when the various sources of precaution are taken in to account (precautionary avoidance rate estimates, reduction in wind farm size, over-estimated nocturnal activity) the cumulative collision risk impact magnitude is reduced to low, and the impact to minor adverse significance.’ Given that the British kittiwake population is declining and based on the figures currently presented, we do not agree with the reduction of the significance from minor to moderate adverse significance to minor adverse significance. This is because the figures currently presented for cumulative kittiwake collision mortality for the various Vanguard scenarios equate to 2.86-3.24% of baseline mortality for the largest BDMPS population and 0.47-0.53% of baseline mortality for the biogeographic population, which is not</p>	This section has been updated (13.8.2.7.2).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>insignificant and requires further consideration. Based on the current figures, Vanguard contributes 6.9-17.7% of the total kittiwake cumulative CRM collision figure, which appears to be a fairly sizeable contribution to the overall total.</p> <p>We would welcome any proposals of best practice mitigations that seeks to reduce the in-combination collision total, for example by raising the height of the lower rotor tip of the turbines (which would also be relevant for other species in seeking to reduce the in-combination collision total). Also, it would appear that based on the current build out scenarios considered that Option 4 (67% of capacity in Vanguard East and 33% in West) represents the worst case option in terms of kittiwake collisions from the Vanguard project (this is also the case for all other species considered for CRM except LBBG based on the data currently available). Therefore, we would also suggest that further information is given on the likelihood of each build out scenario occurring.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Lesser black-backed gull (LBBG)</p> <p>Based on the data currently presented the total cumulative LBBG CRM total is between 524 and 562 collisions per annum, which equates to between 1.99-2.14% of baseline mortality for the largest BDMPS (autumn migration in Furness 2015), which is not insignificant. However, the cumulative CRM total equates to 0.48-0.52% of baseline mortality for the biogeographic population. The impact likely lies somewhere between the ranges of these figures. We suggest that the assessment of the predicted impact also considers the population trend of the population the assessment is dealing with. Based on the current figures, Vanguard contributes 9.5-15.6% of the total LBBG cumulative CRM collision figure, which appears to be a fairly sizeable contribution to the overall total.</p>	This section has been updated (13.8.2.7.3).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Herring gull</p> <p>Based on the figures presented in the PEIR, the total predicted cumulative herring gull CRM total is 705-732 collisions per annum, which equates to 0.88-0.91% of baseline mortality for the largest BDMPS (non-breeding in Furness 2015) and 0.37-0.39% of baseline mortality for the biogeographic population. Therefore, at this level of increase to baseline mortality we would agree with the conclusion of a minor adverse impact significance. We would also suggest that the assessment of the predicted impact also considers the population trend of the population the assessment is dealing with.</p>	This section has been updated (13.8.2.7).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Great black-backed gull (GBBG)</p> <p>Based on the figures presented in the PEIR, the total predicted cumulative GBBG CRM total is 881-939 collisions per annum, which equates to 5.21-5.26% of baseline mortality of the largest BDMPs (non-breeding in Furness 2015) and 2.03-2.16% of the baseline mortality of the biogeographic population, which is not insignificant and requires further consideration. We suggest that this could be done by considering the approach we outlined to Norfolk Vanguard in our response following the first Offshore Ornithology Expert Topic Group meeting (outlined in our comments on the Consultation section above).</p> <p>We note that reference has been made to the decision at Rampion (in paragraphs 476-477), but no reference is made to the PVA constructed for GBBG for EIA scale at EA3. We would suggest that reference is made to the outputs of this here, including reference to the density independent model outputs. We suggest that the assessment of the predicted impact also considers the population trend of the population the assessment is dealing with.</p> <p>Based on the above, we currently do not agree with the conclusion of a minor adverse impact significance. The figures presented in the PEIR suggest that Vanguard contributes 4.64-10.53% of the total GBBG cumulative CRM collision figure, which appears to be a fairly sizeable contribution to the overall total.</p>	This section has been updated (13.8.2.7.4).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Transboundary Impacts: We note that no transboundary impacts have been considered in the PEIR – is this because these have been screened out? If this is the case, then justification should be provided on the reasons for this.	Transboundary impacts have been considered in relation to designated sites in the Habitats Regulations Assessment.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	13.10 - We suggest that this section is updated in light of the comments made above and once all the data are incorporated into the assessments.	This section has been updated (13.12).
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Are any data available on bird flight directions and age class proportions from the aerial survey data? – as this may be useful to inform whether lesser black-backed gulls (LBBG) recorded in June and July in Vanguard West may be immatures rather than breeding adults (will also potentially be useful for other species and the conclusions currently made that birds present at the Vanguard sites in the breeding season are immatures). Flight direction data may provide information to suggest that birds recorded at the site are heading in the general direction towards or away from breeding colonies (e.g. for LBBGs heading either to or from the Alde-Ore Estuary).	A further review of the survey data was conducted to investigate these suggestions. The results of this analysis are provided in Technical Appendix 13.1 Annex 8 and have been used to inform the relevant sections of the assessment.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Table 14 – Species biometrics used in CRM: Clarification is needed on the sources of information for each of the biometrics presented in this table.	These are standard metrics as used in recent assessments.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	<p>Clarification is required in the headings for all results tables presented on which avoidance rate has been used – we assume it is the one recommended in the SNCB response to Cook et al. (2014), i.e. 98.9% for gannet and kittiwake; 99.5% for lesser black-backed gull, herring gull, great black-backed gull; and 98% for all other species not covered by Cook et al. (2014) and the joint SNCB response.</p> <p>Clarification is also required in the headings for all results tables regarding which generic flight height data set (e.g. median, upper or lower confidence level) have been used for the Option 2 outputs presented – we assume it is the median data set.</p>	Additional clarity on this matter has been provided.
Chapter 13 Offshore Ornithology	Natural England	11th December 2017	Helicopters represent a very loud and disturbing form of transport and are known to disturb birds. Any use of helicopters will have to be assessed, with various conditions likely required, such as: certain flight heights and flight paths and the speed at which altitude is gained. This is particularly important when transiting over protected sites.	This aspect has been considered in section 13.7.4.
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	The RSPB is unable to agree at this stage that no impacts greater than minor significance will occur to ornithological interests as a result of offshore elements of the project. Our concerns relate principally to collision risk to gannet and kittiwake, particularly in relation to the Flamborough and Filey Coast pSPA, lesser black-backed gull of the Alde-Ore Estuary SPA and great black-backed gull. Whilst at this stage our concerns relate primarily to cumulative impacts,	The relevant sections of this assessment provide full details of the predicted impact magnitudes and significance, with justification for the conclusions reached.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>given the level of collision risk predicted at this stage for this project and more generally in the southern North Sea, we consider it likely that the Habitats Regulations Assessment is required due to further concerns relating to the project in-combination with others, and possibly the project alone.</p>	
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>The PEIR throughout makes the assertion that birds present in the breeding season are unlikely to be breeding birds, and makes erroneous statements regarding foraging ranges, such as in para. 377 which states that Norfolk Vanguard is outside the mean-max foraging range of gannet from North Sea colonies. At 205km from the Flamborough and Filey Coast (FFC) pSPA, Norfolk Vanguard is within the mean-max foraging range of gannet (229km). It is also within the meanmax foraging range of lesser black-backed gull (141km), being sited 92km from the Alde-Ore Estuary SPA. Non-breeding adults and juveniles which are part of SPA populations may also be present and should be considered as they could breed in future.</p>	<p>These aspects have been reviewed and updated in the relevant sections of this ES.</p>
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>The RSPB considers that any decision to screen species out from further assessment should be properly justified. Para. 326 explains that collision risk to little and common gulls is screened out from further assessment as annual collisions are less than 30. We consider that this is an arbitrary threshold and that further justification for this should be given.</p>	<p>The collision assessment has been further refined for this ES and screening decisions have been supported with evidence as appropriate .</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	We note that apportioning of offshore impacts (collision risk and displacement) to SPAs both alone and in-combination with other projects has not yet been carried out and that this will need to be addressed to ensure compliance with the Habitat Regulations requirements.	This aspect has been addressed in the Information to support the Habitats Regulations Report.
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>We note that the migration-free breeding season has been used rather than the standard breeding season as it is assumed that there is a very low presence of breeding birds within the project area. We disagree with this assumption, as explained in point 1. For example for gannet, the migration-free breeding season excludes March and September, which reduces the number of predicted collisions. But gannets start arriving in January and establishing their nest sites in March. Whilst peak fledging is in August, some birds are still fledging in September, hence there is a strong argument for considering these months to be part of the breeding season.</p> <p>For kittiwake, the migration-free breeding season excludes March-April and August, which again significantly reduces the number of collisions. The first kittiwakes arrive at the colony in February, with most birds back by March and remaining until August, hence there is a strong argument for considering March, April and August to be part of the breeding season. If figures for the migration-free breeding season are to be presented, we consider that it would be necessary to attribute birds in the crossover months to breeding and dispersal in order to ensure collision risk to breeding birds is not underestimated.</p>	We note the RSPB's position on the assignment of months to appropriate biological seasons. This is complicated by the fact that there may be both migrating and breeding individuals of the same species present in any given area at the same time, albeit from different colonies. The determination of how to accommodate this has been based on the best available evidence and is defined in section 13.6.2.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>We would therefore like to see cumulative mortality figures presented for the standard breeding season (alongside the migration-free breeding season, if required), as well as the autumn period, so that the contribution of the different seasons to total annual mortality can be determined and, for the purposes of HRA, impacts on the FFC pSPA understood more clearly.</p>	
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>For collision risk modelling of breeding season gannet, kittiwake and lesser black-backed gull, a biologically defined minimum population size (BDMPS) for 'breeding season populations of nonbreeding individuals' is calculated based on the percentage of the spring BDMPS which are subadults (Para. 332). This equates to 40% of the spring BDMPS for UK North Sea and Channel for gannets, 47.3% of the spring BDMPS for kittiwake and 42.8% of the spring BDMPS for lesserblack-backed gull.</p> <p>We do not agree, as stated in point 1 above, that there is sufficient evidence that all birds present in the breeding season are likely to be non-</p>	This aspect of the assessment has been reviewed and updated where considered necessary.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>breeders. We also would not agree that these assumptions could be used to avoid apportioning any impacts to the SPAs in the HRA. We note the proposal to try to use aerial images to provide ageing data and inform proportion of adults/immatures in breeding season and look forward to seeing further information about this in due course.</p>	
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>Para. 313 notes that an avoidance rate (AR) for gannet of 98.9% is used for all seasons. This is also presented as likely to overestimate gannet mortality due to work by APEM (2014) which proposed a rate of 99.5% during autumn migration.</p> <p>Whilst the RSPB accept the SNCB's recommended amendment to the gannet AR (from 98% to 98.9%) for non-breeding birds, we do not agree that this figure should be applied to the breeding season due to the lack of available evidence relating to breeding birds. The reason for the difference between Natural England and the RSPB in their preferred avoidance rates for gannet is that the avoidance rate review carried out by the BTO for gannet was almost entirely based on birds outside the breeding season. It would be expected that breeding gannets would behave differently from non-breeding birds, and recent work by Cleasby et al. (2015), demonstrated that</p>	The collision modelling assessment has been revised since the PEIR and updated where it was considered appropriate. Uncertainty has been included in the collision risk assessment as advised by Natural England.

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			<p>foraging birds flew higher, and were therefore at greater risk of collision, than commuting birds. In light of this recent evidence, and given that the BTO review was so heavily biased to non-breeding birds, while we accept the rate for non-breeding season, we prefer a lower, more precautionary rate for the breeding season. We therefore consider that an AR of 98% should be presented for the breeding season. The current SNCB advice also highlights that due consideration should be given to uncertainty in collision risk estimates, including the use of confidence intervals around the avoidance rates and flight height estimates.</p>	

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Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>Para. 314 - 316 states that nocturnal activity rates are 'almost certainly overestimates'. Nocturnal activity is one of a number of variables included in the Band model process, and recent work by Masden (2015) has indicated how important consideration of these variables is. As such we welcome this review of nocturnal activity. However, we would caution against the use of such a review to make overarching comments on the over-estimation of collision risk at all sites at all times of year. For example, the studies reviewed for non-breeding gannets are robust, and therefore the conclusions are useful. However, for breeding gannets, the authors cite work by Warwick-Evans et al. (2015). Again, this is a robust study, but we would point out that this reported the highest levels of gannet activity between the hours of 0400 and 0600 in the morning, with a slightly lower peak between 0300 and 0400. Activity associated with foraging by plunge diving, when collision risk is greatest, was highest between 0500 and 0600 and between 1900 and 2000. The purpose of differentiating between night-time and daytime flight activity, as detailed in the Band model guidance, is simply to separate between times when surveys take place (daytime) and where they do not (night-time) and the flight activity factor applied is a correction for this. While timings for when the aerial surveys were carried out are not presented, it is unlikely that surveys were carried out so far from shore between 0300 and 0600, and between 1900 and 2000, and as such the results for gannet could</p>	<p>Further work on this aspect has been undertaken and is in the process of being published in the scientific literature. The RSPB, among others, has had the opportunity to review and provide comments on these studies.</p> <p>The collision modelling has been revised since the PEIR and this includes consideration of nocturnal activity levels. Further details are provided in section 13.7.5.3 and in Technical Appendix 13.1.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>omit a large part of flight activity and therefore produce a potentially serious underestimation of collision risk. This would also be relevant should it be intended to apply the proposed reductions in CR to other windfarms as part of the cumulative/in-combination assessment, as it is unlikely that the timings of surveys undertaken will be known. As such, while a review of the input variables to the Band modelling process is welcome, it is not possible to draw the overly simplistic conclusion that modelled rates of collision mortality are over-estimates.</p>	
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>The assessment of CR to migrant non-seabirds is taken from work carried out for East Anglia THREE. Para. 319 notes that the population and flight activity data used in that assessment have not been updated. As discussed at a recent Topic Group meeting, we recommend that this assessment is updated to include more locally relevant species, such as those from the Breydon Water, Broadland and North Norfolk Coast SPAs. These may also require consideration in the HRA.</p>	<p>The species named as features at these SPAs were included in the previous work which has been cited for this assessment and there is no evidence to suggest that the results are not valid for this adjacent project.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	As noted above, we do not agree that cumulative collision risk to gannet, kittiwake and great black-backed gull can be considered to be of minor negative significance. These impacts should be regarded as of moderate significance.	Impacts have been reviewed since the PEIR and revised as necessary.
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	We note that other Tier 4 windfarms are included in the cumulative collision risk modelling on a qualitative basis only, and therefore that figures from Hornsea 3, which may be significant, are not included. These figures should be obtained and presented.	The best available data for sites currently in planning have been included in the assessment where possible.
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	Para. 440 states that many of the collision estimates for other windfarms are based on higher numbers of turbines than were actually installed – based on a method of updating collision estimates presented by EATL (2016) this is stated to overestimate mortality by 13% for gannets, 15% for kittiwakes, 35% for lesser black-backed gull, 30% for herring gull and 30% for great black-backed gull. This is an acceptable point for windfarms where the DCO has been amended and therefore there is legal certainty regarding the reduction, but where windfarms still have their original DCOs, it is not appropriate to do anything less than assess the full extent of those DCOs when considering in-combination/cumulative effects.	The legal argument is acknowledged and the tables of cumulative collisions provide consented collision estimates. However, it remains informative to consider the extent to which these are over-estimates for the reasons stated.

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Chapter 13 Offshore Ornithology	RSPB	11th December 2017	Para. 454 notes that the EATL density dependent population viability analysis (PVA) outputs for kittiwake indicate an up to 4.7% reduction in population size after 25 years. This is compared to British kittiwake population change over 15 year intervals between censuses (+24%, -25% and -61%) to conclude that change due to windfarms will be undetectable. However, we consider that only the density independent model is robust because results from versions that include density dependence are sensitive to the assumptions made about its strength. The true strength of density dependence is unknown for these seabird populations, therefore density independence is the precautionary approach and so should be considered. Note that density independence may not generate the worst case scenario, as should density dependence be compensatory, impacts could be greater.	Further consideration of density dependence in population modelling is provided in relevant sections.
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	Species from the Greater Wash SPA require consideration of displacement impacts during construction (particularly tern species)	The scope of the construction impact assessment has been increased to consider other potentially sensitive species.
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	As noted above the RSPB considers that any decision to screen species out from further assessment should be properly justified. Cumulative gannet displacement in the breeding season is screened out on the basis that Norfolk Vanguard is outside the mean max foraging range of North Sea gannet colonies. Table 13.9 shows Norfolk Vanguard to be 205km from FFC pSPA (minimum distance) and so within the 229.4km mean max foraging range of gannets from this colony. Breeding season displacement for gannet	Screening justifications have been revised and updated as necessary.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>is not presented due to 'low' numbers of birds at this season. The Norfolk Vanguard contribution appears likely to be small based on comparison of annual figures with other seasons in Table 13.34 so screening out may be acceptable, but justification for this on the basis of foraging range is not.</p>	
Chapter 13 Offshore Ornithology	RSPB	11th December 2017	<p>Cumulative displacement for guillemots is presented for the 'midwinter' period only, despite significant numbers present in Norfolk Vanguard during the breeding period (1501 during standard breeding season). We recommend that figures for the breeding season are also presented.</p>	<p>The displacement assessment has been updated and revised with consideration for all seasons included as necessary.</p>
Chapter 13 Offshore Ornithology	Ministry of Infrastructure and Water Management Netherlands	11th December 2017	<p>Chapter 13 on offshore ornithology has a clear structure, with a good description on used methodology. Some remarks though:</p> <ul style="list-style-type: none"> • Conclusions on cumulative impacts are less clear and structured: worst case estimates of collisions/displacement are given followed by a (qualitative) reasoning that actual impacts will be lower. • Attention could also be paid to possible mitigating measures to reduce the impacts, disregard if this is a significant effect or not. <p>We also note that the impact of wind parks in the Netherlands, Belgium and Germany are not taken into consideration. For bird populations which have the Southern North Sea as habitat, an international cumulative approach would be required. Within the international cooperation of North Sea countries as a follow-up of the Political</p>	<p>The cumulative impact assessment sections have been revised and updated as necessary.</p> <p>Mitigation has been considered where appropriate.</p> <p>Transboundary impacts have been considered in section 13.9.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>declaration on Energy Cooperation (also signed by the UK) such an approach is looked into and developed further.</p>	
<p>Chapter 13 Offshore Ornithology</p>	<p>Ministry for the Environment, France</p>	<p>11th December 2017</p>	<p>Some of the wind turbines part of the project will exceed 325 meters above sea level. The rotor and the tower of a wind turbine could increase exposure to the hazards of bird strike. It means that a wind farm project could be a threat for the movement of birds.</p> <p>The Norfolk Vanguard wind farm project, near the East Anglia THREE wind farm project, is located in two main migration corridors.</p> <p>The barrier effect of a wind turbine is also a reality for the marine wildlife.</p>	<p>These aspects (barrier effects and collision risk) have been considered and assessed in full in this ES.</p>

Feedback related to Commercial Fisheries (Chapter 14 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	Vattenfall should note that Eastern IFCA are seeking small-scale fishing closures (via a byelaw) to protect sensitive features within the inshore section (within six nautical miles of the shore) of the SCI. These closures are yet to be finalised, but any works in this area will need to proactively take into consideration up-to-date closures and the latest available information on the location of sensitive species and habitats. Eastern IFCA will ensure that any changes to existing fishery closures are duly publicised.	Noted.
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	The East Marine Plans support sustainably-developed offshore wind energy generation projects. There are many of such projects in the southern North Sea, including Dudgeon, Sheringham Shoal, Scroby Sands, Race Bank, Triton Knoll, Lynn & Inner Dowsing, Lincs, and East Anglia offshore windfarms as well as other projects and plans. While Eastern IFCA appreciates that the cumulative impacts of Norfolk Vanguard with Norfolk Boreas and East Anglia THREE offshore wind farms have been comprehensively assessed within this PEIR, Eastern IFCA would encourage further assessment on an ongoing basis of the cumulative impacts of all Southern North Sea wind farm activity, as well as other activities including aggregate extraction activities. The impacts of these projects on the marine environment and fisheries should be assessed in-combination, highlighting any potential cumulative effects associated with the	The assessment of cumulative impacts (Section 14.8) takes account of consented and proposed offshore wind farm projects in the former East Anglia Zone and the wider area, including both UK and non-UK projects. Operational offshore wind farm projects are considered to form part of the existing environment and therefore have not been included in the cumulative assessment. In addition to offshore wind farms a range of other projects/activities have also been given consideration for assessment of cumulative impacts, including aggregate dredging areas (Section 14.8).

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			licence application and guiding decision-making and plan implementation in a stepwise approach.	
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	Where conclusions have been drawn within the PEIR that the project could have cumulative impacts with other plans/projects, these should be mitigated for wherever possible. This includes mitigation of the cumulative impacts on offshore ornithology, marine mammals and commercial fisheries.	The cumulative effects of the project in conjunction with other projects and activities are assessed in Section 14.8. The cumulative assessment carried out did not identify significant cumulative impacts on fisheries receptors. Specific mitigation in respect of cumulative impacts, additional to those proposed in the assessment of the project alone have therefore not been proposed. Cumulative impacts on seabirds are discussed in Chapter 13 Offshore Ornithology. Cumulative impacts on marine mammals are discussed in Chapter 12 Marine Mammals.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	<p>The PEIR documentation states “export cables would be buried where possible, with typical target depths of between 1m and 3m”. However, it states where cables cannot be buried due to cable crossings or where they become unburied over time due to mobile sediments alternative methods of protection may be required.</p> <p>Alternative protection methods could include rock placement, concrete mattresses, use of grout or sand bags, frond mattresses, and/or the use of uradact or similar shells. These alternative methods are not in keeping with the East Marine Plans. Every effort should be made to maximise the length of cables that are buried and maintain burial over time. Using cable armouring instead of cable burial increases the likelihood of adverse environmental and fishery impacts. It is anticipated that 60km of export cable will become unburied during the life of the project. If not buried, the presence of the export cable can result in snagging of fishing gear. This poses a significant safety implication particularly for small vessels operating in the area, could result in semipermanent exclusion of fishing activities from the area, and is therefore a concern for Eastern IFCA.</p>	<p>As described in Section 14.7.1, Norfolk Vanguard Limited is committed to using a HVDC solution in order to reduce the number of export cables and volume of cable protection required. In addition, Norfolk Vanguard is committed to bury cables where feasible further reducing the need for cable protection.</p> <p>An Outline Scour Protection and Cable Protection Plan (Document 8.16) is provided with the Norfolk Vanguard DCO Application. A cable burial risk assessment will be undertaken post consent, in consultation with stakeholders.</p> <p>The exact method for cable crossings will be subject to crossing agreements; however the worst case scenario for cable protection is described in Section 14.7.3</p> <p>Post-lay and burial inspection surveys will be undertaken. In addition to burial status, these will identify the presence of construction related seabed obstacles and, where appropriate and practicable rectification works would be undertaken.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	The proposed works must strive to avoid displacement of other legitimate uses of the sea, including recreational and commercial fishing. The section of the cable corridor and surrounding areas that are within the Eastern IFCA district lie in important fishing grounds, particularly for crab, lobster and whelk potting. There are also small-scale netting and trawling fisheries in this area, targeting a range of species including herring and occasionally shrimps. Although the level of fishing effort occurring inshore is much smaller than that applied by larger (predominantly Dutch) offshore fishing vessels, displacement (for example during construction or maintenance works, or because of cable exposure) can have disproportionately large effects on inshore fisheries, which are characterised by small vessels operating within a short range from launch sites.	The potential loss or restricted access to traditional fishing grounds has been considered for assessment within this chapter (Section 14.7 and Section 14.8) Similarly, potential issues associated with displacement of fishing into other areas have also be given consideration within the assessment presented in this chapter for all commercial fisheries receptors, including local fleets (Section 14.7 and Section 14.8).
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	Eastern IFCA supports the proposed use of local Fisheries Liaison Officer, the Kingfisher Information Service and Notice to Mariners to minimise disruption to fishers; this communication is extremely important and should be carried out on a continuous basis and well in advance of scheduled works and closures during every phase of the development.	Noted. As described in Section 14.7.1 Notice to Mariners (NtMs), Kingfisher notifications and other notices as required, will be issued to fishermen in an efficient and timely manner.
Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	Appropriate liaison with fishers should ensure there are no conflicts with static gear within the area and no displacement of fishing activity into other areas during the construction phase, despite these being deemed effects of low magnitude.	Appropriate liaison with the fishing industry will be maintained throughout the construction and operation phase, and recommendations for effective fisheries liaison adhered to as endorsed by FLOWW Best Practice Guidance for Offshore Renewables Developments (2014) (Section 14.7.1).

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Chapter 14 Commercial Fisheries	Eastern IFCA	October 2017	Eastern IFCA is continually seeking to improve how we respond to consultations, both in terms of efficiency and meaningful content. Therefore, if any of the points raised in this response is reflected in the licence outcome, we would appreciate if you could inform us.	Noted . A follow up meeting can be arranged with EIFCA as required.
Chapter 14 Commercial Fisheries	French Transboundary (Ministry for the Environment, France)	October 2017	There is a clear impact on professional sea fishing, especially for Dutch and Belgium fishers. Even though, the impact on French professional fishers is very limited, we have to take into account the potential impact of the movement of foreign ships in the French fishing area. This concern is due to the rising presence of windfarm projects in the North Sea.	Consideration has been given to the potential impacts of the project on all fishing fleets active in areas relevant to Norfolk Vanguard, including the French fleet (Section 14.6.5). The potential impact of loss of fishing grounds and subsequent potential for displacement has been assessed for the project alone and cumulatively with other projects (Section 14.7.4.7 and Section 14.8).
Chapter 14 Commercial Fisheries	French Transboundary (Ministry for the Environment, France)	October 2017	A public enquiry has been organised from November 6 2016 to December 16 2016 from the city of Bray-Dunes (Department du Nord) to the city of Etaples (Department du Pas-de-Calais). The purpose of this consultation was to understand and to provide an analysis of the potential impacts of the windfarm projects about: marine environment, activities in relation to sea fishing and marine navigation. Following the public consultation the commission of inquiry has considered that the environmental impact on French coasts and marine environment remain low in view of the distance between British windfarm projects and French coasts.	Noted.

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Chapter 14 Commercial Fisheries	French Transboundary (Ministry for the Environment, France)	October 2017	In regard to the location of the project the potential environmental impact could be very limited due to the distance between the Norfolk Vanguard project and the French coastline. However considering the potential impact of the rising presence of windfarm projects this new project will have to take account of the cumulative impacts generated by all the activities in the affected area (potential impacts in terms of pollution produced over time by heavy metals). Specific measures will have to be taken to preserve the environmental sphere. It seems helpful to provide a global study about the environment impacts of the windfarm projects who have already been allowed. This research could help to understand the global assessment of the windfarm projects in the North Sea.	Noted. Consideration has been given in this assessment to the potential for the project to result in cumulative impacts on commercial fisheries in conjunction with other projects, both in UK and non-UK waters (Section 14.8.). The undertaking of a global study on the environmental impacts of windfarm projects already operational is outside of the scope of this ES. Where relevant, however, lessons learned and knowledge from the experience of operational projects has been taken account of in this chapter (Section 14.7).
Chapter 14 Commercial Fisheries	Ministry of Infrastructure and Water Management Netherlands	October 2017	I am happy to note that you comply with the arrangements for East Anglia as commented by Rijkswaterstaat (distance between shipping route and wind park) with reference in Appendix 15.1 section 17.3.2 to the IMO advice.	Noted.
Chapter 14 Commercial Fisheries	MMO	October 2017	It is described that the windfarm could be built in either one, two or three stages spanning a considerable time. Consideration needs to be given as to how the Development Consent Order (DCO) is to be structured to ensure interim monitoring between stages is conducted which takes into consideration any changes either in designation, conservation statuses, fishing practices, navigational issues or benthic habitat changes.	Since the submission of the PEIR the project construction programme has been refined and now only considers a single or two phase approach for construction. This would result in a maximum construction period of up to 2 years over a 4 year offshore construction works programme window (two phase approach). An In Principle Monitoring Plan has been submitted as part of the DCO application which outlines proposed monitoring as required.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	MMO	October 2017	<p>The MMO notes that a burial depth of between 1 and 3m is assessed as the expected burial depth where possible. A cable burial risk assessment is proposed preconstruction to assess cable burial issues. The MMO considers cable burial risk assessment as an ongoing process which also needs to be conducted post construction in real time situations especially if cable exposures occur during the operational phase to fully understand and mitigate risks to other sea users. The MMO would like to see that concept addressed within the PEIR.</p> <p>Based on issues already experienced, the MMO would require further information of how risks are to be communicated to fishermen and other sea users. The risk assessment would also need to include details of varying levels of mitigation required to address different levels of risk situations.</p>	<p>As described in Section 14.7.1, once cables are installed into the seabed, post-lay and burial inspection surveys will also be undertaken..</p> <p>Potential risks will be communicated to fishermen through appropriate channels (i.e. NtMs, Kingfisher bulleting) following the procedures identified in the Fisheries Liaison and Co-existence Plan which will be produced for the project post consent.</p>
Chapter 14 Commercial Fisheries	MMO	October 2017	<p>The MMO would welcome more information on how the trawl-ability of the seabed after the construction of the windfarm is going to be assessed and how this is to be communicated to the fishing industry.</p>	<p>As described in Section 14.7.1, post-installation surveys would be undertaken to assess the seabed status. In the event that sea bed rectification procedures are required, and where feasible, the appropriate measures would be undertaken. Detail describing operations and maintenance of export cables is provided in Chapter 5 Project Description.</p> <p>In the event that cables become unburied during the operational phase it is anticipated that this would be communicated to the fishing industry through the use of a dedicated FLO and appropriate channels such as KISORCA, Kingfisher, etc. Further detail will be captured at a later stage within the FLP.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	MMO	October 2017	If during construction, any unused cables are to be cut and clumped at the point of intersection with the windfarm cables, this will have to be licensed to ensure that the location of the clumped cables is known and communicated as a potential navigational risk to other sea users.	As outlined in Section 14.7.1, appropriate communication channels will be established to ensure that fishermen are aware of works being undertaken and of the presence of any items which may accentuate risk.
Chapter 14 Commercial Fisheries	MMO	October 2017	The MMO notes that Vattenfall has stated cable protection to be kept to a minimum which is to be welcomed. However, contingency for unexpected exposures/unburied cables should be built into the assessments.	As described in Section 14.7.1, once cables are installed into the seabed, post-lay and burial inspection surveys will be undertaken. In addition, potential risks associated with unexpected exposures/unburied cables will be communicated to fishermen through appropriate channels.
Chapter 14 Commercial Fisheries	MMO	October 2017	Brown crab, lobster, common whelk and shrimp are the most important commercial shellfish species within the area, with the majority of potting effort being concentrated in inshore waters in the vicinity of the proposed cable corridor. Most vessels targeting these species will likely be small (<10m) beach-launch boats, and as such, are likely to be more vulnerable to displacement resulting from the works than larger vessels. The MMO notes that this has been recognised and addressed within the PEIR.	Noted.
Chapter 14 Commercial Fisheries	MMO	October 2017	Effort by the under 12m fleet is often underestimated as they aren't required to carry VMS and may be missed by overflight surveys. With this in mind, the consultation with local fishers and representatives of the fishing industry is vital to ensure the activity of fishers is captured. Such consultation results should be included in the EIA to support the assessment.	Extensive consultation has been carried out with the fishing industry to help inform this assessment, including consultation with local fleets (Table 14.4). Consultation with local fishers and representatives will be ongoing throughout the lifetime of the project and in accordance with the FLP.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	MMO	October 2017	<p>The PEIR has identified that the construction phase of the cable corridor is likely to result in a moderate adverse impact upon the <15 fleet through temporary loss of access to fishing grounds during installation of the offshore cable corridor. It is suggested that mutually acceptable procedures will be put in place for the relocation of static gear which would be sufficient to reduce the impact to minor adverse significance. A description of the possible procedures should be included in the EIA and DCO.</p> <p>A plan for alternative mitigation should be included if fisheries are unwilling to relocate their gear or if gear relocations are not deemed feasible.</p>	<p>If gear relocation is required during construction, this will be discussed with local fisheries stakeholders and their representatives. Norfolk Vanguard Limited would seek to reach evidence based commercial agreements with affected fisheries stakeholders, where justified, in line with FLOWW Guidelines.</p>
Chapter 14 Commercial Fisheries	Departmental Directorate of the Sea and Territories of Pas-de-Calais	October 2017	<p>The area is not densely fished by French vessels. However, displacement of activity to grounds targeted by French vessels could increase competition and put the French fleet in a difficult position. This includes vessels based in Dunkerque as well. Cable burial could contribute to minimise potential effects on fishing activity as well as EMFs on sensitive species. Appropriate consultation with fishermen and their representatives is necessary. Aspects such as fishing in OWF should be thought through.</p>	<p>The potential for loss of grounds and restricted access to fishing grounds and associated displacement is considered within the assessment, for all fleets, including the French fleet (Section 14.7). Consultation was undertaken with the CRPMEM on 14th March 2017 (Table 14.4) to discuss issues in relation to French fishing activity and the project. As described in Section 14.7.1, Norfolk Vanguard Limited is committed to bury cables where possible. Impacts associated with EMFs on sensitive species are assessed in Chapter 11 Fish and Shellfish Ecology. Consultation with the fishing industry will be on-going through-out all stages of the project. The potential for fishing to resume within the operational OWF sites has been given consideration within the impact assessment (Section 14.7).</p>

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Chapter 14 Commercial Fisheries	Prefecture Maritime Manche Mer du Nord	October 2017	It would be useful to examine in great detail real impacts on French marine activities, specifically commercial fisheries and displacement of activity on grounds targeted by the French.	The potential for loss of grounds and restricted access to fishing grounds and associated displacement has been given consideration within the assessment for all the fleets of concern, including the French fleet (Section 14.7).
Chapter 14 Commercial Fisheries	Prefecture Maritime Manche Mer du Nord	October 2017	It is likely that there will be an increase in marine traffic and interference with fishing activity and navigation. It would be useful to identify and quantify real impacts of displacement of fishing activity triggered by the increase in density of marine traffic in the area of the Norfolk Vanguard OWF.	The potential for loss of grounds and restricted access to fishing grounds and associated displacement has been given consideration within the assessment, for all fleets, including the French fleet (Section 14.7). Similarly, the potential for interference with fishing activity as a result of an increase in vessel transits has also been given consideration within the assessment (Section 14.7). Potential impacts of the project on shipping and navigation are described in detail in Chapter 15 Shipping and Navigation.
Chapter 14 Commercial Fisheries	Prefecture Maritime Manche Mer du Nord	October 2017	As a consequence, for consistency and coexistence purposes and given the information provided to the Prefecture Maritime and its attributions in terms of marine safety and marine planning, we are deeply interested in being kept informed of further consultation undertaken on this project	Consultation with French Maritime Authorities will be ongoing through-out all stages of the project.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO noted at [5th April 2017 consultation] meeting that we would like to see an approach to the impact assessment that it should consider that the assessment should explicitly assess the level of compatibility in the operation of fishing activities within the immediate footprint and vicinity of the project before going on assess wider impact significance taking account of available access to alternative fishing grounds	The potential for loss or restricted access to fishing grounds is recognised in the impact assessment for all the fleets of concern, including consideration on whether fishing may be able to resume within the operational wind farm (Section 14.7). The significance of potential impacts is assessed based on the sensitivity of the fleet and the magnitude of the effect in line with standard EIA procedures (Section 14.4). Considerations relating to the spatial scale of the impact form part of

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				the identification of impact magnitude levels (Section 14.7).
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO also noted that this is important when considering the east inshore and offshore marine plan policy aimed at maximising coexistence (policy GOV 2) so that mitigation is aimed directly at addressing this policy and mitigation responses are not just cast as a broader consideration according to the ability of vessels to access alternative grounds.	The East Inshore and East Offshore Marine Plans (DEFRA, 2014) have been reviewed in relation to this project. A number of embedded mitigation measures have been included as part of the project design to help minimise impacts on receptors, including commercial fisheries (Section 14.7.1.). In addition to these, where significant impacts have been identified, additional mitigation measures have been outlined (Section 14.7).
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Aside from being able to distinguish between issues related to coexistence and wider fisheries impact, the methodology assesses the spatial adaptability of fishing vessels (sensitivity) and proportion of landings derived from the footprint of the project (magnitude). These are invariably directly related to one another and are therefore not that insightful when presenting the results. A separation of analysis into direct compatibility of activity with the project followed by assessing the wider significance would be a more instructive approach for EIA and project planning purposes.	The potential for activity to resume within the OWF sites once operational is discussed in Section 14.7.5.7). The sensitivity of the receptor is based on its operational range, versatility of the method used and availability of grounds. The assessment of magnitude takes account of the level of activity of a given fleet in the area relevant to the project, in the context of the distribution of their overall activity. In addition it considers the extent of the area affected as well as the duration of the impact (Section 14.4).

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Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	No details or evidence is provided to substantiate the view that fishing vessels can fish within operational wind farms relative to worst case scenario – e.g. what type of fishing where and has it returned to similar levels that existed before the project.	There are examples of operational wind farms where fishing activities have resumed during the operational phase, including potting inside Barrow and Thanet and trawling inside Kentish Flats . Given concerns raised during consultation in respect of minimum spacing and the use of floating foundations both from the NFFO and Dutch consultees, a conservative approach has been taken to the assessment of loss or restricted access to fishing grounds during operation and it has been assumed that towed gear skippers may elect not to operate their gears within the OWF sites (Section14.7.5.2).
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO doubt that the conditions related to observations of fishing activities within wind farms will be comparable to the worst case scenario that is assessed here. Spacings of 616m between turbines represent a dense layout relative to the majority of windfarms that have been subject to planning application in the UK. Moreover, the worst case scenario includes provision for the deployment of floating wind structures with anchor cables that will present a sub-surface hazard to fishing activities. According to the Project Description Chapter (Ch 5) these could be angled at 30°. This would translate into cables spreading out to cover up to 65m (assuming anchor line of 20m). This would result in an overall theoretical distance of 468m to fish between. Assuming a 50m safety buffer is added to this then the total fishable space would be reduced to 368m. Under these circumstances we consider that it is extremely unlikely that any	Under the updated project design the worst case turbine spacing is 680m (9MW turbine option). Given concerns raised during consultation in respect of minimum spacing and the use of floating foundations both from the NFFO and Dutch consultees, a conservative approach has been taken to the assessment of loss or restricted access to fishing grounds during operation and it has been assumed that towed gear skippers may elect not to operate their gears within the OWF (Section14.7.5.2). It is also noted that for other recent offshore wind farm developments it has been agreed that fishing activity can continue within the site during operation.

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			forms of towed gear fishing activity would attempt to operate within the project array area.	
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	A fuller assessment could consider the manoeuvrability of fishing vessels with typical towed gears to consider this in a more comprehensive way, but as it stands we consider the inferred conclusions on fishing compatibility to be false and the assessment should be further elaborated to reflect the reality of the worst case scenario	Given concerns raised during consultation in respect of minimum spacing and the use of floating foundations both from the NFFO and Dutch consultees, a conservative approach has been taken to the assessment of loss or restricted access to fishing grounds during operation and it has been assumed that towed gear skippers may elect not to operate their gears within the OWF sites (Section 14.7.5.2).

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Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	<p>The commercial fisheries Chapter notes that an assessment of safety impact is not best considered via an environmental assessment approach, but should be assessed according to safety risk (Ch 14, para 196, p55). We agree with that view.</p> <p>However, the fisheries assessment considers that risks would only present themselves in incidences of infringements to safety zones (para 199, p56). This is incorrect as it does not recognise the risk of snagging on cables, dropped objects or cable protection.</p> <p>Chapter 14 refers to the navigational impact assessment in chapter 15, but as chapter 15 indicates, the assessment only considers navigational impacts (i.e. fishing vessels in transit), not those specifically related to fishing such as reduced manoeuvrability and gear snagging risks. Ch 15, para 182 states "that certain foundation types will have an impact on levels of active fishing due to the snagging risk associated with mooring lines. This is considered further within Chapter 14 Commercial Fisheries." This risk, nor risks to snagging on cables or dropped objects is assessed in either Chapter 14 or 15. We consider that these risks should be assessed accordingly taking account of the manoeuvrability of vessels when fishing and the relative position of deployed gears.</p>	The assessment of safety risks for fishing vessels provided in this chapter (Section 14.7.4 and Section 14.7.5) and takes account of risks to vessels associated with snagging, dropped objects and issues associated with cable protection, as well as manoeuvrability issues.

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Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	We note that not all MPAs and MPA proposals have been considered in the commercial fisheries assessment.	Proposals for fishing restrictions within local SACs have been noted, however, it is understood that these are a current recommendation proposed for adoption and have yet to be finalised or implemented. MPA/SACs considered in the cumulative assessment can be found in Table 14.29.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	It is not clear, or perhaps we have not seen what provisions are expected for potential exposures to cables and related remediation works. These do not appear to be factored into a worst case scenario, but in our view are a significant risk. Nor does there appear to be contingency planning proposed for such occurrences. The Galloper windfarm, for instance, has recently identified 8 such occurrences along its export cable.	Galloper is still in construction and any non-buried sections of the cables have been rectified by the contractor prior to sign off. Consideration has been given in the assessment of safety risks for fishing vessels during the operational phase to potential risks associated with exposed cables. (Section 14.7.4 and Section 14.7.5). As described in Section 14.7.1, once cables are installed into the seabed, post-lay and burial inspection surveys will be undertaken.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Ray form an important local stock to the fishing industry. Spurdog are also found in local concentrations and with their recovery are expected to form an important future fishery as it once was in the past. Monitoring studies on existing windfarms have been based upon AC technology and as the fisheries ecology chapter (CH 11) identifies, the magnitude of the magnetic field strength for a DC export cable is significantly higher than that for AC export cable (10x at 0 distance from the cable). The evidence provided does not provide any degree of certainty that the overall impact will be minor. This places greater emphasis on achieving and maintaining sufficient cable burial depth and in undertaking appropriate monitoring to establish whether or not significant adverse effects are taking place.	A detailed assessment of the potential impacts of EMFs on sensitive species, including elasmobranchs is given in Chapter 11 Fish and Shellfish Ecology and takes account of the use of both AC (array) and DC cables (export cables).
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017		
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Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The commercial fisheries chapter details some measures that would assist in mitigating fisheries impacts – e.g. cable burial to 3m (1m is referred to in the fish ecology chapter Ch 11 – this should be clarified), NTMs, appointment of fisheries liaison officer. We do not consider that actions by the fishing fleet to adapt to the proposal represent mitigation as detailed in the Commercial fisheries Chapter. We note that safety zones under the Electricity Act 2004 are not permissible for cables outside of safety zones defined renewable energy installations.	As outlined in Section 14.7.1, cables will be buried where possible to at least a depth of 1m and protected where cable burial is not feasible. The description of safety zones now includes the term “advisory” to address this point .
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	For OWF array and export cables the NFFO would like to apply adherence to FLOWW best practice guidelines.	Vattenfall Wind Power Ltd (the parent company of Norfolk Vanguard Limited) are part of the FLOWW Committee and would therefore consider adherence to these guidelines as standard.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Consult with fisheries stakeholders on the production of cable burial plans/ cable burial risk assessment and monitoring plans.	Ongoing consultation with fisheries stakeholders will be undertaken, including sharing of project specific information as it becomes available (Section 14.7.).
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Where significant risk is identified with bottom towed fishing gears and cables consider this in proposing any protection and contingency remedial works.	Noted.

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Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Use of post installation trawl surveys to verify clear seabed.	<p>Post-lay and burial inspection surveys will be undertaken after the cables are installed into the seabed as outlined in Section 14.7.1 to assess the seabed status.</p> <p>In the event that sea bed rectification procedures are required, and where feasible, the appropriate measures would be undertaken. Detail describing operations and maintenance of export cables is provided in Chapter 5 Project Description. In the event that cables become unburied during the operational phase it is anticipated that this would be resolved through the methods described and communicated to the fishing industry through the use of a dedicated FLO and appropriate channels such as KISORCA and Kingfisher. Further detail is expected to be captured at a later stage within the FLP. In light of the above it is not anticipated that post - installation trawl surveys would be necessary.</p>
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Communicate the results of post installation surveys to fisheries stakeholders.	Ongoing consultation with fisheries stakeholders will be undertaken, including sharing of project specific information as it becomes available (Section 14.7).
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Use of Kingfisher to provide hazard information and alert of emergent hazards (in addition to works and cable crossings and cable protection) e.g. risk of de-burial of cables and cable exposures.	Noted. See section 14.7.1.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	Protect emergent hazards such as exposed cables through appropriate means (e.g. guard vessel deployment) prior to remediation works being completed.	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO takes the view that there should be no in-situ seabed hazards left in place following decommissioning and any infrastructure that remains buried in the seabed following an adequate assessment of the options should be subject to an ongoing monitoring regime with retained liability to address any emergent hazards.	The draft DCO requires that a decommissioning programme for the offshore works in compliance with any notice served under section 105(2) of the Energy Act 2004 is submitted for approval by the Secretary of State prior to commencement of the offshore works.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	<p>Preparation of a fisheries liaison and coexistence plan prepared in consultation with fisheries stakeholders that may detail provisions identified above as well as other operational management arrangements such as provisions for gear clearance and disruption settlements, navigation corridors and protocols, gear snagging protocols and processes for attributable claims, and retrieval of displaced static gears from safety zones.</p> <p>The NFFO suggests this is prepared at an early stage so that certainty and assurance can be provided to fishing communities and workable approaches to resolving issues can be established. It is expected, however, that it will form a working document that is periodically updated to reflect changing circumstances or the emergence of issues that have not been previously accounted for.</p>	<p>A FLP will be produced for the project post-consent in consultation with stakeholders.</p> <p>Where there has been demonstrable impact on individual vessels any agreements will be based on evidence and track record – in accordance with FLOWW guidance</p>
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO encourage the use of funding arrangements like the West of Morecombe Fisheries Fund as a mechanism to support fishing industry stakeholders affected by the project and provisioning of work opportunities (e.g. guard vessels or surveys for example) available to	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			affected fisheries stakeholders as far as practically possible.	
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO encourage that support is made to fund the adoption of the Fish Safe device by fishing vessels operating in the area – see http://www.fishsafe.eu/en/fishsafe-unit.aspx . This technology, which combined with other safety elements above, provides automated means of integrating safety information into the navigational systems on fishing vessels that in turn provide a real-time warning of safety hazards in the wheel house. This will greatly promote safe working regime around the vicinity of the project and minimise the likelihood of incidents occurring in an area where there exists high levels of fishing activity.	Noted.
Chapter 14 Commercial Fisheries	National Federation of Fishermen's Organisations	October 2017	The NFFO encourage the development of a windfarm industry wide scheme to assess and address non-attributable claims for gear damages or losses.	Noted. Norfolk Vanguard will implement evidence based gear loss claim process in line with FLOWW guidelines
Chapter 14 Commercial Fisheries	Paul Lines (fisherman)	October 2017	Mr Lines is concerned about the cables impacting elasmobranchs	The potential impact of EMFs associated with the project on sensitive fish species, including elasmobranchs, has been assessed in detail in Chapter 11 Fish and Shellfish Ecology. Significant impacts in this respect have not been identified (impacts assessed as of minor adverse significance for elasmobranchs).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Paul Lines (fisherman)	October 2017	Mr Lines has asked that socio-economic aspects are explored from any potential damage to benthic community and biodiversity	The potential impacts of the project on benthic habitats are assessed in Chapter 10 Benthic and Intertidal Ecology. The assessment carried out did not identify significant impacts (i.e. above minor adverse significance) on benthic communities.
Chapter 14 Commercial Fisheries	Paul Lines (fisherman)	October 2017	Mr Lines has requested that "a system is put in place where fishermen can converse to the developer without having to speak to [an] appointed liaison [officer] who is financed by the developer"	Consultation with the fishing industry will be ongoing. As outlined in Section 14.7.1, an FLO will be appointed during the construction and operation phase of the project and FLOWW guidance in respect of fisheries liaison adhered to.
Chapter 14 Commercial Fisheries	Paul Lines (fisherman)	October 2017	Mr Lines has requested "all vessel carry a fisherman as liaison [that] is local to the area"	Consultation with the fishing industry will be ongoing. In line with FLOWW guidance an FLO will be appointed. Where appropriate, suitably experienced Offshore Fisheries Liaison Officers (OFLOs) may also be used
Chapter 14 Commercial Fisheries	Paul Lines (fisherman)	October 2017	Mr Lines has asked that a clear transit route is established to and from all area of operations and is communicated daily	Detailed transit routes are at this stage unknown. These will be defined post-consent in line with standard practice.
Chapter 14 Commercial Fisheries	Paul Lines (fisherman)	October 2017	An understanding of cost of gear is established before commencement of work	Norfolk Vanguard will implement an evidence based gear loss claim process in line with FLOWW guidelines. A gear loss protocol will be included within the Fisheries Liaison and Coexistence Plan .
Chapter 14 Commercial Fisheries	Natural England	October 2017	Natural England do not necessarily agree that only impacts assessed as significant resulting from the construction and operation will have the potential to contribute to cumulative effects. A range of smaller impacts over a long period of time could eventually become a significant impact.	All the potential impacts on commercial fisheries assessed for the project alone have been taken account of in the cumulative assessment (Section 14.8). Exceptions to this are safety issues and risks associated with seabed obstacles as it is understood that the same obligations will apply to other projects and therefore there is no potential pathway for a cumulative impact.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Natural England	October 2017	Further explanation needs to be provided as to why quantitative assessment cannot be undertaken .	Surveillance sightings data provide a qualitative indication of the distribution of fishing activity by method and nationality and do not provide information on the intensity of fishing (i.e. level of effort or value) to allow a quantitative assessment.
Chapter 14 Commercial Fisheries	Natural England	October 2017	We question the last sentence of this point stating that the electric pulse is mild and that minimum disturbance occurs. Evidence presented in peer reviewed literature has shown that large gadoid fishes which come close to pulse trawls can suffer from haemorrhages and muscular contractions which cause breakages of the spine. Furthermore, any organism that comes into contact with the trawl is effectively electrocuted, this cannot be described as minimum disturbance.	Noted. This has been amended in the text.
Chapter 14 Commercial Fisheries	Natural England	October 2017	Agree with the proposal to bury the cables – not only does it reduce the risk to fishermen but also reduces the effects of EMF upon sensitive fish species. However, additional cable (rock) protection should only be a last resort where burial is not possible. It would pose a risk to trawling fishing vessels and also could have negative environmental effects – especially in soft sediment dominated area.	As previously mentioned Norfolk Vanguard Limited are committed to bury the cables where feasible , therefore reducing the need for cable protection. Potential safety issues for fishing vessels associated with cable protection have been taken account of in this chapter and are assessed in Section 14.7.5.5. Potential impacts associated with EMFs on sensitive fish species are considered within Chapter 11 Fish and Shellfish Ecology.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Natural England	October 2017	<p>Looking at the evidence presented within this chapter, the proposed offshore site for Vanguard is located in some key areas for Dutch trawlers. This is particularly true in parts of NV west and the offshore cable corridor, where fishing intensity is high and worth a lot of money. Although displacement impacts have been categorised as negligible / minor significance from an environmental point of view it could potentially be worse. The transferral of this fishing effort into other areas may potentially expose protected species and sites to additional pressure. This is particularly true if fisherman are displaced from areas that are the most efficient to fish, they may have to fish more intensively to maintain catch rates or profitability against increased costs such as fuel. Fishermen as a result may take more risks and flout previously agreed management practices to maximise these returns. Overall, despite the wind farm potentially acting as a de facto MPA and reducing fishing pressure in the project area it could have the opposite effect and increase intensity in other areas. This needs to be assessed further despite only a small area, yet a productive one, being potentially lost.</p>	<p>The Dutch fleet has a wide operational range and availability of equally productive grounds in the context of the area occupied by the OWF sites. In addition, a voluntary agreement is currently in place to avoid fishing in certain areas off the east coast of England. This includes a section of NV West. On this basis significant impacts on this fleet have not been identified in respect of loss or restricted access to fishing grounds and potential for associated displacement. Assessments of the potential impact of the project on benthic ecology and on fish and shellfish ecology are provided in Chapter 10 Benthic and Intertidal Ecology and Chapter 11 Fish and Shellfish Ecology, respectively.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Natural England	October 2017	The Commercial Fisheries technical report provides a good overview of the commercial fisheries occurring around the project boundaries. The majority of UK fishermen are concentrated around the inshore areas, mainly using static gear such as pots and creels, targeting shellfish species. Further offshore, foreign vessels, mainly Dutch, French and Belgium trawlers, target benthic and demersal species such as Plaice, Sole and Cod. This offshore fishery represents quite a large operation. The proposed offshore area for the windfarm represents a heavily fished area, which when construction and operation is occurring may displace fishermen to other areas that are not as regularly fished – see comments above. The UK fishermen that utilise static gear may suffer some disturbance from inshore works. However we do not believe that it would be significant.	Noted.
Chapter 14 Commercial Fisheries	Andy Williamson	October 2017	Being a local fisherman from sea Palling Andy works static gear (crab and lobster pots) through the proposed cable routes which is going to "destroy" his livelihood so at this present time Andy is not happy with the project.	Consultation has been undertaken with Mr Williamson (Table 14.4) and his grounds have been identified and used to inform this chapter.
Chapter 14 Commercial Fisheries	Charles Lines	October 2017	Charles fishes with his father in the area of the cables. He is concerned the disturbance generated by "digging up" the seabed will greatly affect my livelihood. Charles asks for assurance that the cables won't "come to destroy the crabs, lobsters and whelks" before buying a new fishing vessel.	The potential disturbance to fish and shellfish species associated with construction of the project, including that associated with cable installation activities, are addressed in Chapter 11 Fish and Shellfish Ecology. It should be noted that the assessment carried out did not identify any impacts exceeding minor adverse significance in this respect.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 14 Commercial Fisheries	Steve Wightman	October 2017	Writing on behalf of the fishing business, based in Lowestoft - Steve fishes in the area of the proposed wind farm and cable route throughout the year. Steve has "grave concerns" about the future viability of fishing this area post construction of Vanguard because of the proximity of the turbines. Steve uses long lining and netting, which "takes up a lot of sea area". During operations fishing between the turbines will be hazardous and restrictive. Steve has requested to be fully involved in discussions on layout and arrangement of the turbines to find the best solution to these concerns. Steve mentioned a feasibility fishing survey within the East Anglia One windfarm site, "the outcome of which will have bearing on Vanguard and other windfarms".	Whilst the majority of activity by the local static gear fleet occurs within the 12nm limit and therefore in areas relevant to the offshore cable corridor, consideration has also been given to the activity in the OWF by some local vessels (Section 14.7.5.2.3). The limitations of different fishing methods, including long lining and netting in terms of their potential to resume activity in the OWF sites have also been given consideration in the impact assessment (Section 14.7.5.2).

Feedback related to Shipping and Navigation (Chapter 15 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 15 Shipping and Navigation	RYA	15th November 2017	The most up to date RYA position on offshore renewable wind energy developments (paper 1 of 4) is dated September 2015” Otherwise the PEIR reflects the RYA concerns and observations arising from our discussions on 8 May 2017.	Section 15.2 (Legislation and Guidance) references the most up to date RYA guidance as required.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 15 Shipping and Navigation	CA	7th December 2017	We note that between 90 and 257 turbines are proposed. Each will be an obstruction to navigation and potential danger to small vessels so we therefore urge selection of the largest generators possible giving the fewest obstructions. From the point of view of navigation safety all should be located within Norfolk Vanguard East rather than Norfolk Vanguard West area as suggested so that when considered in combination with the proposed Boreas site a smaller east-west obstruction is presented.	Allision and collision modelling has been undertaken assuming the worst case parameters from a shipping and navigation perspective (maximum number of structures). Noted that following PEIR, the maximum number of wind turbines has been reduced to 200. The final layout will be agreed with the MCA post consent.
Chapter 15 Shipping and Navigation	CA	7th December 2017	We note that proposed spacing between turbines will be a minimum of 616m. This is just adequate but our experience is that spacing of 1,000m or greater is required for problem free navigation of small craft and urge selection of generator size large enough to require this.	Following PEIR, the worst case (minimum) turbine spacing has been increased to 680m. The final layout will be agreed with the MCA post consent.
Chapter 15 Shipping and Navigation	CA	7th December 2017	We have no views on the type of foundations proposed except to ensure a minimum navigable depth at all times of at least 3m round the visible part of the towers even if a Safety Zone of 50m is provided round each tower.	Navigable depth will maintained in line with MCA guidance. See embedded mitigations 15.7.1.
Chapter 15 Shipping and Navigation	CA	7th December 2017	Our layout preference is strongly towards turbine patterns in straight rows and lines in order to preserve the essential 'see-through' characteristic required for easiest navigation through from all directions and to assist SAR operations. We are pleased therefore to note that you will adopt at least a single line of orientation and to note that all ancillary structures (accommodation platforms, electrical stations, etc) will be in line with rows and lines to preserve sightlines through the tower	The final layout will be considered in line with MGN 543 and a safety case will be submitted as required to demonstrate that it is within As Low As reasonably Practicable Parameters.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			field. We strongly support straight edges with no isolated structures.	
Chapter 15 Shipping and Navigation	CA	7th December 2017	Whichever port is finally chosen it is likely that the Vanguard projects, and Boreas to come, will generate high traffic between it and the offshore sites and that much of this will be specialised construction or support vessels and vessels Restricted in their ability to Manoeuvre (RAM). While the Collision Regulations can deal with most situations our experience is that heavy work traffic can greatly increase the risks to small vessels particularly in or near harbour exits. Consideration should therefore be given to defined and publicised routing of working vessels which can become known in advance.	Promulgation of information will be undertaken, as per Section 15.7.1 (Embedded Mitigation). The RYA request a minimum of 4m under keel clearance and the Norfolk Vanguard OWF sites are expected to achieve this
Chapter 15 Shipping and Navigation	CA	7th December 2017	We can confirm the recreational craft routing given in the PEIR but have cause to doubt the low frequency of yachts recorded. While we cannot offer survey data we suggest that an average of 10-30 yachts per day may be expected to cross the corridor at maximum in the summer season. Our doubt concerning the number of yachts captured in the surveys does not affect the overall assessment.	Marine traffic analysis within the Offshore Cable Corridor was AIS only. Given that the RYA Coastal Atlas (RYA, 2016) has also been considered, the available data is considered to provide a good indication of the levels and locations of recreational activity.
Chapter 15 Shipping and Navigation	TH	8th December 2017	At this stage Trinity House would like to advise that the layout of Norfolk Vanguard East must align with adjoining wind farm projects, such as East Anglia Three. Therefore, continuous dialogue	Continuous dialogue is ongoing with the developers of East Anglia Three.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			with such projects is imperative throughout the consenting process of Norfolk Vanguard.	
Chapter 15 Shipping and Navigation	MCA	11th December 2017	We note that the development area carries a significant amount of through traffic, and attention needs to be paid to routeing, particularly in heavy weather ensuring shipping can continue to make safe passage without significant large scale deviations.”	Vessel routeing is assessed in Sections 18 (base case) and 19 (future case) of the NRA (Appendix 15.1), with associated impacts assessed in this chapter in Section 15.7. Adverse weather is discussed in Section 16 of the NRA (Appendix 15.1), with associated impacts assessed in this chapter in Section 15.7.
Chapter 15 Shipping and Navigation	MCA	11th December 2017	The possible cumulative and in combination effects on shipping routes should be considered taking into account the proximity to other windfarm developments; Norfolk Vanguard East, Norfolk Vanguard West, Norfolk Boreas, the alignment with East Anglia Three and other operations throughout the Southern North Sea.	An assessment of likely cumulative routeing is presented in Section 19.3 of the NRA (Appendix 15.1), which takes the wind farms mentioned within the MCA response into account. Collision has been assessed on a cumulative basis in Section 22 of the NRA (Appendix 15.1). Associated impacts are assessed in this chapter in Section 15.7.
Chapter 15 Shipping and Navigation	MCA	11th December 2017	MGN 543 Annex 2 Paragraph 6 requires that hydrographic surveys should fulfil the requirements of the International Hydrographic Organisation (IHO) Order 1a standard, with the final data supplied as a digital full density data set, and survey report to the MCA Hydrography Manager. This information will need to be submitted, ideally at the EIA Report stage.	As per Entry (6) of the MGN543 Checklist (Appendix B), the Applicant will supply hydrographic data compliant with MGN543 requirements.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 15 Shipping and Navigation	MCA	11th December 2017	Export cable routes, cable burial protection index and cable protections are issues that are yet to be fully developed. However due cognisance needs to address cable burial and protection, particularly close to shore where impacts on navigable water depth may become significant. Any consented cable protection works must ensure existing and future safe navigation is not compromised. The MCA would accept a maximum of 5% reduction in surrounding depth referenced to Chart Datum. Existing charted anchorage areas should be avoided. Where burial depths are not achieved consultation will need to take place with MCA regarding the locations, impact and potential risk mitigation measures.	As per the embedded mitigation listed in Section 15.7.1, a Cable Burial Risk Assessment will be undertaken post consent, which will present in detail the intended cable protection to be implemented. The approach taken for cable sections where protection may reduce water depths by more than 5% will be agreed with the MCA.
Chapter 15 Shipping and Navigation	MCA	11th December 2017	The turbine layout design will require MCA approval prior to construction to minimise the risks to surface vessels, including rescue boats, and Search and Rescue aircraft operating within the site. As such, MCA will seek to ensure all structures are aligned in straight rows and columns, including any platforms. Any additional navigation safety and/or Search and Rescue requirements, as per MGN 543 Annex 5, will be agreed at the approval stage. The layout design should take into account East Anglia 3 and should align, ideally with information sharing agreements in place with the associated developers.	The final layout will be agreed with the MCA post consent.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 15 Shipping and Navigation	MCA	11th December 2017	Safety zones during the construction, maintenance and decommissioning phases are supported, however it should be noted that operational safety zones may have a maximum 50m radius from the individual turbines. A detailed justification would be required for a 50m operational safety zone, with significant evidence from the construction phase in addition to the baseline NRA required supporting the case.	As per the embedded mitigation listed in Section 15.7.1, standard safety zones will be applied for during construction, major maintenance, and decommissioning. There is the potential for the safety zone application to include provision for operational safety zones around permanently manned accommodation platforms to protect the personnel onboard. Further consultation will be undertaken prior to submission of the safety zone application.
Chapter 15 Shipping and Navigation	MCA	11th December 2017	An Emergency Response Cooperation Plan is required to meet the requirements of MCA guidance. The template is available on the MCA website at www.gov.uk . An approved ERCOP will need to be in place prior to construction. The ERCOP is an active operational document and must remain current at all stages of the project including during construction, operations & maintenance and decommissioning. A SAR checklist will be discussed post consent to track all requirements detailed in MGN 543 Annex 5. The checklist will be adapted to suit Norfolk Vanguard.	As per the embedded mitigation listed in Section 15.7.1, an ERCOP will be produced post consent using the MCA template. The new MCA SAR checklist will be discussed with the MCA post consent.
Chapter 15 Shipping and Navigation	MCA	11th December 2017	The boundary turbines, where they are more than 900m apart, must be lit with a single 2000 candela, red aviation light, flashing Morse 'W' in unison with all other boundary turbines. All other turbines must be fitted with a fixed single red 200 candela aviation light, visible through 360°, for SAR purposes. Further consultation with the CAA and MCA should be sought by the applicant where additional mitigation may be identified. We would expect consistency with lighting across East Anglia 3, Norfolk Vanguard East and West and Norfolk Boreas.	Lighting and marking of Norfolk Vanguard will be agreed with TH, MCA, Ministry of Defence (MOD) and the CAA, and will be in line with IALA-O139.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 15 Shipping and Navigation	Rijkswaterstaat	11th December 2017	I am happy to note that you comply with the arrangements for East Anglia as commented by Rijkswaterstaat (distance between shipping route and wind park) with reference in Appendix 15.1 section 17.3.2 to the IMO advice.	The assessment referenced is available in Section 17.3.2 of the NRA (Appendix 15.1). A meeting was offered with Rijkswaterstaat which they declined.

Feedback related to Aviation and Radar (Chapter 16 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 16 Aviation and Radar	MOD	December 2017	<p>The MoD (DIO) responded to Section 42 statutory consultation stating that the Norfolk Vanguard PEIR had taken account of the extent of maritime military PEXAs as well as the use of airspace in the vicinity of the proposed development for defence purposes. MoD (DIO) made the following observations:</p> <ul style="list-style-type: none"> • Military low flying may be conducted over the sea beyond the mapped area of the UK Low flying system; the MoD may request that structures such as platforms are fitted with aviation warning lighting where there is no mandatory requirement for installation. • The MoD stated that it should not be assumed that a Non Automatic Initiation Zone (NAIZ) mitigation solution will be technically or operationally acceptable to mitigate the impact to the Trimmingham ADR; the MoD would welcome a mitigation proposal that addresses the impact on the Trimmingham ADR. 	Section 6 and 79.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<ul style="list-style-type: none"> • With regard to the onshore cable route, the MoD provided defined heights of safeguarded zones encompassing the Trimmingham ADR and RAF Marham airfield, to which the MoD require consultation upon development exceeding the defined heights. 	
Chapter 16 Aviation and Radar	MCA	June to October 2017	<p>The MCA were contacted with details of Norfolk Vanguard for comment. No direct reply was received; however, a reply to a request for formal statutory consultation was received during October 2017 which focussed on shipping and navigation elements of the PEIR.</p> <p>The following comments were included with regard to aviation.</p> <ul style="list-style-type: none"> • Layout Design: The turbine layout design will require MCA approval prior to construction to minimise the risk to SAR aircraft operating within the Offshore Wind Farm (OWF) sites. • Lighting: MCA state that 'the boundary turbines, where they are more than 900 m apart, must be lit with a single 2000 candela, red aviation light, flashing Morse 'W' in unison with all other boundary turbines. All other turbines must be 	Section 16.7.2. Shipping and Navigation is covered in Chapter 15.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			fitted with a fixed single red 200 candela aviation light, visible through 360°, for SAR purposes.	

Feedback related to Offshore and Intertidal Archaeology and Cultural Heritage (Chapter 17 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	In 5.3 (paragraph 20) of the PEIR it is stated that the landfall location of the cable route will be at Happisburgh. It is important to note that internationally significant archaeology has been found in this area dating to c.800,000yrs -1 million years ago, representing the earliest evidence for hominids in the UK. There is the potential for deposits/remains associated with the Cromer Forest Bed Formation (CF-bF) to be disturbed and/or damaged by the process of bringing the cables onshore. If significant features/remains are identified then we would expect to see a suitable mitigation strategy established in the WSI.	Due to the presence of deep deposits of glacial origin at the landfall the potential for significant features to be present is anticipated to be low. The Outline WSI (DCO Document 8.6) includes provision for further geoarchaeological assessment and deposit modelling to clarify any requirement for further mitigation.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	It is stated (paragraph 21 of the PEIR) that the development is considering the use of either HVDC or HVAC cables. The impacts of both options on the historic environment will need to be discussed.	Following PEIR, only the HVDC option is now being taken forward in the final design for the project.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	It is stated that under cliff drilling will be carried out using HDD drilling. It should be noted that there is the potential for the bentonite slurry used in the HDD process to breakout and spread into/coast archaeological deposits, features and materials. Information would need to be provided regarding the chemistry, pH and composition of the drilling fluid used. The impact that these approaches would have on the archaeology would also need to be considered, particularly where the drill will pass under significant and in-situ archaeological remains.	The potential impact of drilling fluid breakout associated with Horizontal Directional Drilling (HDD) is discussed in section 17.7.5.5.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	The impact that the various foundation types that are being considered may have on the buried or near-surface archaeology needs to be considered and mitigated against. Likewise scour protection may be required for the different foundation options, which would also have the potential to affect, through erosion or construction, any sea bed deposits in the adjacent areas. This in turn may result in archaeological deposits or features becoming exposed or buried.	<p>The potential impacts of the foundation types and associated scour protection are assessed through the worst case scenarios and discussed in sections 17.7.5, 17.7.5.5 and 17.7.7.</p> <p>The Outline WSI (DCO Document 8.6) includes details of potential mitigation options if significant impacts are identified.</p>
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	The foundation type and construction method of the offshore electrical platforms has not yet been finalised, and so a number of options are presented (see Section 5.4.4.1.1 of the PEIR). Information is therefore required regarding the potential impact that any anchorage of vessels or	The potential impact from the anchorage of vessels or foundations are discussed in sections 17.7.5, 17.7.5.5 and 17.7.7.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			foundations would have on any buried or near-surface archaeology.	
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	The heat lost per meter of HVAC cable is an important aspect to consider in terms of the historic environment, as heat may have a damaging effect on any waterlogged archaeological remains that may be present, such as palaeoenvironmental remains and waterlogged wood. Similar comments apply for HVDC cables	The potential for heat loss to impact any waterlogged archaeological remains is discussed in section 17.7.6.5.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	We note the discussion of the export cable installation, array cable installation and burial, the pre-lay grapnel run, dredging of sand waves prior to installation, ploughing, trenching/cutting or jetting to bury cables at target depths of between 1m and 3m. All these methods will need to be discussed in terms of their impact on any buried or near-surface archaeology, and suitable mitigation strategies developed. Similar analysis and strategies will be needed for the areas where it is not possible to bury the cables, and where cable protection is needed.	The potential impact from cable installation and seabed preparation is discussed in section 17.7.5. The Outline WSI (DCO Document 8.6) includes details of potential mitigation options if significant impacts are identified.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	If significant features/remains are identified then we would expect to see a suitable mitigation strategy established in the WSI. The scientific dating of these deposits needs to be considered carefully as the techniques that can be applied to deposits of this age often require specific collection, storage and processing approaches to be used, such as OSL, Amino Acid Racemisation,	Geoarchaeological assessment, including dating, has been undertaken by Wessex Archaeology. The details are presented in Appendix 17.2, 17.3 and 17.4 and summarised in section 17.6.1. The Outline WSI (DCO Document 8.6) includes provision for further geoarchaeological assessment, including the involvement of specialists, to be undertaken post-consent.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			and biostratigraphy, and therefore would require the involvement of specialists.	
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	Under paragraph 17.1 in the PEIR it would be useful to include the Coastal and Intertidal Zone. Archaeology Network (CITiZAN) project database of archaeological find spots created as part of this project. The database/GIS layer is updated regularly by project members and volunteers, providing an opportunity to take advantage of recently collected information.	Data from the CITiZAN project has been added as a data source in section 17.5.2 and reviewed to inform the updated baseline for Intertidal Archaeology in section 17.6.3.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	The automatic assumptions made in the PEIR are to focus on negative impacts, when we suggest that attention could also be given to highlighting the magnitude of any positive effects. For example, the commissioning of geophysical and geotechnical surveys before any works commence, should consent be obtained, to discuss with us the survey strategy to be employed, so that data generated are sufficiently robust to enable professional archaeological interpretation and analysis. In doing so it should be possible to demonstrate a positive effect and public benefit through actively contributing new data and information about our shared historic environment.	Additional detail on potential positive impacts of the project have been added to the impact assessment methodology and detailed in section 17.4.1.
Chapter 17 Offshore and Intertidal	Historic England	11th December 2017	Table 17.6 of the PEIR requires more explanation regarding “beneficial magnitude” especially in reference to the explanation provided by Table	Additional detail on positive impacts added to the impact assessment methodology in section 17.4.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Archaeology and Cultural Heritage			17.7 which appears to be focussed on negative effects.	
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	17.6.2 (paragraph 68) of the PEIR summarises the geophysical techniques that have been utilised to identify a number of archaeological features (Side Scan Sonar, Magnetometry, and Multibeam Bathymetry), but the percentage coverage and resolution of the surveys are not stated here. It would have been useful to present a summary of the data quality here so it is clear how much weight can be placed on the conclusions drawn from the data.	This detail has been summarised from Appendix 17.1 in Table 17.8.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	A fundamental principle must be that survey commissioning, interpretation and report are programmed, so that the eventual engineering design selected for delivery of this project, should consent be obtained, is fully informed and guided by archaeological advice.	The necessary programme for archaeological assessment, fully informed and guided by archaeological advice, is detailed in the Outline WSI (DCO Document 8.6).
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	Section 17.6.3 (Intertidal archaeology) of the PEIR; we note the acknowledgement in paragraph 87 regarding the potential to encounter prehistoric material within the intertidal zone and paragraph 89 states that there is high potential for further Palaeolithic remains to be found where the CF-bF is found in situ. We would support this statement and encourage that this formation is thoroughly investigated in order to mitigate any loss or damage to any potentially significant remains that may be present. The mitigation strategy would need to be integrated into the geotechnical specification and archaeology programme, as well as being specified in a WSI. The results of the	The results of a programme of geoarchaeological assessment undertaken by Wessex Archaeology (Chapter 28) and the specific archaeological interest of Happisburgh is summarised in section 17.6.3. This indicates reduced potential compared to that considered in the PEIR.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			ground investigations conducted with archaeological supervision would need to be included within the Environmental Statement (ES).	
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	Section 17.7.2 (embedded mitigation) of the PEIR summarises the embedded mitigation that will be employed to minimise the risk to the historic environment, including the implementation of Archaeological Exclusion Zones (AEZs), the further investigation of A2 anomalies, geo-archaeological coring of features, watching briefs etc. (paragraph 104). In general, we agree with the matters outlined in this section and the measures to be identified within any Deemed Marine Licence. Additional detail will be required in terms of how each of the strategies will be carried out and this should be compiled into a WSI in support of these mitigation strategies.	The Outline WSI (DCO Document 8.6) captures the detail of the proposed embedded mitigation.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	Section 17.7.3 (worst case) of the PEIR, we require clarification regarding the statement made in paragraph 110 and whether or not the EIA exercise will assess how sediment accumulation might provide in-situ protection.	The positive impact of sediment accumulation upon archaeological remains is discussed in sections 17.7.5.3, 17.7.6.3 and 17.7.7.3.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	It is stated in Section 17.7.5.1 of the PEIR that AEZs will not be implemented for A2 or A3 anomalies, but will be largely avoided by micro-siting. It is further stated that high resolution geophysics will be carried out pre-construction, mainly for UXO identification, which will further clarify and refine the nature and extent of some of the anomalies. This working team should include a marine geophysicist with archaeological experience so that the collected data is of use for both UXO identification and archaeology. We also note that many UXO have archaeological interest.	The Outline WSI (DCO Document 8.6) includes provision for specialist input from a marine geophysicist with archaeological experience in planning pre-construction surveys.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	Under Section 17.7.5 (potential impacts during construction) of the PEIR, the recommendations for Archaeological Exclusion Zones (AEZs) stated in paragraph 119 are welcomed and it is important that the WSI includes all these AEZs. However, the proposed action is confusion with specific reference to what are described as "...magnetic only A1 anomalies": 70058; 70615; 71297; 71299; 71314; 71323; 71325; and 71479, which have not been afforded AEZs for the stated reason that "...it is not possible to say with certainty that they are of archaeological interest." We must take issue with this statement as the entire purpose of an AEZ is precautionary and the fact that these anomalies have been afforded A1 status therefore leads to the conclusion that they should be afforded spatially defined AEZs. We add also that through adopting such defined AEZs it should be possible to determine an appropriate strategy for any micro-siting. Furthermore the detail in Table 17.17 (Recommended AEZs)	AEZs have been added to the embedded mitigation for magnetic only A1 anomalies (section 17.7.5.1)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			provides clarity regarding proposed spatial extents for AEZs (e.g. 50 metre) and we recommend that the same principles should be applied to all A1 anomalies.	
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	Paragraphs 121 and 122 in the PEIR outline proposals for anomalies classed as A2 and A3 and we acknowledge the proposed approach for handling these anomalies and we add that specific reference should be made to the role the archaeological WSI provides in setting out methodological approaches to subsequent investigations either employing geophysical, direct visual inspection techniques including intertidal walkover survey. We also hereby welcome the statement made in paragraph 130 regarding the preparation of Protocol for Archaeological Discoveries: Offshore Renewables Projects, in line with guidance published by The Crown Estate and we hope a draft version will accompany the ES.	The proposed methodological approaches for handling A2 and A3 anomalies and a draft Protocol for Archaeological Discoveries are set out in the Outline WSI (Document 8.6) and will be confirmed through the final Offshore WSI (required under condition [14(1)(j)] of the DMLs).
Chapter 17 Offshore and Intertidal	Historic England	11th December 2017	However, we take issue with the statements made in paragraph 132 such as "...potential to recover from the effect of this removal", we consider it more a matter where effective	Noted and taken into account in updated impact assessment presented in section 17.7.5.2.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Archaeology and Cultural Heritage			completion of long-term conservation measures should allow archaeological materials to be stabilised. Therefore, it is not immediately apparent that impact significance can be considered as “minor”.	
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	We also do not agree with the claim made in paragraph 135 that if HDD exits below the low water mark that impact within the intertidal zone will have “negligible magnitude of effect” given that depth of HDD may still impact in-situ sedimentary sequences contained within the intertidal zone. The matters addressed in paragraph 136 are of major importance as relevant to the appropriate action to be taken by all parties identified with this proposed project. We appreciate that mitigation measures are identifiable that could address the significance of any likely impact, but we reserve any further comment until effective mitigation measures are produced in consultation with us and local curators as required should consent be obtained. We also offer the observation that liaison with other interested parties should be updated as we understand that the successor to the AHOB project is PAB.	Noted and taken into account in updated impact assessment presented in section 17.7.5.2.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	In Section 17.7.5.3 (indirect impacts to heritage assets) of the PEIR we note that paragraph 140 mentions "...localised and short-term disturbance to the beach and nearshore zone, but there would be no long-term effect on sediment transport processes." The conclusion therefore "no impact upon archaeological receptors from changes in...coastal morphology at the landfall" is not an issue that we can agree on as we are minded to direct your attention to the statements made in section 17.6.3, paragraph 89 regarding the identification on footprints which by their very nature will be immediately vulnerable to loss on exposure. The issue here therefore is to recognise that short-term disturbance and alteration, by the proposed project of "coastal morphology" could have considerable impact on presently unknown archaeological receptors.	Noted and taken into account in updated impact assessment presented in section 17.7.5.3. The selection of the long HDD option means that there will be no effect upon the beach and nearshore zone.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	It is important to acknowledge that that there are different perceptions of historic character and this element of the analysis should pay more attention to such matters in order to produce any determination of capacity to accommodate change. Similarly, the statements made in section 17.7.6.4 (paragraph 150) of the PEIR do not acknowledge the duration of this development and that it will introduce a clear change to present perception of historic character and thereby influence future perception of character. We therefore request that this matter is re-assessed within the ES.	Noted and taken into account in updated impact assessment presented in section 17.7.6.4.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	The remarks made in paragraph 168 of the PEIR must be substantiated in the draft Development Consent Order to demonstrate commitment to deliver mitigation in a timely manner to professional standards	A commitment to complete studies to professional archaeological standards and make the results publicly available has been included in this chapter.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	Historic England	11th December 2017	We welcome the attention given in Section 17.9 (Transboundary Impacts) of the PEIR to cultural heritage associated with wrecks (vessel or aircraft) of non-British, European or international identity as well as the attention given to research directed at submerged prehistoric landscapes and how recent projects have promoted pan-European collaboration. In particular we see that attention is given to possible positive effects associated with expanding knowledge and understanding. Furthermore, paragraph 177 references other European maritime policy measures and it would therefore seem appropriate to add reference to published Marine Plan policy effective in the UK that may support gain in knowledge and understanding for effective decision making.	Noted, reference is made to the East Inshore and Offshore Marine plans in Table 17.2.
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	MMO	11th December 2017	Main mitigation of a Working Scheme of Investigation and archaeological exclusion zones will require consultation with Historic England and captured in the DCO and Deemed Marine Licence.	Noted and taken forward to draft DCO through condition 14(1)(h) of the Deemed Marine Licences (DMLs).
Chapter 17 Offshore and Intertidal Archaeology and Cultural Heritage	MMO	11th December 2017	Chapter 14 of the PEIR– Offshore and intertidal archaeology has a referencing error in Page 14.	Amended

Feedback related to Infrastructure and Other Users (Chapter 18 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 18 Infrastructure and Other Users	Oil and Gas Authority	8th December 2017	Can you assure us that you have consulted with any nearby or overlying petroleum licence holders or local pipeline owners?	Relevant organisations have been contacted. Discussions will continue throughout the application, examination and post consent .
Chapter 18 Infrastructure and Other Users	British Marine Aggregate Producers Association	8th December 2017	The distribution of commercially viable marine sand and gravel resources is highly limited; constrained by their geological distribution and their geographical position relative to the markets location. Consequently, it is essential that existing marine aggregate interests (production licences, applications and option areas) are provided adequate protection against new developments that may interfere with their ongoing safe operation. Equally, given the limited spatial extent of marine sand and gravel deposits, it is also important that areas of potential future resource are clearly identified and flagged so they can equally be considered through the relevant safeguarding policy provisions provided in marine plan. In this respect, we consider that the background marine mineral resource data prepared by the British Geological Survey represents an incredibly valuable dataset, not only in terms of defining where the industry may want to go in the future, but also in highlighting where it is unlikely to go.	Comments addressed in section 18.6.6
Chapter 18 Infrastructure and Other Users	British Marine Aggregate Producers Association	8th December 2017	We note that while the PEIR concludes that there are no potential interactions with existing marine aggregate interests (licensed/application/options), it fails to reference	Comments addressed in section 18.2.1 and 18.6.6.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			the policy context that exists in the form of Policies AGG1 and AGG2 of the East Inshore/Offshore Marine Plan.	
Chapter 18 Infrastructure and Other Users	British Marine Aggregate Producers Association	8th December 2017	We note that no consideration has been given to the potential for impact areas of marine sand and gravel resource that may be considered for use in the future. Refer to para 403 of the East Inshore/Offshore Marine Plan (HM Government, 2014). We consider it necessary for the proposed assessment to take full and proper account of the potential for any marine mineral interests (licensed interests, applications and resources) to be affected by the changes being suggested. Where any potential interactions with marine sand and gravel resources and/or marine aggregate interests are identified, appropriate assessments should take place in accordance with the requirements defined by the relevant marine plan policies to demonstrate the steps taken to mitigate, manage or remove any potential negative interactions.	Comments addressed in section 18.6.6.
Chapter 18 Infrastructure and Other Users	Eni UK	8th December 2017	A primary concern of ours is ensuring that Eni UK's offshore activities in relation to the Licenses can safely interface with those of the Project.	Discussions between Norfolk Vanguard Ltd and ENI UK are on-going and will continue throughout application, examination and post consent.
Chapter 18 Infrastructure and Other Users	Eni UK	8th December 2017	A further concern is to ensure that windfarm infrastructure siting does not have a significant adverse impact on Eni UK's ability to search for and develop petroleum within the area of the Licenses.	Comments addressed in section 18.6.4.
Chapter 18 Infrastructure and Other Users	Eni UK	8th December 2017	Eni UK requests that a mechanism be included in any DCO granted which requires the applicant to	Discussions between Norfolk Vanguard Limited and ENI UK are on-going (see further information in the

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			consult with Eni UK prior to undertaking any conflicting offshore activities.	Consultation Report, document 5.1) and will continue throughout application, examination and post consent.
Chapter 18 Infrastructure and Other Users	Sheringham Shoal (Scira Offshore Energy Ltd)	8th December 2017	Due to the expected scale of Vanguard, we fear potential grid outages or curtailments caused by the construction of Vanguard and potential loss of production at Sheringham Shoal. Scira would therefore welcome mitigation measures aiming to minimise or compensate any disruption to Scira's business.	Grid capacity is a matter for National Grid and is outwith the scope of this assessment.
Chapter 18 Infrastructure and Other Users	Tampnet	8th December 2017	A key issue is the crossing by one or more of the export cables, and one or more of the inter-array cables, of our fibre optic cables. This is in general accepted but will be pending our agreement and acceptance of a suitable crossing design. Our main goal is to maintain our ability to repair our cables and make sure the crossings happen in a safe way.	Discussions have commenced and will continue throughout application, examination and post consent. A crossing agreement will be sought from Tampnet.

Feedback related to Ground Conditions and Contamination (Chapter 19 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	National Farmers Union	December 2017	<p>Details of how soils will be treated and where stored during construction must be provided. Along with how sub and top soils will be kept separate and kept clean during the construction period. Due to the damage to soils during construction works must only take place when conditions are acceptable. During very wet conditions and if soils are waterlogged construction should be stopped. Further it is important for Vattenfall to set out how after soil has been reinstated what measures will be put in place to bring the soil back to its condition and quality before the works took place. An after care plan should be included in a Code of Construction. To enable the aftercare plan to be put in place Vattenfall must make sure that a record of condition is taken pre –construction including soil samples to determine the soil structure and the nutrients. This can then be used to set a soil target specification for each field on a holding. The soil target must also include yield records which can be provided by the landowner/occupier. The NFU is pleased to see that a Code of Construction has been mentioned along with a Soil Management Plan but the NFU would have expected to see draft details of these two documents within this PIER. The NFU would like to see draft documents as soon as further details are available and before the submission of the DCO.</p>	<p>Potential impacts on soils are discussed in Chapter 21 Land use and Agriculture, section 21.6.4 and 21.7.4.3. Handling and protection of soils, including measures such as the separate storage of topsoil and subsoil, and ceasing work during wet weather, will be managed through the Soil Management Plan, which has been produced and submitted alongside the DCO application. The Outline Code of Construction Practice also includes best practice measures for soil handling, which has been produced and submitted alongside the DCO application.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	Environment Agency	December 2017	<p>In common with comments made regarding WFD issues for surface waterbodies, neither designation nor WFD status is a satisfactory indication of sensitivity to impacts. We disagree with Secondary Aquifers being identified as a low sensitivity receptor. These aquifers are often very important in supplying base flow to surface waters and are frequently in hydraulic continuity with the underlying principal aquifer particularly in the east of the application area. Similarly, we would not consider unlicensed water supplies low risk.</p>	<p>Designations and WFD status are not used as an indication of sensitivity to impacts on surface water bodies. The Secondary Aquifers A sensitivity was changed to moderate and Secondary B / undifferentiated remained designated as low. See section 19.4 and Table 19.4.</p>
Chapter 19 Ground Conditions and Contamination	Environment Agency	December 2017	<p>We agree with the recommendation in paragraph 57 to undertake ground investigation and further assessment of the made ground in the on-site source areas at the dismantled railway lines and Bacton oil terminal. As well as establishing the risk to construction and potential for the re-use of soils, the investigation should also consider potential risks to controlled waters. We agree with paragraph 59 that protocols for dealing with unexpected contamination should be set in place prior to construction with the procedures agreed with the Regulators. This should include proposals to deal any waste soils extracted from the cable run.</p>	<p>Embedded mitigation measures related to contaminated land management are described in Table 19.14.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	Campaign to Protect Rural England (CPRE)	December 2017	<p>7. Table 19. National Planning Statement describes the National Planning Statements for Nationally Significant Projects and quotes two which are relevant to the project. These are the overarching NPS for Energy EN-1 DECC 2011a and Electricity Networks Infrastructure EN-5 DECC, 2011b. EN-1 at section 5.3 states that the applicant clearly sets out any effects on designated sites of ecological or geological importance, protected species and on habitats and other species important to the conservation of biodiversity. The ENS section states that underground lines do not require development consent under the Planning Act 2008.</p> <p>Comment: There are in practice constraints on undergrounding, see comments by the Environment Agency at page 6 and tables 19.3 and 19.4 Both EN-1 and EN-5 are superseded on one important issue by the National Planning Policy Framework of March 2012, and this is particularly important for EN-1. EN-1 does not make any reference to ecological networks, and there is inadequate or no comment by Vattenfall (or Ørsted). Both companies should note and act on what the NPPF says at Chapter 11 Conserving and enhancing the natural environment on this point. Paragraph 109 Minimising impacts on</p>	Reference to North Norfolk District Council Policy EN 9 Biodiversity Appendix B on the ecological network and the importance to the Chalk Rivers in the district is made in section 19.2.2.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>biodiversity and providing net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures. The North Norfolk District Council Policy EN 9 Biodiversity has a six-page Appendix B on the ecological network and the importance to the Chalk Rivers in the district.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	Campaign to Protect Rural England (CPRE)	December 2017	<p>41. Ground investigations are ongoing at key trenchless (eg HDD) crossing locations listed: Crossing 1 – A47; Crossing 2 –Norfolk Railway east and west sides; Crossing 3 – River Wensum east and west; Crossing 4 - River Bure west and east/Crossing 5 – A140; Crossing 6 – A149/Crossing – Norfolk Railway; Happisburgh South Landfall. We note that in addition there are trenchless crossings to the north west of North Walsham (from the route corridor maps looks to be the North Walsham and Dilham Canal), and just north of Bacton Wood/Witton Heath, presumably to underground the road running north-south to Horning and the Broads, a major tourism area.</p> <p>Comment: We would be supportive of these two additions, but suggest that there are a number of other locations which would benefit from a trenchless approach, and these should be identified in the next stage of work.</p>	Trenchless crossing techniques have been identified for a range of locations, and these are summarised in detail in Chapter 5 Project Description and Chapter 20 Water Resources and Flood Risk.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	Campaign to Protect Rural England (CPRE)	December 2017	<p>58. The onshore cable corridor crosses four main catchment river catchments. Some tributaries and wetland areas for each river are listed. For the River Bure the most notable tributary is King’s Beck. The downstream reaches of the river have a range of wetland features, including Hoveton Great Broad and Marshes, Woodbastwick Fens and Marshes, Bure Marshes. The River Wensum and several of its tributaries would be crossed, most notably Wendling Beck and the Blackwater Drain. The River Wissey headwaters fall within the area for the Necton National Grid substation extension. The North Walsham and Dilham Canal is crossed at North Walsham (see 41 above; note also a leisure interest).</p> <p>Comment: The tributaries and wetlands listed above and others should be considered for a trenchless crossing to minimise the risk of silt entering the river systems, and not adding to the loading caused by arable run-off, a major problem for all rivers entering the Broads (Bure, Wensum and Ant). Those running into the Wensum have the additional issue is that the whole upper reach of the river is designated SAC.</p>	Trenchless crossing techniques have been identified for a range of locations, and these are summarised in detail in Chapter 5 Project Description and Chapter 20 Water Resources and Flood Risk.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	Campaign to Protect Rural England (CPRE)	December 2017	<p>59. The baseline hydrology is described in more detail in Chapter 20 Water Resources and Flood Risk, but we note Tables 19.10 and 19.13 which show the status of the Broadland Rivers Chalk and Crag groundwater body and that of the North Norfolk Chalk groundwater body.</p> <p>114. It is anticipated that surface watercourses are in hydraulic connectivity with groundwater contained within superficial deposits throughout the study area. The River Wensum is a chalk river that is designated as an Special Areas of Conservation (SAC) and Sites of Special Scientific Interest (SSSI) and is therefore considered to have high sensitivity. Tributaries of the Wensum such as Wendling Beck and the Blackwater drain are also considered to have high sensitivity, on the basis of their direct connectivity with the main River Wensum, on their basis of their direct connectivity with the main River Wensum.</p> <p>Comment: A team at UEA shows that much of the silt getting into a river system does so in a heavy rain event; and that in a drainage ditch will move on in the next heavy rain event until it reaches the main river. As such ditches only periodically in hydraulic contact with the groundwater also pose a risk.</p>	Reference to the connectivity between groundwater and surface drainage systems has been included in section 19.7.5.5.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 19 Ground Conditions and Contamination	Campaign to Protect Rural England (CPRE)	December 2017	<p>116. The overall impact on indirect or contamination of surface watercourse based on the situation which includes the integration of measures adopted in section 19.7.1 is considered to be minor adverse which is not significant in EIA terms. Comment: We consider there is a divergence between the theory and what happens on the ground. As a marker consider the persistent and severe problems with agriculture and arable run-off, in spite of good practices ELS, etc. As well as the adverse impact on rivers, it can also result in flooding of property.</p>	The risk associated with adverse impact on rivers resulting in flooding of property is discussed in Chapter 20 Water Resources and Flood Risk section 20.7.4.
Chapter 19 Ground Conditions and Contamination	Anglian Water	December 2017	<p>We have had discussions with Vattenfall relating to ground investigations associated with the onshore cable route in the vicinity of an existing borehole in Anglian Water's ownership. The proposed onshore corridor includes a number of locations in groundwater source protection zone 1. Further consideration should be given to any potential implications for existing boreholes in Anglian Water's ownership from the construction of proposed onshore elements of the proposal.</p>	Embedded mitigation measures related to works undertaken within Source Protection Zone 1 (SPZ1) areas are described in Table 19.14.
Chapter 19 Ground Conditions and Contamination	Anglian Water	December 2017	Reference is made to a number of groundwater source protection zones in the area of the above project. We would wish to ensure that the proposals and any related	Embedded mitigation measures related to works undertaken within SPZ areas are described in Table 19.14.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			development do not have an adverse impact on existing boreholes which are used for the supply of potable water by Anglian Water.	

Feedback related to Water Resources and Flood Risk (Chapter 20 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Suffield Parish Council	December 2017	This is a very 'wet' area. We are concerned about the proposed works adversely affecting the already high water table. We want to be assured that all works carried out have adequately taken the water levels into account and that we will not suffer long term change as a result of these works.	Potential impacts on groundwater are addressed in sections 20.7.3 and 20.7.4, and in Chapter 19 Ground Conditions and Contamination. Impacts on flood risk are assessed in Appendix 20.1.
Chapter 20 Water Resources and Flood Risk	Ørsted	December 2017	Hornsea Project Three would welcome information relating to assessments of field drainage and irrigation.	Comments addressed in section 20.7.3.
Chapter 20 Water Resources and Flood Risk	Ørsted	December 2017	Hornsea Three is included in the cumulative assessment, albeit onshore construction is noted to be "2016-2019". This is incorrect and should be corrected.	Amended in section 20.8.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	NSAG	December 2017	<p>Vattenfall have never fully investigated the historical flooding in the area. They have never consulted or listened to 'local knowledge'. Attached is a map provided by http://www.checkmyfloodrisk.co.uk/ which shows just how bad this site selection is. You can clearly see that the whole area of existing and proposed substations drains into one water course, which has regularly flooded historically. Local knowledge tells us that the land in this area does not allow water to soak through, and that disturbing all the drains, which reduced the flooding incidences, will create unacceptable far-reaching flooding risk in many local communities.</p> <p>Also attached are some photographs showing historical flooding in Ivy Todd and West End, before the farm drainage was installed. It can be seen that Dudgeon substation already uses the same watercourse as the new proposed substations. This watercourse cannot possibly take the extra run-off Vattenfall would create. Please see enclosed flooding map of the area and historical photographs.</p> <p>Vattenfall have said that the Environment Agency flood risk maps show a low risk at the connection but they do not appear to have consulted the maps with regard to the high risk of flooding on the land surrounding their selected substation site. Vattenfall appear to be using ambiguous language to disguise the fact they are building in a high flood risk area and we object to the proposal on the grounds of high flood risk.</p> <p>We object to this development as it does not</p>	Potential impacts on water levels and flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			follow Breckland policy and will undoubtedly make flooding worse in several areas.	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk			<p>This information is not complete. It fails to state that the project substation land area does not flood at the moment, but that this is only because it had a field drainage system laid, probably more than 50 years ago. By definition, 'the purpose of a land drain is to allow water in wet or swampy ground to rapidly drain away'. If this agricultural land was not artificially drained it would not grow crops, as it would be too wet, so would not be deemed low flood risk. The run-off from 37 acres of concrete created by the substations will inevitably cause the adjacent land mentioned by Vattenfall above, to flood. The next point shows that even climate change could be a threat to the efficiency of the land drainage.</p> <p>Important points are missing from the flood assessment because if land drainage couldn't cope with climate change, any construction work will certainly destroy this established drainage pattern, destroy delicate eco systems and potentially cause flooding in other areas.</p> <p>Although the project substation is in a zone 1 low flood risk area, as artificially drained, it is very close to zone 3 high risk areas as stated in the next 2 points. We are concerned that these high-risk areas could be worsened by the nearby construction works.</p> <p>We object to this project on the grounds that flood assessments are muddled and incomplete and take no account whatsoever of local knowledge, which we have now supplied from people who were born in the area.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Robert Scott MRICS FAAV Freelance Farm Business Consultant Working on behalf of Savills (UK) Ltd	December 2017	You'll note I represent both Dillington Hall Estate and Gorgate Limited (whom border each side of the Wendling Beck). Both are very anxious about how the river is to be crossed and the continued open-cut design.	Wendling Beck will be crossed using a trenchless technique, as outlined in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.
Chapter 20 Water Resources and Flood Risk	Susan Falch-Lovesey Local Liaison Officer, Norfolk Vanguard and Boreas	December 2017	<p>Issues noted in my briefing to the consents team;</p> <ol style="list-style-type: none"> 1. Wendling beck, runs down valley and then between two SSSI's. Natural England have spent significant amount of money on the route that they feel could be wasted, should the 'open cut' method be used instead of HDD. Indeed, Natural England link was very concerned. NWT and NRT (Norfolk Rivers Trust) are supporting the estate to review this situation and prepare a plan to protect the improvements. 2. NRT are concerned that downstream there has also been work done on the Hoe Ruff (NWT) site and that any discharge of 'highly charged silt' will have a very negative impact. They want Vattenfall to confirm that this will not happen and if something does, that we will ensure it is restored to the current quality. 3. Finally, 3-4 km downstream the NRT have been engaged by Michael Goff to recreate a wetland (private funding). This is planned to take shape before our work would start... question is do we know about this and will we mitigate /restore if there is damage. 	<p>Wendling Beck will be crossed using a trenchless technique, as outlined in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.</p> <p>Sediment management measures are described in detail in section 20.7.1, and the potential impacts of increased sediment supply on surface watercourses are assessed in section 20.7.3</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Norfolk County Council	December 2017	<p>The County Council would wish to see that any drainage strategies contain maintenance and management plans detailing the activities required and who will adopt and maintain the surface water drainage features for the lifetime of the development. Further detailed comments relating to flood and drainage issues are set out in the Appendix.</p> <p>The report indicates that the onshore project area will largely be located on rural, agricultural land. Therefore, the majority of the project shall be located within areas where there are no existing formal surface water drainage systems, other than agricultural land drains and ordinary watercourses. Risk to any nearby properties should also be considered – no reference to this was found in the submission.</p> <p>The CRS location options are located within Flood Zone 1, as defined by the Environment Agency online Flood Map for Planning. Flood Zone 1 is defined as land as having a less than 1 in 1,000 annual probability of river flooding (<0.1%). The onshore cable corridor is located within Flood Zones 1, 2 and 3 and the Happisburgh landfall location is located within Flood Zone 3 as defined by the Environment Agency online Flood Map for Planning. However, there are many ordinary watercourses within the proposal area and these also have a flood risk associated with them (equivalent to flood zone 2 and 3). These areas of risk are not shown on the Environment Agency Map as the catchments are smaller than 3km² and are not included on the national map. The</p>	<p>Drainage management measures are outlined in section 20.7.1.</p> <p>Potential impacts on flood risk, main rivers, IDB drains and ordinary watercourses are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>proposal should consider this local source of flood risk to ensure that all sources of flooding have been assessed.</p> <p>The onshore cable corridor is influenced by three key hydrological catchments, and intersects significant watercourses at six key crossing points. In addition, there are a number of minor watercourses, land drains and ditches the onshore cable corridor will cross however, these have been reviewed using a high-level approach. Additionally, there are a number of Internal Drainage Board (IDB) channels which cross the onshore project area. Furthermore, there are a large number of ordinary watercourses and agricultural drainage channels.</p>	
Chapter 20 Water Resources and Flood Risk	The local County Council for Necton and Launditch division (Cllr Kiddle-Morris) (In Norfolk CC response)	December 2017	<ul style="list-style-type: none"> Flood Risk and Drainage – further work is required by the applicant regarding the flood risk and drainage issues arising from the proposed new Vanguard sub-station. In particular the issue of potential run-off from the proposed new sub-station onto local country lanes in the area needs fully addressing; 	Potential impacts on flood risk, are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Norfolk County Council	December 2017	<p>The applicant is suggesting that trenchless crossing techniques will be used for the larger watercourse crossings (specifically the River Wensum, River Bure, King's Beck, Wendling Beck (downstream), and the North Walsham and Dilham Canal) - Paragraph 20.4.3.5 – 64 of the FRA indicates that this will be by passing under watercourses (at least 2m below the river bed). However, the project also includes numerous trenched watercourse crossings within river water body catchments, with one trenched crossing of the main Wendling Beck watercourse, also designated as a main river by the Environment Agency, and a trenched watercourse crossing of the Blackwater Drain main river. Where the proposals involve works to any ordinary watercourse a consent will be required. The number of these, where applicable, should be determined and applications for block, or phased consents should be made to the appropriate authority, including the flood and water management team at Norfolk County Council or the Internal Drainage Board.</p>	<p>Wendling Beck will be crossed using a trenchless technique, as outlined alongside other embedded mitigation measures in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Norfolk County Council	December 2017	<p>The assessment states that during the temporary damming and re-routing of watercourses required during the construction of the onshore cable corridor, the original flow volumes and rates need to be maintained to ensure flood risk is not increased at the construction site and elsewhere. Post-construction, watercourses should be reinstated to pre-construction channel depths and bank slopes as far as possible to ensure flood risk is not affected. Mitigation of the existing flood risk at key crossing points during the construction phase of the project will need to be managed. Any construction work located within Flood Zone 2 or 3, or within proximity to an ordinary watercourse should undertake suitable risk assessments, including the formation of site specific evacuation routes into areas of low flood risk. It is also advised that any temporary plant storage including potentially polluting substances e.g. oil storage is located above expected flood levels. On ordinary watercourses (where there are no formal flood warning systems in place) we suggest that the applicant consider signing up to available weather alerts from the Met office. This could help understand when significant rainfall may be expected and could go to provide onsite procedures to halt any works within watercourses to prevent an increased risk from in channel workings.</p>	<p>Potential impacts on flood risk, are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1. Embedded measures to prevent contamination are described in section 20.7.1, and potential impacts resulting from the accidental release of pollutants are assessed in sections 20.7.3 and 20.7.4.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Norfolk County Council	December 2017	It states in paragraph 20.7.3 (Post construction), that following completion of the project the onshore cable corridor shall be located below ground level and as such would have no impact on surface water drainage. Temporary works and all access route surfacing shall be removed and would have no operational use. This risk of creating a 'conduit' should be considered when assessing any backfill materials to the trench, and how this could affect the local flow routes (i.e. changes to the permeability of the site). The surface water drainage requirements for the permanent compounds will be dictated by the final drainage study.	Potential impacts on water levels and flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Norfolk County Council	December 2017	<p>The FRA states that the SuDS philosophy will be employed to limit run-off, where feasible, through the use of infiltration techniques. Discharge should be limited to greenfield run off rates, where infiltration is not possible, by reducing rates and volumes of run off associated with the project during operation via the integration of effective surface drainage systems.</p> <p>In the submission it is proposed to limit post development off site run-off to the existing greenfield rate and provide sufficient onsite attenuation for rainfall events up to 1 in 100-year rainfall event, plus a 30% allowance for climate change over the lifetime of the development (however we would recommend that this be increased to 40%). However, there is no assessment of the current and proposed runoff rates to determine the surface water attenuation requirements for the sites in line with The SuDS Manual (2015), which should indicate that the flow rate discharged from the sites must not exceed that prior to the proposed development for the 1 in 1 year event; 1 in 30 year event; and 1 in 100 year event. The sites have not yet been assessed against a 'greenfield' baseline, assumed to be 100% permeable surfacing with areas of 2.5ha and 10ha respectively. Further information should be requested to be provided at design stage.</p> <p>The FRA and supporting documentation shows that the proposed development at present meets the requirements of the NPPF. At this stage it has not been determined what method of discharging</p>	Potential impacts on water levels and flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>surface water will be utilised in the final design and no assessment of the current or proposed runoff rates has been undertaken. The County would also wish to see that any drainage strategies contain maintenance and management plans detailing the activities required and who will adopt and maintain the surface water drainage features for the lifetime of the development.</p>	

Chapter 20 Water Resources and Flood Risk	National Farmers Union	December 2017	<p>The major potential lasting damage is to land drainage systems and soils structure. One of the main reasons for the productive land the cable duct route is going through is that the farms are very well drained by a network of clay or plastic land drains laid in parallel every 20 metres or so across the field at depths of up to 1.8 metres draining into a field edge ditch or dyke. These drainage systems prevent water pooling in fields and increase the productive capacity of the agriculture in the area. Good land drainage increases farm productivity by keeping waterlogging to a minimum, increasing soil strength by reducing water content, gives higher soil temperatures and leads to more efficient use of applied fertilisers. According to the Agricultural Notebook the yield advantage for most crops when comparing drained and undrained treatments is typically 10 to 25 per cent. Assuming land drains are laid every 20 metres in farmland (they are laid more closely in some cases) and assuming the whole route is farmland, which it is not, but it mainly is, the cable ducts/trenches will cut thousands of land drains in six places for each land drain. Major pipeline constructors will cut a trench and the land drains then place the pipeline in the trench and re-connect the land drains above the pipe. It is a drainage rule of thumb that with a major pipeline one in every six land drains does not work after the soil is replaced around the pipe. This will not just affect the 50 to 100 metre working width but could potentially affect the whole field where the cable duct goes through and therefore every arable field along the route.</p> <p>As highlighted above Vattenfall have stated that</p>	<p>Embedded mitigation measures to manage site drainage such as a Drainage Plan, selection of HVDC technology are described in section 20.7.1.</p> <p>Potential impacts on water levels and flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.</p>
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			<p>the ducts will be laid below field drainage at 1.05m. We are not sure that this will be possible and it might be that the ducting will have to be deeper if it is to be below field drainage.</p> <p>The NFU would like to agree standard terms of how field drainage will be treated in principle on every farm and for this wording to be taken forward and included in the Soil Management Plan and for this document to be certified as part of the Development Consent Order. The wording normally covers before, during and after construction. It will be important in places for field drainage to take place outside of the order limits and this will need to be agreed along with a local drainage consultant being taken on by Vattenfall at the pre –construction stage.</p> <p>The NFU is disappointed by the lack of information covering field drainage in the PIER. The only reference found is in table 21.13 Embedded Mitigation where it states that land drainage would be maintained during construction and reinstated on completion and that consultation will be carried out with landowners. Vattenfall must be prepared on behalf of all landowners and occupiers affected by the scheme to reinstate drainage systems to landowners’ reasonable satisfaction and to ensure that the drainage system is put back in a condition that is as least as effective as the previous condition.</p>	
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Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Necton Parish Council	December 2017	<p>Necton has a well-documented history of flood issues, the root cause lying in the topography of the area. Disturbance to large areas of agricultural land to the north of the village will increase the number and extent of flooding instances within and around Necton and Ivy Todd. The presence of the Dudgeon Wind Farm is already identified as a likely cause for the increase of floodwater running down through Kett's Hill and Ramm's Lane – a matter that the Parish Council is currently discussing with Norfolk County Council Highways and Anglian Water. This is not only run off water, but sewage backing up through interior sanitary units and gardens being flooded with sewage. Chapter 20, Water Resource and Flood Risk, appears to be crafted simply from desk research and not local knowledge gleaned from Necton consultation events. There is no evidence of current water run-off measurements or other on-site analysis to identify existing water discharge patterns.</p> <p>The report speaks of 'the connection point' making it unclear if there has been adequate analysis of the two distinct proposed sites – National Grid extension and Vanguard and Boreas substations which are over 700 metres distant from each other. Between them during their approximate 18 months construction period, they will occupy a total of approx. 540,000 sq. metres of disturbed ground.</p> <p>The proposal does not provide enough consideration of the realistic flood risk impact or mitigation measures to help inform a view as to</p>	Potential impacts on water levels and flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			the suitability of this proposal on these identified sites.	
Chapter 20 Water Resources and Flood Risk	NRIDB	December 2017	<p>NRIDB have been involved in initial design and planning discussions and will continue to input into the project to ensure suitable drainage and environmental solutions are delivered.</p> <p>The crossing of every ordinary watercourse within the boards district will need to be consented at the cost of the applicant. An application for the relaxation of byelaw 10 and or an application to alter a watercourse will be required for each structure in order for the works to be consented by Norfolk Rivers Drainage Board. Details regarding the consenting process can be found on our website http://www.wlma.org.uk/norfolk-idb/development. WMAs standard utility crossing detail for IDB Main watercourses (attached) must</p>	Embedded mitigation measures to prevent impacts on IDB drains and other watercourses are outlined in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			be followed unless alternative details have been agreed with a WMA Engineer. Each crossing affecting a IDB main drain will require a licence agreement. An example of which is attached.	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>Independent Drainage Board (IDB) managed water courses are Ordinary Watercourses and therefore the categories used in Table 20.10 are incorrect. The management body for those watercourses is not an indicator of their ecological value or sensitivity to change. IDB managed watercourses should not be routinely classified as 'low value and sensitivity' as stated at Section 20.7.3.1.2, many are free flowing chalk streams with gravel substrates; they are not necessarily low gradient pumped systems. However, even pumped IDB drains in Norfolk are a key freshwater habitat which support plants and animals of conservation importance e.g. sharp-leaved pondweed, stoneworts, little whirlpool ramshorn snail, Desmoulin's whorl snail and Norfolk hawkler to name a few. As stated previously, a WFD classification is not a satisfactory indication of sensitivity to impacts such as used in paragraph 101, for example. To illustrate, a waterbody with a lower WFD class may be more sensitive due to existing problems such as low flows, low dissolved oxygen and siltation problems, but this does not mean that it will not suffer further from other impacts nor does it lessen the requirement to strive for 'good' status. All practicable steps must be taken to mitigate any adverse impacts caused by works on the status of the body of water. Where a waterbody is failing, we would encourage the applicant to look for mitigation and enhancement options. Because the premise of valuing the waterbody and sensitivity is incorrect this has</p>	<p>The approach to assigning sensitivity and value to surface water receptors has been updated, and is now based on hydrological catchments rather than type of watercourse. Full details are provided in section 20.6.4. Sensitivity and value have been defined according to observed geomorphological characteristics and habitat value rather than WFD status, as outlined in section 20.6.4.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>implications for the impact assessment summaries this section, this needs to be reviewed. This approach to assessment has been applied to each type of watercourse throughout the chapter which under-estimates the impacts and therefore, conclusions drawn from this cannot be relied upon. It follows then, that we cannot have confidence in the appropriateness of the techniques chosen nor mitigation that is recommended. It is important that any approach to assessing the impact upon watercourses recognises and accounts for the key requirement of WFD objectives that there should be 'no deterioration in overall WFD status or in the individual WFD elements.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>Catchment based approach</p> <p>In Section 20.7.3.1.3 it states that Ordinary Watercourses has negligible value due to “tolerance to changes to hydrology, geomorphology or water quality”. This statement is incorrect. Taking a catchment based approach is a key government policy; 70% of a rivers length is within its headwaters (which are ordinary watercourses and ditches). These smaller watercourses are a significant freshwater habitat and it is important to recognise the contribution they make to water quality of the river as a whole. Smaller watercourses can be more sensitive to pollution because there are lower flows and a lower dilution factor compared to in the main rivers. Smaller watercourses are also very sensitive to geomorphology changes as because their small scale is more sensitive to over deepening and widening caused by work with excavators. Where WFD identifies that a waterbody is failing, this presents an opportunity for mitigation and enhancement.</p>	<p>The approach to assigning sensitivity and value to surface water receptors has been updated, and is now based on hydrological catchments rather than type of watercourse. Full details are provided in section 20.6.4.</p>
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>Section 20.7.3.3 refers to the Pollution Prevention Guidance Series, which was withdrawn in England. Please see http://www.netregs.org.uk/environmental-topics/pollution-prevention-guidelines-ppgs-and-replacement-series/ for more information. The embedded mitigation measures described in 20.7.1 for trenched crossings are inadequate, there should be measures to ensure continued flow e.g. by only damming part of the river or by over-pumping with measures in place to prevent</p>	<p>Embedded mitigation measures are described in detail in section 20.7.1.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			fish kills. The timing of the works for the trenched crossings must not coincide with fish breeding season or key migratory periods. The channel bed should be reinstated with the same substrate profile; that is making sure that gravels are put back on the top of the bed. Gravels are an important part of the river habitat, the well-oxygenated spaces in-between stones provide habitat and shelter for invertebrates as well as spawning sites for fish.	
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	Both during the works and immediately post works. Invasive non-native species are a significant concern in the aquatic environment – especially to WFD status and there is a risk of spreading crayfish plague – threatening our work to conserve the endangered white-clawed crayfish. Yet there are no control measures relating to preventing the spread of invasive species between crossing points and between catchments.	Embedded mitigation measures are described in detail in section 20.7.1.
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	In table 20.2 the classification of Heavily Modified Waterbodies is not described correctly. E.g. the East Ruston Stream is at Moderate Potential due to dissolved oxygen and the mitigation measures which are not in place (mitigation measures assessment is moderate).	The water body data quoted in the ES and Appendix 20.2 was provided by the Environment Agency.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>The control measures stated in 20.4.3.2 are not adequate, the temporary impacts of carrying out the works have not been considered, the difference between temporary and permanent impacts has not been made clear. The control measures are detailed in some areas e.g. use of drip trays for machinery but they are missing key actions to mitigate against impacts. We would expect control measures to address the following issues:</p> <ul style="list-style-type: none"> · Maintaining flow e.g. partial coffer dams, · Preventing fish deaths from over-pumping · Minimising run-off from cable route (there will be a large area of land with bare soil immediately post completion, measures should be implemented to reduce run-off over key pathways e.g. slopes, onto roads, and directly into the watercourse, this could be through cutting small channels to intercept flow, retaining hedgerows and grass buffer strips or using shallow depressions (SuDS) to contain sediment laden runoff). Likewise, the creation of woodland corridors and the retention, replacement and enhancement of hedgerows is a broader scale mitigation which reduces soil loss and sediment flow into watercourses. · Timing of works to avoid fish breeding seasons and fish migration periods · Ensuring that gravels are retained in the channel bed, that is placed back on the surface · Ensuring that temporary impoundments do not have a negative impact on dissolved oxygen concentrations, water temperature 	Embedded mitigation measures are described in detail in section 20.7.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<ul style="list-style-type: none"> · Minimising sediment disturbance within the channel and containing silt substrates to avoid causing low oxygen concentrations and thick silt deposits immediately downstream of works · Control measures for non-native and invasive species should be in place (this has been commented on in more detail in the ecology and biodiversity section) 	
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	The use of culverts is mentioned as a control measure in 20.4.3.2. However, it is not clear if these are existing, temporary or permanent. The impacts of the culverts need to be assessed.	Embedded mitigation measures are described in detail in section 20.7.1. Potential impacts resulting from watercourse crossings, including culverts, are assessed in section 20.7.3.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	In paragraph 96 damming and diverting of the watercourses are mentioned as a control measure, these activities have an impact which needs to be assessed as part of the WFD compliance assessment. Damming watercourses have potential impacts for fish and diverting water can transfer of non-native invasive species.	Potential impacts resulting from watercourse crossings, including temporary works during the construction phase, are assessed in section 20.7.3. Potential impacts on WFD quality elements are discussed in Appendix 20.2 (WFD compliance assessment).
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	Paragraph 100 states that the impacts to the biology quality elements e.g. invertebrates and macrophytes will be prevented by the embedded mitigation. The embedded mitigation is not adequate, and there will be unavoidable localised impacts which may cause WFD deterioration.	Embedded mitigation measures are described in detail in section 20.7.1. Potential impacts on WFD quality elements are discussed in Appendix 20.2 (WFD compliance assessment).
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	Paragraph 101 states there is no potential impacts on hydromorphology, physico-chemistry and biology quality elements at watercourse crossings. This is not correct. There are potential impacts on hydrology is the flow is not maintained. Also there are potential impacts on physchem, if sediment is not contained and if the water is impounded there could be impacts on dissolved oxygen and water temperature.	Potential impacts on WFD quality elements are discussed in Appendix 20.2 (WFD compliance assessment).
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	Paragraphs 123 and 124 contradict each other regarding potential impacts on physchem	Potential impacts on WFD quality elements are discussed in Appendix 20.2 (WFD compliance assessment).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	No waterbodies or activities have been selected for further assessment at Stage 3 of WFD compliance assessment, yet the answer to the scoping questions is yes in Table 20.2.1. This doesn't follow the methodology properly which was set out in 20.3.3.3. Our guidance 488_10 which was referenced states that impacts on priority habitats and species must be considered, this is not addressed in the WFD compliance assessment. Opportunities to improve the water environment have not been sought as set out in 488_10. Creating a new cable route crossing on this scale, are not low risk activities and therefore, the impacts of these activities must be assessed at stage 3 – further assessment.	<p>Potential impacts on WFD quality elements are discussed in Appendix 20.2 (WFD compliance assessment).</p> <p>Additional water bodies have been screened in to the detailed assessment stage.</p>
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	Section 20.7 Potential Impacts. We are not agreement with the approach of considering the Poor chemical WFD status of the Broadland Chalk & Crag WFD groundwater body to be of low sensitivity because of its status. It is classified as Poor because it fails one of the qualitative tests – the test for nitrates; otherwise there is no issue with chemistry and the body is heavily used for abstraction and so of significant value to the area. The Poor status means that it should be treated as being of at least equal sensitivity; it is essential that no further deterioration occurs. The principal Crag and chalk aquifers are being treated as being as of high sensitivity. This is correct. These aquifers comprise the Broadland Crag and Chalk WFD groundwater body. It therefore seems incorrect to apply different levels of risk to essentially the same thing. We would suggest that	The approach to defining the sensitivity of groundwaters has been amended, as outlined in section 20.6.4.2.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>this entire section needs to be re-considered to reflect the above points, treating both the groundwater body and its component aquifers in the same way in terms of sensitivity and risk. The assessment framework should also include the value of shallow aquifers and their role in supplying baseflow to watercourses as well as being exploited for water.</p>	
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>Table 20.2 p 15. The secondary aquifer definitions require clarification. If there is recharge and accessible pore space, this fulfils the function of an aquifer. We are uncertain about the discussion about recharge that states ‘Does not provide recharge to groundwater’. This statement should be clarified.</p>	<p>This statement has been removed from Table 20.2.</p>
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>Tables 20.3 and 20.4. We are uncertain whether these tables apply to groundwater as well as surface water. This should be clarified.</p>	<p>The tables apply to surface and groundwater. This has been clarified in section 20.4.1.</p>
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>20.7.3.4.4. 168. The Crag should also be noted as a principal aquifer.</p>	<p>This has been clarified in section 20.7.4.1.3.</p>
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	<p>20.7.3.4. 173. It is unclear whether or not the excavations be above the water table in the shallow aquifer which should be clarified. It will be necessary to assure there aren’t any significant changes in shallow aquifer groundwater flow.</p>	<p>This has been clarified in section 20.7.3.3.4.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	20.7.4.1.4. This section should include consideration of the potential for adverse impacts on abstractions from the shallow aquifer within the cable corridor or within close proximity to it.	This has been clarified in section 20.7.3.3.4 and section 20.7.4.2.4.
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	We would like to remind you of our earlier point that the WFD status does not represent the Ecological value of a watercourse. Even Waterbodies which are not classified under the WFD may still be important for their ecology including IDB field drains and some field ditches. In addition, we would expect any work carried out to result in no overall deterioration in the existing condition of any waterbody, or in the WFD water catchments as a whole. Where WFD identifies that a waterbody is failing, this presents an opportunity for mitigation and enhancement.	The approach to assigning sensitivity and value to surface water receptors has been updated, and is now based on hydrological catchments rather than type of watercourse. Full details are provided in section 20.6.4.
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	20.6.11 – Point 70 details a number of sub catchments. Of the 14 waterbodies listed, over half have records of Brown Trout, Bullhead and Brook Lamprey (Annex II species under the Habitats Directive). The EIA does not take account of the importance of these waterbodies for these species which require high dissolved oxygen (DO) levels, good water quality and access to gravel substrate for spawning or feeding. If trenched water crossings are to go ahead as planned, we will require detailed method statements which can clearly demonstrate what measures will be in place to protect water quality, turbidity, and DO levels, and what plans are in place to reinstate spawning gravels after excavation.	Embedded mitigation measures are described in detail in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	20.7.3.4.1-Point 156- North Walsham and Dilham Canal – WFD status does not equate to low sensitivity as a potential receptor site for pollutants. This misconception is repeated throughout the EIA. As discussed earlier, equal care needs to be taken where status is poor, as this poor status can leave the watercourse more vulnerable to the adverse effects of work. Where a waterbody is failing, we would encourage the applicant to look for mitigation and enhancement options.	The approach to assigning sensitivity and value to surface water receptors has been updated, and is now based on hydrological catchments rather than type of watercourse. Full details are provided in section 20.6.4.
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	During the application stages we would expect to work with you to agree methodology to prevent leaks of drilling lubricant during HDD. Where this has occurred in the past, cracks in the underlying geology caused by drill vibrations have resulted in the release of lubricant (usually fine Bentonite clay) into sensitive receptors ('Frac out').	Embedded mitigation measures are described in detail in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.
Chapter 20 Water Resources and Flood Risk	Environment Agency	December 2017	The landfall comprises a stretch of coastline approximately 1.5km from Beach Road in the north to just north of Cart Gap Road in the south'. We have therefore, assessed this landfall site option only, as part of this consultation. At the Happisburgh South landfall location shown in Figure 5.2, the proposed works are not adjacent to sea defences maintained by the Environment Agency and the boundary of the works are not within Flood Zone 2 or 3. On this basis, a Flood Risk Activity Permit will not be required for the works. We note that cable relay station and substations are located in flood zone 1 and so no further assessment of risk associated with tidal or fluvial	Potential impacts on flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>sources is required. Where access routes cross flood zones 2 and 3, they are proposed to replicate existing ground levels. Where the provision of an access road will result in the raising of ground levels, the impact upon flood risks in the local area/within the flood cell will need to be considered and compensated for appropriately. In this instance, modelling will need to be provided to demonstrate that there will be no increase in flood risk to the site and surrounding area.</p>	
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>42. Table 20.1 The Secretary of State asks that the Flood Risk Assessment should take into account the most up to date climate change allowances and should cover tidal flood risk as well as fluvial impacts under present and projected sea level scenarios.</p> <p>Comment: The consideration of 'short HDD' as an option for the landing at Happisburgh South makes it seem that this advice has yet to be factored in. A tidal surge on the east coast as severe as that of the 5th December 2013 on the north coast could impact on cable relay stations if HVAC transmission were to be used.</p>	<p>Potential impacts on flood risk are addressed in sections 20.7.3 and 20.7.4. A detailed Flood Risk Assessment is provided in Appendix 20.1. Embedded mitigation measures including the selection of HVDC technology and the long HDD option are discussed in section 20.7.1.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>75. Table 20.7. We note the geomorphological overview of the Rivers Bure and Wensum and associated water bodies; and at 76 that the water quality data of the surface water bodies identified predominantly good physicochemical and chemical quality conditions across the main surface water catchments.</p> <p>Comment: the exceptions on phosphate level, one from sewage effluent discharges (77), and the other from arable run-off (78) – however these problems are widespread, albeit at a lesser degree than those mentioned here.</p>	The information provided in section 20.6 is based on publicly available data and is intended to provide an overview of baseline conditions.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>88. Table 20.8, Mitigation measures embedded for water resources and flood risk. We note the ten mitigation factors listed.</p> <p>Comment: The greatest mitigation measure of all for all would be the use of HVDC power transmission rather than HVAC. Apart from not requiring cable relay stations (two with Vanguard and Boreas) the whole cabling would see a much reduced amount of soil to be excavated and stored and back-filled along the 60 km length. In addition, because of that, there will be a greater chance of monitoring the construction work and assess the degree to which the codes of practice and mitigation measures are complied with. We make also make some specific comment. On the drainage plan it is good to maintain the duration for which trenches remain open by installing ducts in short sections and re-filling on the completion of each section. It is not clear though how the drainage plan to minimise water in the cable trench and ensure ongoing drainage of surrounding land, how the water in general might be got away; nor where water does enter the trenches during installation, how this will be pumped via settling tanks or ponds to remove sediment and then be discharged into local ditches or drains via temporary interceptor drains. For trenched watercourse crossings the dams will be removed; but again, it is not clear on how the watercourse will be diverted and where; and what might happen in even a relatively minor rain event, such as dam failure and/or spill-over or failure in the diversion. Mention is made of the</p>	As described in Chapter 5 Project Description, the HVDC option has been selected. Impacts associated with this option are assessed in sections 20.7.3, 20.7.4 and 20.7.5. Further details of embedded mitigation measures are provided in section 20.7.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>use of existing tracks and roadways for access where needed. However, no mention is made of the running tracks and the soil compaction caused by repeated use by heavy vehicles, far greater than occurs in agriculture, where it is a major factor in arable run-off. Mobilisation areas will comprise hardstanding to prevent soil erosion and increased surface runoff; will hardstanding really help, it may well depend on the nature of the top soil and underlying subsoil. For surface water drainage systems the SuDS philosophy will be employed to limit runoff, where feasible, and how often will that be? Foul drainage will be collected through a mains connection to existing local authority sewer system if available, and for rural Norfolk again how often will that be? The alternative would be a septic tank located within the onshore project area.</p>	

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>89.This section establishes the Worst Case Scenario (WCS) for each key impact category and the construction scenario, as well as the particular design parameters (such as the maximum construction footprint at the landfall) that define the Rochdale Envelope.</p> <p>Comment: We finish where we began. The Worst Case Scenario is the use of HVAC instead of HVDC. However, this is 'lost' and not identified as such by the misuse of the Rochdale Envelope. This applies all along the cabling corridor. In our view this invalidates the process by which impact assessments are made and advantages and disadvantages are assessed as regards residents, farmers and wildlife. Further at Table 20.15, using HVAC and the WCS, the residual impact identified for water resources and flood risk on the various receptors is shown as 12 negligible and 17 minor, nothing even as moderate adverse. Nothing is significant in EIA terms, and at face value there would be no taking forward to the Environmental Statement. The same methodology brings the same sort of result in other topic areas.</p>	As described in Chapter 5 Project Description, the HVDC option has been selected. Impacts associated with this option are assessed in sections 20.7.3, 20.7.4 and 20.7.5.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>58. The onshore cable corridor crosses four main catchment river catchments. Some tributaries and wetland areas for each river are listed. For the River Bure the most notable tributary is King's Beck. The downstream reaches of the river have a range of wetland features, including Hoveton Great Broad and Marshes, Woodbastwick Fens and Marshes, Bure Marshes. The River Wensum and several of its tributaries would be crossed, most notably Wendling Beck and the Blackwater Drain. The River Wissey headwaters fall within the area for the Necton National Grid substation extension. The North Walsham and Dilham Canal is crossed at North Walsham (see 41 above; note also a leisure interest).</p> <p>Comment: The tributaries and wetlands listed above and others should be considered for a trenchless crossing to minimise the risk of silt entering the river systems, and not adding to the loading caused by arable run-off, a major problem for all rivers entering the Broads (Bure, Wensum and Ant). Those running into the Wensum have the additional issue is that the whole upper reach of the river is designated SAC.</p>	Trenchless techniques have been selected for the larger and most sensitive watercourses, as described alongside other embedded mitigation measures in section 20.7.1. Potential impacts resulting from watercourse crossings are assessed in section 20.7.3.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>59. The baseline hydrology is described in more detail in Chapter 20 Water Resources and Flood Risk, but we note Tables 19.10 and 19.13 which show the status of the Broadland Rivers Chalk and Crag groundwater body and that of the North Norfolk Chalk groundwater body.</p> <p>114. It is anticipated that surface watercourses are in hydraulic connectivity with groundwater contained within superficial deposits throughout the study area. The River Wensum is a chalk river that is designated as an SAC and SSSI and is therefore considered to have high sensitivity. Tributaries of the Wensum such as Wendling Beck and the Blackwater drain are also considered to have high sensitivity, on the basis of their direct connectivity with the main River Wensum, on their basis of their direct connectivity with the main River Wensum.</p> <p>Comment: A team at UEA shows that much of the silt getting into a river system does so in a heavy rain event; and that in a drainage ditch will move on in the next heavy rain event until it reaches the main river. As such ditches only periodically in hydraulic contact with the groundwater also pose a risk.</p>	<p>Embedded mitigation measures to prevent sediment entering the surface drainage network are described in detail in section 20.7.1. Potential impacts resulting from increases in sediment supply are assessed in section 20.7.3.2.</p>
Chapter 20 Water Resources and Flood Risk	CPRE	December 2017	<p>116. The overall impact on indirect or contamination of surface watercourse based on the situation which includes the integration of measures adopted in section 19.7.1 is considered to be minor adverse which is not significant in EIA terms.</p> <p>Comment: We consider there is a divergence between the theory and what happens on the</p>	<p>Embedded mitigation measures to prevent contaminants entering the surface drainage network are described in detail in section 20.7.1. Potential impacts resulting from increases in the supply of sediment and other contaminants are assessed in section 20.7.3 and 20.7.4.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			ground. As a marker consider the persistent and severe problems with agriculture and arable run-off, in spite of good practices ELS, etc. As well as the adverse impact on rivers, it can also result in flooding of property.	
Chapter 20 Water Resources and Flood Risk	Anglian Water	December 2017	In addition consideration should be given to whether there is a need for water and wastewater services both during construction and following construction.	The requirements for water and wastewater services has been clarified in section 20.7.1.
Chapter 20 Water Resources and Flood Risk	Anglian Water	December 2017	Anglian Water is responsible for managing the risks of flooding from surface water, foul water or combined water sewer systems. It is assumed that Cable Relay Site site does not include any existing sewers therefore the risk of sewer flooding is considered to be low. However, no reference is made to existing sewers within the onshore cable route.	The requirements for water and wastewater services has been clarified in section 20.7.1.
Chapter 20 Water Resources and Flood Risk	Anglian Water	December 2017	At this stage it is unclear whether there is a requirement for wastewater services for the above site. It is suggested that the Environmental Statement should include reference to the foul sewerage network and sewage treatment as well as the management of surface water management.	The requirements for water and wastewater services has been clarified in section 20.7.1.

Feedback related to Land Use and Agriculture (Chapter 21 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	East Ruston Parish Council	November 2017	The loss of land suggested in the PEIR only relates to the CRS compound and control building rather than the full area impacted. The temporary compound, planting and arrival of Boreas will mean that the farmer will lose 30 acres of high-grade farmland, and it will have a significant impact on access to other areas and the day to day running of the business.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.
Chapter 21 Land Use and Agriculture	CPRE	December 2017	There is an overwhelming case for HVDC to be taken as an embedded mitigation measure for the onshore transmission of electricity from landfall to the national grid. In many ways it has advantages over the use of HVAC, and for differing aspects this is widely recognised by residents, farmers and the interests of nature conservation.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.
Chapter 21 Land Use and Agriculture	Happisburgh Parish Council	September 2017	The Council will not accept AC as an option, and recommends only DC as a possibility on the basis that AC is simply too disruptive to the fragile land in the village.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	Oulton Parish Council	December 2017	<p>Potential Mobilisation area on land near Docking Farm.</p> <ul style="list-style-type: none"> • Consideration should be made regarding whether access to the site is suitable, as it would require HGV's to negotiate narrow country lanes with informal passing places. Possible conflict with year round use by agricultural vehicles, residents and other vehicles plus the possibility of cumulative impact from HGV's from Dong/Orsted Hornsea 3 project also accessing another potential compound on the old airfield at Oulton Street. • Impact of soil being returned to the trenches in the right order safe guarding future agricultural uses. 	<p>Potential impacts on soils are discussed in section 21.6.4 and 21.7.4.3. Handling and protection of soils will be managed through the Soil Management Plan, which has been produced and submitted alongside the DCO application.</p> <p>Embedded mitigation measures in relation to soils and drainage are considered in Table 21.14.</p>
Chapter 21 Land Use and Agriculture	ES Pipelines National Grid Cadent Gas Ltd	November/December 2017	<p>ES Pipelines Ltd may be affected by the proposed works in the area of Norfolk Vanguard Offshore Wind Farm. ES Pipelines Ltd has a low pressure gas main serving the area in question (Reference Norfolk Vanguard Offshore Wind Farm) at grid reference E587959, N309485 and security of supply is vitally important.</p> <p>As your plans for the proposed work develop you are required to keep ES Pipelines Ltd regularly updated about the extent and nature of your proposed works in order for us to fully establish whether any additional precautionary or diversionary works are necessary to protect our gas network.</p> <p>National Grid requests to be consulted at the earliest stages to ensure that the most appropriate protective provisions are included within the DCO application to safeguard the</p>	<p>Potential impacts to utilities are assessed in section 21.7.4.6, section 21.7.5.4 and are shown on Figure 21.5. All utilities owners that are potentially impacted by the project will be further consulted post-submission of the DCO and post-consent where necessary to ensure agreements are reached on the details of construction and operation of the project.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>integrity of our apparatus and to remove the requirement for objection.</p> <p>Where the Promoter intends to acquire land, extinguish rights, or interfere with any of Cadent's apparatus, Cadent will require appropriate protection and further discussion on the impact to its apparatus and rights including adequate Protective Provisions.</p>	
Chapter 21 Land Use and Agriculture	Royal Mail	December 2017	Vattenfall should confirm more precisely that it has the location of any post boxes or other apparatus / infrastructure in order that Royal Mail can check and confirm ownership (or otherwise).	Traffic flows have been assessed in Chapter 24 Traffic and Transport, and will provide potential impacts on the road network during construction and operation of the project.
Chapter 21 Land Use and Agriculture	NFU	December 2017	<p>AC v DC Cables</p> <p>We would like Vattenfall to keep the NFU and its members updated at all times as to the decision regarding HVDC or HVAC.</p>	<p>Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity.</p> <p>One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	NFU	December 2017	<p>Construction</p> <p>We understand that once a jointing pit has been established the cables will be pulled through and joined together and once jointed the ground above would be reinstated. A 100m sections may be carried out in one go but that the running track will remain in situ until all of the duct installation is complete. Further it is not clear as to whether if on commissioning there was a problem, would it be necessary for these sections to then have to be reopened?</p>	<p>Further details regarding construction can be found in Chapter 5 Project Description.</p>
Chapter 21 Land Use and Agriculture	NFU	December 2017	<p>Corridors</p> <p>Further justification is required as to why a 100m working corridor is required?</p>	<p>Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a 100m corridor. Under the HVDC technology, a working width of 45m is required to include a running track, cable trenches, topsoil storage and adequate separation distance between cables. An indicative cross section of the working width is provided in Chapter 5 Project Description.</p>
Chapter 21 Land Use and Agriculture	NFU	December 2017	<p>There are general concerns on how will the running track be built and will different methods to be discussed with farmers and landowners. Further will access be allowed along the running track or will this only be for construction traffic? How are contractors going to take access to the running track and that access point must be agreed with farmers and landowners. Further</p>	<p>Where land area is separated by the works, access for farm vehicles would be maintained where practicable, in consultation with individual landowners and occupiers. Where necessary, crossing points would be agreed prior to construction. Embedded mitigation in relation to farm traffic is included in Table 21.14. Chapter 5 Project Description and Chapter 24 Traffic and</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			how are farmers to access their land which has been severed by the working strip?	Transport provide further details on the construction methodology for accesses.
Chapter 21 Land Use and Agriculture	NFU	December 2017	The NFU would like to see that an agricultural liaison officer is appointed during construction and is available at all times during construction 24 hours a day and 7 days a week.	Details of embedded mitigation measures which include the provision of an Agricultural Liaison Officer can be found in Table 21.14.
Chapter 21 Land Use and Agriculture	NFU	December 2017	<p>The NFU would like to receive further information on the following:</p> <ul style="list-style-type: none"> • What is the intended permanent easement width, • Is an easement requested in perpetuity or time limited, • What restrictive covenants are to be put in place, • Is there to be a development clause. 	Details of the permanent easement can be found in Chapter 5 Project Description. A 20m permanent easement will be sought, and discussions had with landowners in relation to any restrictions on certain activities agreed.
Chapter 21 Land Use and Agriculture	Colby and Banningham Parish Council	December 2017	The use of HVDC cabling will minimise the area of land take for the cable corridor, as the width will be reduced, and the cabling quicker to lay and less intrusive.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid. Under the HVDC technology, a working width of 45m is required to include a running track, cable trenches, topsoil storage and adequate separation distance between cables. An indicative cross section of

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				the working width is provided in Chapter 5 Project Description.
Chapter 21 Land Use and Agriculture	Bidwells	December 2017	Clarification on the restrictions to be imposed on the use of the land within the easement strip is required.	Information can be found in Chapter 5 Project Description, however the permanent easement would seek to restrict activities which would penetrate the ground by more than 0.65m.
Chapter 21 Land Use and Agriculture	Bidwells	December 2017	Due to the increasing technology in agriculture, we require further details to justify the stated view that negligible impacts are predicted and to confirm it will not affect agricultural software. Could you confirm that there will be no effect on public health due to electromagnetic fields.	Norfolk Vanguard Limited is working closely with Ørsted regarding the crossing of the projects. A detailed study has been undertaken against government standards for potential EMF of both projects at the crossing point. The maximum EMF expected to be produced has been calculated as less than exposure limits. The crossing point is therefore compliant with UK EMF policy. This is detailed further, along with potential cumulative impacts on soils and agriculture, in Cumulative Impact Assessment (section 21.8).
Chapter 21 Land Use and Agriculture	Savills	December 2017	The locations of the link boxes are yet to be determined, however it is noted that every effort must be taken that the Scheme should avoid the unnecessary loss of agricultural land which means that these need to be sited in boundaries and hedgerows following discussions with the landowner.	The site selection process and embedded mitigation has aligned the onshore cable corridor with field boundaries where possible to minimise sterilisation of land parcels. Further detail can be found in Table 21.14 and in Chapter 4 Site Selection and Assessment of Alternatives.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	Savills	December 2017	<p>It has always been understood that access to the cable route would be obtained from the compounds/mobilisation zones which in turn would have been sited with suitable access to them so avoiding using the narrow country roads. Vattenfall confirmed that the side accesses were required to allow them to return and pull the cables through which would be at approximately 800 metre intervals. Clarification is needed. They were not intended to be used for duct installation process as the running track along the centre of the corridor will be used for the majority of the construction traffic. Many of the possible routes identified for access are wholly unsuitable. There have been no discussions or detail how landowners will be able to cross the working corridor to gain access to their other land if it has been land locked due to the presence of the corridor.</p>	<p>Further detail on access can be found in Chapter 5 Project Description and in Chapter 24 Traffic and Transport.</p>
Chapter 21 Land Use and Agriculture	Savills	December 2017	<p>There is considerable concern over EMF and the impact on health. The PEIR is unclear what mitigation Vattenfall will be undertaking due to the uncertainty on the appropriate policy. Further clarification needed. Greater detail is also required on potential interference on Soil Sense Technology, RTK and other agricultural software.</p>	<p>Norfolk Vanguard Limited is working closely with Ørsted regarding the crossing of the projects. A detailed study has been undertaken against government standards for potential EMF of both projects at the crossing point. The maximum EMF expected to be produced has been calculated as less than exposure limits. The crossing point is therefore compliant with UK EMF policy. This is detailed further, along with potential cumulative impacts on soils and agriculture, in Cumulative Impact Assessment (section 21.8).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	Savills	December 2017	Greater clarity is required on how the soils are to be treated, what is the weed control programme, how will the soils be stored, under what conditions will you undertake reinstatement, how do you propose to reinstate? What topographical and geological analysis will be undertaken?	The principles of a Soils Management Plan (SMP) are included in the Outline Code of Construction Practice (Document reference 8.1), which has been produced and submitted with the DCO application. Contractors must comply with the contents of the SMP during construction.
Chapter 21 Land Use and Agriculture	Savills	December 2017	There are a number of alternative routes that have been discussed with Vattenfall but do not appear to be included within the PEIR. There are also a number of amendments to the route within the PEIR which landowners have not been advised of.	Further information is provided in Chapter 4 Site Selection and Assessment of Alternatives.
Chapter 21 Land Use and Agriculture	Savills	December 2017	Recent field trials have shown that cereal crops have a root depth in excess of a metre. What will be the impact of the cables be on growing crops?	The permanent easement would seek to restrict activities which would penetrate the ground by more than 0.65m.
Chapter 21 Land Use and Agriculture	Savills	December 2017	Due to the diverse range of soil types confirmation is required that the land will be worked on in the appropriate conditions ie. working on heavier land in the Summer months and lighter land in Spring and Autumn. This will ensure that the land is reinstated and given the best opportunity to recover following the works.	The principles of a SMP are included in the Outline Code of Construction Practice (Document reference 8.1). Contractors must comply with the contents of the final SMP during construction. The duct installation strategy allows for the reinstatement of land following duct installation in 150m stretches, thereby minimising the time trenches are open. Chapter 5 Project Description provides more detail.
Chapter 21 Land Use and Agriculture	Savills	December 2017	The Running Track will be removed following the completion of the ducting, however it is noted that up to 20% of the route will not have the running track removed. Further details of these areas are required and what mitigation measures are proposed to reduce any issues in this regard.	Chapter 5 Project Description provides more detail, however In some locations, isolated sections of the running track will be left in place from the duct installation works or required to be reinstated to allow access to more remote joint locations.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	Savills	December 2017	The corridor will disrupt Dillington Hall Estate and Gorgate's Entry Level plus Higher Level Environmental Stewardship (HLS) Schemes. The PEIR covers the derogations needed with Natural England for these schemes to continue without financial penalty to both landowners. It does not address how future schemes will be treated if entry into them is prejudiced because of the ongoing Vanguard/Boreas route.	
Chapter 21 Land Use and Agriculture	Savills	December 2017	The PEIR states existing drains will be dammed or diverted. Blocking, pumping or quickly re-connecting existing ditches dissected by the scheme is vitally important during construction work to prevent the cable corridor becoming waterlogged and subsoils damaged. This includes field ditches and dykes that are seasonally wet, existing ponds and watercourses.	Table 21.14 and section 21.7.4.1 provide information on drainage mitigation measures.
Chapter 21 Land Use and Agriculture	Savills	December 2017	During wet periods, limiting mechanised soil handling where soils are highly vulnerable to compaction will prevent permanent damage to their structure. It would be beneficial to incorporate into the construction plan the avoidance of wintertime soil excavations on lowland marsh, clayey soil or poorer draining soils where a high water table might be present. These should perhaps be considered for spring and summertime excavation and drier soils dug during winter months.	The principles of a SMP are included in the Outline Code of Construction Practice (Document reference 8.1), detailing best practice during construction to protect the soil resource.
Chapter 21 Land Use and Agriculture	Savills	December 2017	How will fertility, biological activity and organic context be maintained or reinstated? Additionally, how will this be recorded, monitored and inspected by the land owner or their agent to	The principles of a SMP are included in the Outline Code of Construction Practice (Document reference 8.1), detailing best practice during construction to protect the soil resource.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			ensure these measures are actually undertaken to the required standard?	
Chapter 21 Land Use and Agriculture	Brown and Co	December 2017	<p>What methods will be used to ensure the subsoil is not damaged during installation?</p> <ul style="list-style-type: none"> • Will also soils be tested prior to works starting? • What methods will be deployed in the event of inundation with rainwater? • Will there be appropriate means to deal with large volumes of surface water ponding? • Will there be appropriate means to manage large volumes of water borne soil runoff? • What provisions will be made to source additional topsoil that is a close match to the destination land? 	The principles of a SMP are included in the Outline Code of Construction Practice (Document reference 8.1), detailing best practice during construction to protect the soil resource.
Chapter 21 Land Use and Agriculture	Brown and Co	December 2017	<p>Installation works will severely disrupt soil profiles with potential long-term impact o Will full soil profile surveys be carried out before works are undertaken?</p> <ul style="list-style-type: none"> • What is the proposed specification of soil surveys? 	The principles of a SMP are included in the Outline Code of Construction Practice (Document reference 8.1), detailing best practice during construction to protect the soil resource.
Chapter 21 Land Use and Agriculture	Brown and Co	December 2017	<p>Installation of cables will potentially disrupt in field drainage schemes. o Please confirm that full pre-scheme drainage investigations will take place?</p> <ul style="list-style-type: none"> • Landowners will in many cases wish to use their 'normal' drainage contractor to advise on and carry out remedial works. Please confirm that this will be acceptable? 	Table 21.14 and section 21.7.4.1 provide information on drainage mitigation measures

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 21 Land Use and Agriculture	Brown and Co	December 2017	<p>Many fields have services underground including water and electricity supplied o Will full pre-works surveys be carried out to establish the infrastructure that is in place?</p> <ul style="list-style-type: none"> • Can it be confirmed that any interruption to services and any associated losses incurred, if any, will be compensated at the time? 	Potential impacts to utilities are assessed in section 21.7.4.6, section 21.7.5.4 and are shown on Figure 21.6. A utilities search will be commissioned pre-construction to identify any utilities that may potentially be impacted by the project.
Chapter 21 Land Use and Agriculture	Brown and Co	December 2017	Where land is cut off and not viable to farm all lost crops or cropping opportunity must be compensated. Please confirm this?	Private agreements will be sought between Norfolk Vanguard Limited and relevant landowners/occupiers regarding any measures required in relation to crop loss incurred as a direct consequence of the construction phase of the project.
Chapter 21 Land Use and Agriculture	Brown and Co	December 2017	<p>It is important that Vattenfall carry out full soil surveys prior to entry to enable proper restoration to take place. Such tests should assess (as a minimum):</p> <ol style="list-style-type: none"> Mineral and Nutrient content Soil composition Pathogen content 	Mitigation in relation to soils and proposed pre-construction works is detailed in section 21.7.1.

Feedback related to Onshore Ecology (Chapter 22 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Breckland Council	November 2017	It is noted that an Outline Landscape Ecological Management Plan will be produced to accompany the Environmental Statement when the application is submitted. That will be crucial to understanding the mitigation and improvement measures that are required and further	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			assessment will be carried out by a specialist ecologist on behalf of the council during the consultation period for that.	
Chapter 22 Onshore Ecology	Environment Agency	November 2017	<p>Overall this is a thorough onshore Ecology report for the proposed Norfolk Vanguard Offshore Wind Farm Project (Chapter 22). It is acknowledged that some elements of the ecological survey data are not yet available, and that the details of the Outline Landscape Environmental Management Strategy [OLEMS] are not included.</p> <p>This operation will directly affect approximately 600ha of land, we would like to remind the applicant of their duty to protect and where possible to enhance the priority habitats and species likely to be impacted by this project in line with the UK Biodiversity Action Plan. We advise consultation with Natural England and Norfolk Wildlife Trust regarding impacts to designated sites. We would expect this project to aim towards no net loss of designated sites. Permanent loss is unacceptable.</p>	Protection of habitats and avoidance of designated sites are set out in sections 22.7 and 22.8 of this chapter.
Chapter 22 Onshore Ecology	Environment Agency	November 2017	22.7.3.4.3 Impact 4. Woodland trees and scrub: Point 282. We support the use of trenchless crossing techniques (HDD) for any area of mixed deciduous woodland. We would encourage the applicant to consider the potential for creating woodland corridors to increase habitat continuity and create net overall habitat gain. Woodland provides multiple benefits including an essential role in reducing flooding in	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			upper catchments and reducing soil erosion and sediment flow into watercourses.	
Chapter 22 Onshore Ecology	Environment Agency	November 2017	22.7.3.5.1 Impact 5. Hedgerows - Point 292. The Onshore Cable corridor (ONC) work stands to result in the loss of approximately 6.3 km of hedgerow, which is a viable area of UKHPI and Norfolk BAP habitat. Hedgerows are essential in reducing soil erosion, reducing sediment runoff and removal, even temporarily, will have adverse effects on nearby waterbodies. The proposal includes a replanting element, however we would expect a further survey to differentiate between species rich hedgerow (ancient hedgerow) and species poor hedgerow. Where ancient hedgerow is identified, we would support the use of HDD techniques. Further information on surveying hedgerows can be found through The Norfolk Wildlife Trust and Natural England.	Hedgerows have been surveyed to this level of detail during the Extended Phase 1 Habitat Survey. This information is presented in Appendix 22.1.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Environment Agency	November 2017	Impact 8 Water courses and ponds. 22.7.3.8.3 Point 314. Temporary loss of approximately 40 ponds. Section (22.7.3.13.4 – 388) – states that there will be permanent loss of up to 22 potential breeding ponds for Great Crested Newt (GCN). Within the EIA, this loss is classified as Major – High Magnitude, High importance, and Worse major impact. This loss of UKBAP priority habitat is unacceptable. Standing waterbodies are considered freshwater habitats under the WFD so as such the prevalence of the feature in the area does not lessen WFD obligations. We also note that at 22.7.3.13.4 Impact 13 the presence/ absence of GCN has not yet been established and that detailed mitigation strategy will be required. Further consideration for preserving these important features is required. We recommend the consideration of HDD for these features. The project should aim to ensure that there is no overall loss in the number of ponds.	The project will ensure no net loss of pond habitats. The number of ponds affected during construction has been reduced (originally 40 and now five ponds) through project design iterations. Impacts and proposed mitigation upon these ponds are set out in 22.7 and 22.8 of this chapter.
Chapter 22 Onshore Ecology	Environment Agency	November 2017	22.7.3.10.1 Impact 11 Water Vole: Extensive surveys carried out by a qualified ecologist at the optimal time of year will be required at all potential crossing sites These surveys will need to include IDB drains, field drains (where habitat is suitable), and all watercourses. A Water Vole mitigation plan for each area of suitable habitat will be required once the results of surveys are complete. We are fully in support of the use of HDD techniques where water voles are present.	Water vole surveys were undertaken in 2017 and these survey results are provided in Appendix 22.3. Impacts on water voles and the required mitigation measures is set out in sections 22.7 and 22.8 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Environment Agency	November 2017	Control measures for non-native and invasive species should be in place.	Mitigation measures to prevent the spread of invasive species is set out in sections 22.7 and 22.8 of this chapter.
Chapter 22 Onshore Ecology	Environment Agency	November 2017	Fish species - no assessment on bullhead, brown trout, brook lamprey (Annex II)	Data on these species has been provided by the Environment Agency and is included in section 22.6 of this chapter. Impacts on these species and any required mitigation measures is set out in sections 22.7 and 22.8 of this chapter.
Chapter 22 Onshore Ecology	Natural England	November 2017	Whilst it is recognised that the requirement to produce an ES is through the EIA regulations consideration of the habitat regulations should not be excluded from each of the chapters. For example when considering a designated site it is not appropriate to use the EIA matrices which are for wider environmental receptors rather than a protected feature. The conservation objectives for the site should be used to determine significance for protected sites. At the end of the chapter NE expects a set of conclusions for EIA Regulations identify any sensitive receptors which may require further consideration in pre- and post-construction monitoring and conclusions in relation to any Likely Significant Effect (LSE) for protected features that will be taken forwards into the RIAA. A table determining significance is in-sufficient as need to determine what outcome will be for the projects. NB: if there are residuals concerns that may/may not be significant these will require further consideration including monitoring.	The HRA Report provides a detailed consideration of the potential Likely Significant Effect (LSE) on the protected features (habitats and/or species) of European sites. The conclusions of the HRA Report are referenced within sections 22.7 and 22.8 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Natural England	November 2017	<p>In terms of the HRA, Natural England agrees that the River Wensum SAC, Great Paston Barn SAC and the Norfolk Valley Fens SAC are scoped in for further assessment. We are satisfied with the criteria for screening out Broadland SPA/Ramsar site. However, The Broads SAC needs to be included in the scoping exercise as this site appears to have been omitted from considerations.</p>	<p>Additional screening has been undertaken for The Broads SAC and is reported within the HRA Report and within sections 22.7 and 22.8 of this chapter. The Broads SAC was omitted from the previous HRA Screening Report as the 5km buffer used to screen in sites was defined primarily to capture bird and bat qualifying species travelling up to 5km from the site to forage etc, neither of which are qualifying features of The Broads SAC. This was not explained adequately within the HRA Screening Report</p>
Chapter 22 Onshore Ecology	Natural England	November 2017	<p>We note that survey data has not been provided for onshore ecological receptors and we are thus unable to provide detailed comments about the adequacy of the surveys and assess impacts at this stage. It is likely that a key impact may arise from changes to the hydrology of wetland sites, either directly or indirectly, during construction and operation.</p> <p>In addition to international features of River Wensum SAC and Norfolk Valley Fens SAC, the impacts on their component SSSI features should also be assessed in detail. It is likely that there will be an impact on bat species using Great Paston Barn SAC. Mitigation needs to be provided for impacts on foraging areas and commuting routes in advance of construction works taking place. There is unlikely to be an effect on the purposes of designation of the protected landscapes of the Broads National Park and Norfolk Coast AONB.</p>	<p>Mitigation for potential impacts upon these sites is reported within the HRA Report and within sections 22.7 and 22.8 of this chapter.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Natural England	November 2017	We welcome further discussions in relation to a wider strategic approach to GCN mitigation in line with Natural England's latest change in licensing advice as per discussions in July.	A meeting was held on 12 th March 2018 to discuss these opportunities. The option for using off-site mitigation for great crested newts has been retained by the project so that it can be potentially used during post-consent mitigation. A Draft Great Crested Newt Mitigation Licence has been submitted to Natural England containing details of these proposals.
Chapter 22 Onshore Ecology	Natural England	November 2017	The information contained in this section [Chapter 22 of the PEIR] is too general and non-specific to be able to make any detailed comments regarding the hydrological and ecological impacts of the proposal. There are no details of the surveys undertaken or the results so it is not possible to comment on their adequacy or otherwise. Impacts will need addressing with regard to the specific details of the nature, location and timing of the works and the mitigation. Without these, general statements around impact level are of limited value and it is not possible to comment on their validity.	At the time of issue of the PEIR, not all results from the species-specific surveys undertaken during 2017 were available. In these instances, the information presented in the PEIR used the findings from the Extended Phase 1 Habitat Survey only. All species-specific surveys are now completed and therefore their findings have been used to inform this EclA. Full baseline, impact assessment and proposed mitigation is presented sections 22.7 and 22.8 of this chapter.
Chapter 22 Onshore Ecology	Natural England	November 2017	An area of particular concern is the hydrological impact of the construction affecting ground and surface water flows. This will need to be assessed according to the specific hydrological regime at individual locations where there is habitat linked to and dependant on the water regime. Small scale local disruptions can significantly affect important habitats and communities such as seepages and springs. Sites where the cable is adjacent to the River Wensum before crossing and running along the Penny Spot Beck, Dillington, and other locations with a	These possible effects are considered within Chapter 19 Ground Conditions and Contamination. A summary of the potential impacts is provided in the HRA Report (with respect to the River Wensum) and within sections 22.7 and 22.8 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			wetland habitat component, will need detailed investigation.	
Chapter 22 Onshore Ecology	Natural England	November 2017	There is a requirement for a HDD methodology statement in order for adequate assessment of impacts.	Detailed methodologies for trenchless techniques are provided in Chapter 5 Project Description.
Chapter 22 Onshore Ecology	Natural England	November 2017	Bat emergence/re-entry and activity surveys need completing before we can make a detailed comment.	Results from the bat emergence / re-entry surveys are provided in Appendix 22.5 and the impacts are considered within sections 22.7 and 22.8 of this chapter.
Chapter 22 Onshore Ecology	Natural England	November 2017	Mitigation needs to be designed to account for impacts on bats, e.g. linear features need to be reinstated; hedges should be double-planted with grassland strips on both sides so there is always a leeward side to forage. Trees should be planted where possible as well as native shrubs.	Mitigation measures proposed for bats with respect to hedgerows are presented within sections 22.7 and 22.8 of this chapter and captured within the OLEMS.
Chapter 22 Onshore Ecology	Natural England	November 2017	Works will interrupt core bat foraging areas as well as commuting routes; mitigation should be in place for these. In order to be effective, the mitigation should be in place before the disruption works are carried out. Working on sensitive sections e.g. severing commuting routes, should ideally be carried out in winter, when the bats are dormant, so the bats can adapt to the change before the pupping season is underway.	Mitigation measures proposed for bats with respect to hedgerows are presented within sections 22.7 and 22.8 of this chapter and captured within the OLEMS.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	Ecologists from the Natural Environment Team at the County Council have attended a number of Ecology Expert Topic Group (ETG) meetings and have had the opportunity to comment on methodology and approaches for establishing and assessing the ecological situation. Officers consider the approach is acceptable. The results of many of the ecology field surveys are not presented in the PEIR and it is understood that the County Council will not see the survey results until the Environmental Statement is produced.	Survey results are represented in section 22.6 of this chapter and detailed in full in Appendices 22.1-22.9. These results were also presented in the January ETG meeting.
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	The County Council notes that an Outline Landscape Ecological Management Plan will be produced alongside the Environmental Statement at submission, and agree that this is the most appropriate way to address mitigation in relation to ecology.	Noted.
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	County Wildlife Site (CWS) The County Council notes the reference in the PEIR to CWSs potentially impacted by the onshore cable (Chapter 22: Section 22.7.3.2.3, p. 70). CWSs all have a unique reference number and it would be particularly helpful if the reference codes are used to identify sites. There may be some confusion as to why the sites are designated; of the sites that are mentioned in Paragraph 260, Paston Way and Knapton Cutting CWS (CWS No. 1175) is not designated for its wet woodland as stated, neither is the Marriott's Way (CWS No. 2176) designated as a 'green woodland corridor'.	Baseline information in section 22.6 of this chapter has been updated in light of these comments.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	Where CWS will be crossed by the cable corridor, the County Council would request that very strong consideration is given to using Horizontal Directional Drilling (HDD), particularly at Wendling Carr CWS 1013, which is associated with Wendling Beck. Paragraph 314 (p. 78) indicates that only one of the two crossings of Wendling Beck will be using trenchless techniques but it is unclear as to whether this will be at the CWS.	Following this comment, the project design has been revised and now trenchless techniques are proposed to be used at all identified CWS (a haul road is retained within one CWS at Wendling Carr).
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	The cable route runs parallel to the Marriott's Way CWS at several points and bisects it twice. Potential impacts on this site may therefore be cumulative. Cables for the DONG/Orsted 'Hornsea 3' offshore windfarm scheme also bisect the Marriott's Way in two places and so cumulative impacts may be more significant than implied, notably east of Reephham.	Consideration of cumulative effects are presented within section 22.8 of this chapter.
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	Protected Species and Habitats At the Onshore Ecology Expert Topic Group meetings, various issues with surveys for bats have been raised. The Norfolk Vanguard Ecological Surveys Interim Report (June 2017) concludes "For bat surveys there is a more significant issue. If continuing with the present methodology, gaining sufficient access is a significant constraint for spatial and temporal coverage of the study area" (paragraph 8.9). At this stage, the County Council retains reservations regarding the ability of the bat survey results to allow a robust and lawful decision to be reached.	Since this PEIR response, the Bat Activity Survey Report has been circulated for comment. Comments received are detailed later in this consultation table. Full details of the impacts on commuting / foraging bats is presented within sections 22.7 and 22.8 of this chapter

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	The Paston Great Barn Special Area of Conservation (SAC, a European site) is designated for its barbastelle bat breeding colony, and at this stage it is unclear as to whether the locations where bat surveys were undertaken were appropriate to assess the impacts on this feature of the SAC. The County Council welcomes that the project sought data from the Norfolk Barbastelle Study Group, particularly with regard to radio-tracking information. Where statements are made to specific ecological information (e.g. to barbastelle bat territorial ranges), they should be supported by a suitable peer-reviewed reference.	Since this PEIR response, the location of the bat surveys has been discussed at the project ETG meetings (see below). Full details of the impacts on commuting / foraging bats of the Paston Great Barn Colony is presented within sections 22.7 and 22.8 of this chapter
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	The County Council notes that the PEIR refers to surveys for the Norfolk Hawker dragonfly (e.g. paragraph 182 and subsequently). As County Council officers have previously mentioned at the ETG meetings, surveys for adult dragonflies will not provide confirmation of breeding. Criteria for establishing proof of breeding have been defined by the British Dragonfly Society.	As a result of evolution of the project design, areas of suitable habitat for Norfolk hawker dragonfly will no longer be affected by the project. No further surveys are proposed post-consent.
Chapter 22 Onshore Ecology	Norfolk County Council	November 2017	Loss of Ponds In Chapter 22: section 22.7.3.8.3 (Paragraph 314) it states "The cable route works will result in a temporary loss of approximately 40 ponds (approximately 0.4ha) during the cable ducting element of the construction phase (approximately two years) and for a further 16 weeks during the three year cable pull element of the construction phase." The County Council is unclear what the 'temporary loss' means in this context.	The potential impacts on ponds during construction is presented and the term 'temporary loss' explained within sections 22.7 and 22.8 of this chapter. Due to route refinements, only 5 ponds are now directly affected.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	<p>The District Council welcomes the commitment by Vattenfall to undertake trenchless crossing points (HDD) at roads, railways and sensitive habitats. However, it is suggested that additional HDD points will be required to miss further sensitive habitats and areas where significant/important hedgerows and hedgerow trees will otherwise need to be removed. For example:</p> <ul style="list-style-type: none"> · West of The Street, Ridlington (TG 34631 30520) – an area of former grazing pasture and a large ditch network (currently unsurveyed) · Paston Way cutting (County Wildlife Site) (TG 28631 31559) which links with Pigneys Wood Local Nature Reserve (also option to HDD under B1145 North Walsham Bypass and burial ground) – Paston Way is a former railway cutting which would require a deep excavated trench to get to the required levels beneath the cutting, plus contaminated land issues 	<p>Following refinement of the onshore project area, Paston Way Cutting CWS is now proposed to be crossed using trenchless techniques. Undesignated habitat at Ridlington Street is proposed to be crossed using trenching. Impacts upon the habitats and potential species at the habitat by Ridlington Street are presented within sections 22.7 and 22.8 of this chapter.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	<p>Due to the lack of horizontal directional drilling (HDD) there would appear to be the need to remove a significant number of hedgerows, and hedgerows with mature trees. The majority of the 310 hedgerows identified were species-rich intact hedgerows with trees (89 in total). The PEIR does not highlight which of the hedgerows surveyed are important hedgerows under the Hedgerow Regulations 1997. Furthermore, there are many more boundary features that have not been able to be surveyed due to lack of access, some of which are important landscape features e.g. north of Lyngate (TG 27603 31809). The District Council recommends that further work needs to be undertaken by Vattenfall to identify those hedgerows/field boundaries that would benefit from trenchless techniques to ensure that these important ecological and landscape features can be retained. This is critical as compensatory planting will not be able to include replacement trees over the buried cable routes.</p>	Identification of important hedgerows is provided in in section 22.6 of this chapter.
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	<p>West of The Street, Ridlington (TG 34631 30520) – This area does not appear to have been surveyed in the field as part of the Water Vole, Breeding Birds or Extended Phase 1 survey, yet appears to be existing or former grazing pasture with possible reasonable habitat (semi-improved) and has an extensive ditch network and defined historical field pattern.</p>	Access was not available to survey these areas at this time due to lack of access permission. Surveys will be required for these habitats prior to any work commencing.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	Ancient Woodland – there does not appear to be any mention of Ancient Woodland within the habitat or designated sites section of Appendix 22.1 (Extended Phase 1 Habitat Survey Report), although there are Ancient Woodland sites (or replanted AW sites) adjacent or near to the cable corridor. Have impacts on these designated sites been scoped out of the report?	Ancient woodlands have been considered within sections 22.7 and 22.8 of this chapter. All ancient woodlands have been avoided during the refinement of the onshore project area either through route refinement or through use of trenchless techniques.
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	Welcome the commitment to reduce the working width of the cable corridor to 54m (HVAC) at unavoidable hedgerow crossings – however further input is desirable into which hedgerows will need to be removed.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a decisions in relation to the project design to deploy High Voltage Direct Current (HVDC) cable technology to the UK’s National Grid and this removes the need for a 100m corridor. The hedgerows to be removed will be detailed in section 22.6 of this chapter.
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	Phase 2 Bat Surveys – there appears to be some discrepancies between the classification of the bat features in the table of Annex D of Appendix 22.1 (Extended Phase 1 Habitat Survey Report) and Figure 4 of Appendix 22.1, with features with bat interest labelled as ‘moderate’ on the maps (figure 4) but as ‘low’ on the table, e.g. Bat Reference Feature 146, 148 and 235 (for example). It is not clear therefore whether these features have been scoped into the Phase 2 activity surveys for bats. This is particularly important for features around Paston Barn, Edingthorpe and Bacton Woods. Furthermore, it is not clear from the maps provided in Annex A, Figure 4, where the linear features of low, moderate and high suitability for commuting and	All identified data discrepancies have been checked to ensure that there are no errors in the data presented in the report. Any errata (such as these) have been noted and presented in section 22.6 of this chapter. The process for classifying features of suitability to support commuting or foraging bats is set out in section 22.6 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			foraging bats are, and which of these have been included in the Phase 2 activity surveys.	
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	There could be significant limitations to the bat activity surveys as a result of the lack of access to identified areas with suitability for commuting and foraging bats and also due to missing out key commuting routes from Paston barn. The bat activity survey report and the survey methodology in the vicinity of Paston Barn, Edingthorpe and Bacton (Witton) Woods should make reference to the existing radio tracking data for the Paston barn colony undertaken by the Norfolk Barbastelle Study Group to justify where surveys have or have not been carried out and if not, why not. Further consideration needs to be given to the cable corridor north of Bacton Woods as possible further survey work may need to be carried out. The Paston bat colony are known to commute to and forage in the woods accessing the woods from the north and Edingthorpe. To date there is no information on the impacts of the cable construction on the commuting patterns of the Paston barn bats.	The Norfolk Barbastelle Study Group (NBSG) data has been used alongside the 2017 bat activity data to draw conclusions on the importance of key commuting routes to the Paston Great Barn colony. Details of the assessment of the impact on commuting / foraging bats of the Paston Great Barn colony is presented in the HRA Report and summarised in sections 22.7 and 22.8 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	Acknowledge that the cable corridor is currently defined as 200m wide which will be refined to allow the actual 100m wide cable route to be located in such a way to avoid sensitive features such as mature trees and take into account land owner preferences etc. It is not however clarified whether landowner preferences will override the requirement to avoid sensitive ecological features. A balance will be required to take into account the sensitivity of potential features and landowner preferences.	Noted.
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	General concern that only 50% of the cable route has been surveyed in the field, which could mean that many important ecological features may have been missed	This is related to landowner access provision. The areas not surveyed prior to submission will be surveyed post-consent. Further information is provided in section 22.5.3.
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	Unable to comment on the results of many of the ecological surveys as the results have yet to be inputted into the PIER report.	All species-specific surveys have now been completed and the results of which are presented in section 22.6 of this chapter and detailed in full in Appendices 22.1-22.9.
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	In terms of long term and permanent effects on the landscape, there will be a need to provide appropriate landscape mitigation particularly where open cut trenches affect field boundaries and landscape features such as mature trees. Vattenfall has indicated they will seek to do this but this would need to be set out within the mitigation strategy. Where possible, the District Council would expect Horizontal Directional Drilling (HDD) to be used if routes through sensitive woodlands or landscapes cannot be avoided.	Woodlands have been avoided by the project during the design process. Mitigation for locations where hedgerow removal is required is presented in sections 22.7 and 22.8 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	North Norfolk District Council	November 2017	In terms of delivering wider public benefits, there may be opportunities for Vattenfall to fund wider landscape mitigation to repair historical damage to field boundaries resulting from modern agricultural practices and to enhance local landscape character. This would also have the added benefit of helping improve biodiversity. Wider landscape enhancement could also improve the quality of walking and cycling opportunities in the countryside and enhance tourism to the benefit of the wider economy.	Landscape-scale habitat connection is considered within the landscape proposals in Chapter 29 Landscape and Visual Impact Assessment.
Chapter 22 Onshore Ecology	The Wildlife Trusts	November 2017	We are pleased to see that the cable routes have been refined so that there are now fewer areas remaining with a choice of routes. In general, our comments on the onshore ecology section of the PEIR are made in relation to designated sites and habitats and not necessarily on impacts on each individual receptor, owing to the fact that much work still needs to be done to further refine routes and assess the best mitigation measures for each area of ecological value. We note with regard to species data that ecological information is at an early stage and that sufficient information may not be currently available to allow a planning decision to be made. We would expect that this information will be presented at the submission stage.	Noted. Some ecological baseline information was not available at time of submitting the PEIR. This has subsequently been discussed with The Wildlife Trusts as part of the Onshore Ecology ETG meetings under the Evidence Plan Process in January 2018 and will be included in the final ES. This information is used to inform appropriate mitigation measures.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	The Wildlife Trusts	November 2017	We are concerned that DEFRA Local Wildlife Sites (known as County Wildlife Sites (CWS) in Norfolk) were not included from the outset, (along with nationally designated sites), as sites where impacts are to be avoided, as set out in paragraph 22.7.1.1.1. Although the whole project is a development of national significance, in our view, the exact location of cable routes should be viewed as being of local significance and Local Wildlife Sites should be accorded a similar level of priority as they are given in local authority Local Plans, where policies prioritise avoidance of impacts.	Following this comment, the project design has been revised and now trenchless techniques are proposed to be used at all identified CWS.
Chapter 22 Onshore Ecology	The Wildlife Trusts	November 2017	We are concerned that HDD isn't generally proposed for CWS and is only proposed for a small number of watercourses that have a national designation (para 22.7.1.3.2.) This is a particular concern for Wendling Carr (CWS 1013) and Land South of Dillington Carr (CWS 1025), plus the potential CWS at Kerdiston Meadows (paragraph 22.7.3.2.3). Without mitigation damage is assessed at the two CWS. At Wendling Carr, the receptor includes both a watercourse (Wendling Brook) and associated wetland habitat on the CWS. In our view HDD should be the preferred option at this location. For Land to South of Dillington Carr (CWS 1025) consideration should be given to ensuring that the final route follows the southern side of the wider corridor envelope, in order to avoid impacting the CWS.	Following this comment, the project design has been revised and now trenchless techniques are proposed to be used at all CWS.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	The Wildlife Trusts	November 2017	The cable route passes very close to Pigney's Wood LNR (and proposed CWS) and crosses the Dilham Canal and associated areas of wetland. No direct or indirect impacts on Pigney's Wood have been identified. Land adjacent to the wood and along the Dilham Canal consists of wetland habitats, which along with the canal are likely to be of CWS value. We are pleased to see that HDD is considered for Dilham Canal and associated habitats in the vicinity of Pigney's Wood and we support this option.	Noted.
Chapter 22 Onshore Ecology	The Wildlife Trusts	November 2017	Mitigation for loss of hedges (22.7.3.5) during construction needs to account of the fact that for some stretches the loss of hedge before replanting will stretch over a number of years. Section 22.7.3.8 states that "The cable route works will result in a temporary loss of approximately 40 ponds (approximately 0.4ha) during the cable ducting element of the construction phase (approximately two years) and for a further 16 weeks during the three year cable pull element of the construction phase. We are uncertain what is meant by temporary loss, as if the cable route crosses a pond it is unlikely to be possible to re-instate the feature. Wording needs to be clarified in relation to this issue. The impact of any loss of ponds needs to be linked with information from great-crested newt surveys.	The potential impacts on ponds during construction is presented and the term 'temporary loss' explained within sections 22.7 and 22.8 of this chapter.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 22 Onshore Ecology	The Wildlife Trusts	November 2017	HDD is only preferred at a small number of designated watercourses and the PEIR makes the assessment that “Given the extent of these habitats within the wider environment, this effect is anticipated to be of low magnitude.” (para 22.7.3.8.3). In our view HDD should be the preferred option at the great majority of watercourses and wetland habitats adjacent to watercourses. This will not only serve to give direct protection to habitats but will mitigate for potential impacts of pollution and silt run-off, whilst also improving biosecurity.	Impacts to watercourses is set out in Chapter 20 Water Resources and Flood Risk and summarised in sections 22.7 and 22.8 of this chapter.

Feedback related to Onshore Ornithology (Chapter 23 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 23 Onshore Ornithology	Natural England	November 2017	In terms of the HRA [Habitat Regulations Assessment]...We are satisfied with the criteria for screening out Broadland SPA/Ramsar site.	No action required.
Chapter 23 Onshore Ornithology	Natural England	November 2017	Around the River Wensum crossing, and other areas, the timing of the work will be important in relation to disturbance of breeding or wintering birds.	Mitigation around the timing of the works to avoid sensitive periods for birds has been considered. Mitigation for potential impacts on birds is presented in sections 23.7 and 23.8 of Chapter 23 Onshore Ornithology.
Chapter 23 Onshore Ornithology	Norfolk County Council	November 2017	Ecologists from the Natural Environment Team at the County Council have attended a number of Ecology Expert Topic Group (ETG) meetings and have had the opportunity to comment on methodology and approaches for establishing and	Survey results are presented in section 23.6 of this chapter and detailed in full in Appendices 23.2 and 23.4.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>assessing the ecological situation. Officers consider the approach is acceptable. The results of many of the ecology field surveys are not presented in the PEIR and it is understood that the County Council will not see the survey results until the Environmental Statement is produced.</p>	
<p>Chapter 23 Onshore Ornithology</p>	<p>RSPB</p>	<p>November 2017</p>	<p>We note that the eastern section of the onshore cable route falls within land identified by Natural England as functionally-linked to the Broadland SPA for foraging pink-footed geese. While limited evidence of foraging pink-footed geese was recorded on the site surveys, given the known importance of this area for the species, we consider that mitigation measures should be included within the Outline Landscape and Environmental Management Strategy (OLEMS). These should include measures to ensure that any mitigation planned to deter breeding birds from using the area surrounding the cable route does not adversely affect pink-footed geese by reducing availability of foraging habitat. In order to ensure that sufficient habitat is available in the wider area during construction, it may be beneficial to secure appropriate cropping outside the area directly affected by the works, to act as a refuge.</p>	<p>Mitigation for potential impacts upon pink-footed geese is presented in sections 23.7 and 23.8 of Chapter 23 Onshore Ornithology.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 23 Onshore Ornithology	The Wildlife Trusts	November 2017	We are pleased to see that the cable routes have been refined so that there are now fewer areas remaining with a choice of routes. In general, our comments on the onshore ecology section of the PEIR are made in relation to designated sites and habitats and not necessarily on impacts on each individual receptor, owing to the fact that much work still needs to be done to further refine routes and assess the best mitigation measures for each area of ecological value. We note with regard to species data that ecological information is at an early stage and that sufficient information may not be currently available to allow a planning decision to be made. We would expect that this information will be presented at the submission stage.	No action required.
Chapter 23 Onshore Ornithology	North Norfolk District Council	November 2017	West of The Street, Ridlington (TG 34631 30520) – This area does not appear to have been surveyed in the field as part of the Water Vole, Breeding Birds or Extended Phase 1 survey, yet appears to be existing or former grazing pasture with possible reasonable habitat (semi-improved) and has an extensive ditch network and defined historical field pattern.	Undesignated habitat at Ridlington Street is proposed to be crossed using trenching. Impact upon the potential bird species at the habitat by Ridlington Street are presented within sections 23.7 and 23.8 of Chapter 23 Onshore Ornithology.
Chapter 23 Onshore Ornithology	North Norfolk District Council	November 2017	Breeding Birds Surveys – It is not clear within the reports if all features suitable to support breeding birds have been surveyed e.g. hedgerows and areas of scrub, semi-improved grassland. It appears that only the larger areas of habitat capable of supporting breeding birds have been subject to a BBS. This needs to be clarified.	All features capable of supporting breeding birds have not been surveyed. The bird surveys completed to date have focused on key sensitive areas . Mitigation for common breeding birds using these habitats is provided in sections 23.7 and 23.8 of Chapter 23 Onshore Ornithology.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 23 Onshore Ornithology	North Norfolk District Council	November 2017	Unable to comment on the results of many of the ecological surveys as the results have yet to be inputted into the PIER report.	Survey results are presented in section 23.6 of this chapter and detailed in full in Appendices 23.2 and 23.4.

Feedback related to Traffic and Transport (Chapter 24 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 24 Traffic and Transport	Highways England	4th December 2017	Link Sensitivity – concerns raised for the sensitivity of Links 64 and 65 in which it is proposed that they are to be taken forward for further assessment.	Links 64 and 65 have now been assessed as ‘medium’ sensitivity in Table 24.9. Both links taken forward for further assessment .
Chapter 24 Traffic and Transport	Highways England	4th December 2017	Trip Estimation - HE suggested the adoption of the latest version of TEMPro in the estimation of the background flows.	TEMpro (version 7.2) utilised to derive growth factors.
Chapter 24 Traffic and Transport	Highways England	4th December 2017	Road Safety - HE recommended a contingency for mitigation at collision cluster site 12 should be considered in the event of the A47 Blofield to North Burlingham RIS scheme being delayed.	Section 24.7.7.3.3 discusses mitigation proposals for cluster 12 in the event that the proposed Road Investment Strategy (RIS) scheme is delayed.
Chapter 24 Traffic and Transport	Highways England	4th December 2017	Junction Capacity – It is advised that junction capacity assessments may be considered for Junctions 1 (Gapton) and 2 (Vauxhall) in the event of the RIS construction programme being delayed.	Section 24.7.7.4.1 and 24.7.7.4.2 details a proportional approach to assessing capacity on Junction 1 and 2 in the event that the RIS schemes are delayed.
Chapter 24 Traffic and Transport	Highways England	4th December 2017	Concerns raised relating to the substation access and cable crossing on the A47.	An OAMP (document reference 8.10) has been submitted with the DCO application which provides details of the proposed access arrangements.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 24 Traffic and Transport	Norfolk County Council	November 2017	The formal planning application, when submitted, must be accompanied by a Transport Assessment (TA). The TA will assess the effects of the anticipated traffic upon driver delay; severance; pedestrian delay; pedestrian amenity; accidents; road safety; and impact from abnormal loads. Development Consent Order (DCO) requirements will also have commitments to agree a Traffic Management Plan (TMP), which will initially be submitted in outline, then completed and agreed when the contractor is appointed.	The Transport Assessment is contained within the ES. An OAMP (document reference 8.10) and OTMP (document reference 8.8) have been provided in support of the DCO application.
Chapter 24 Traffic and Transport	Norfolk County Council	November 2017	An onshore substation will be required. The intention is to extend the Necton substation in an east west direction with vehicular access provided from the A47(T). Traffic assessments for the A47(T) are issues for Highways England to comment upon and not the County Council. Nevertheless, the County Council has expressed concern with regard to the proposed access arrangements and has suggested that as a minimum, a full right turn lane be provided from the A47(T). An alternative access strategy from the A47(T) has also been proposed by the applicant, however the County Council has again raised safety concerns. Ultimately, access to the A47(T) for the proposed new substation is a matter for Highways England to assess and the County Council can only inform them of our concerns.	Following consultation with highway stakeholders, a technical note was produced which identified preferred access options based on an evaluation of road safety and environmental impact. The note was circulated to stakeholders and is presented in Appendix 24.21.
Chapter 24 Traffic and Transport	Norfolk County Council	November 2017	Vattenfall should work closely with Highways England and Norfolk County Council (Highway Authority) to ensure the proposed cable route	Norfolk Vanguard Limited will work with HE and NCC Highways to ensure that the proposed cable works include suitable provision for existing or approved road developments.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			does not fetter any future plans for the dualling of the A47(T)	
Chapter 24 Traffic and Transport	Norfolk County Council	November 2017	Vattenfall should ensure that the proposed underground cable route does not fetter any future highway improvement schemes in Norfolk and that where any reinforcement or diversion is needed to the cable route as a result of such highway works, that Vattenfall will be responsible for any upgrades or diversion of the cables and will fully meet the costs of these works.	Norfolk Vanguard Limited will work with HE and NCC Highways to ensure that the proposed cable works include suitable provision for existing or approved road developments .
Chapter 24 Traffic and Transport	Breckland Council	November 2017	The prolonged period of construction will have the biggest impact in terms of the local road network. This will be created by the movements of vehicles transporting materials and removing spoil for the trenches. A fully detailed Transport Assessment and a Construction Traffic Management Plan must clarify the precise implications of the development and propose an appropriate package of management and mitigation measures together with improvements to be made to the local road network at the Applicant's expense.	The Transport Assessment is contained within the ES including proposals for any required mitigations. An OAMP (document reference 8.10) and OTMP (document reference 8.8) have been provided in support of the DCO application.
Chapter 24 Traffic and Transport	Breckland Council	November 2017	Breckland Council fully supports the highway views set out by Norfolk County Council in the response to this consultation. The request for a full right turn lane to be provided from the A47(T) into the area of the extended Necton substation is hereby reiterated. The District Council also shares the view that all major road scheme possibilities, including dualling of the A47, should remain unfettered. Highways England must be fully	Following consultation with highway stakeholders, a technical note was produced which identified preferred access options based on an evaluation of road safety and environmental impact. The note was circulated to stakeholders and is presented in Appendix 24.21.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			consulted and have no objections to the development.	
Chapter 24 Traffic and Transport	North Norfolk District Council	November 2017	The District Council recognises that the majority of traffic movements associated with the proposal will occur during the construction phase and would expect Vattenfall to work with the District Council, the Highway Authority and local communities affected to seek to minimise any adverse impacts through appropriate mitigation strategies.	Traffic derivation is discussed in section 24.6.6 including any proposed mitigation strategies.
Chapter 24 Traffic and Transport	Necton Parish Council	November 2017	Whilst the PEIR identifies entrances to the proposed sites further east of the Necton junction, the consequential impact of increased traffic, wide-load maneuverers and traffic-flow restrictions for proposed new right-hand filter lanes will cause long-term disruption for residents and local businesses.	Following consultation with highway stakeholders, a technical note was produced which identified preferred access options based on an evaluation of road safety and environmental impact. The note was circulated to stakeholders and is presented in Appendix 24.21.
Chapter 24 Traffic and Transport	Necton Parish Council	November 2017	There is insufficient analysis of the potential impact of traffic to inform our view on this proposal at present. A Transport Assessment and a Construction Traffic Management Plan will form part of the application. The PINS Scoping Opinion (para 3.169) has highlighted our comments with regard to a TMP. Given the impact poor traffic management along the A47 would have on residents of Necton, we would expect to be invited by Vattenfall to form part of a consultation group focusing on this subject.	The Transport Assessment is contained within the ES including proposals for any required mitigations. An OAMP (document reference 8.10) and OTMP (document reference 8.8) have been provided in association with the DCO application. Norfolk Vanguard Limited will work with Necton Parish Council post-consent, to set up a suitably constituted 'advisory group' or similar. This group will enable the views, concerns and ideas of local residents to be fed into Norfolk Vanguard Limited ongoing planning activities, and into effective management processes during the construction phase.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 24 Traffic and Transport	Necton Parish Council	November 2017	With regard to the strategic development plan for the A47 Necton area, this Council has commenced discussions with Highways England on safety improvement measures. Highways England has commissioned a survey that is expected to be complete by summer 2018. Vattenfall accepted an invitation to engage in these discussions, which commenced in September 2017 and we would expect they would continue to contribute to this process.	See above response.
Chapter 24 Traffic and Transport	Suffield Parish Council	November 2017	Assurance required that site vehicles would adhere to proposed trackway.	The OTMP (document reference 8.8) that supports the DCO application contains a commitment to monitoring and enforcing HGV movements
Chapter 24 Traffic and Transport	Suffield Parish Council	November 2017	The proposed mobilisation zone on land between Rectory Road and Felmingham Road. In all literature from Vattenfall it is stated that their aim is the least possible environmental impact from their scheme. Putting a mobilisation zone in Suffield would be totally against this stated aim. The area of Suffield is a deeply rural one with a narrow single track road with blind bends, no street lights and very little traffic.... There are two zones earmarked, one on the A140 and one in North Walsham both of which are in 'blighted' areas with traffic, lighting etc. It is therefore quite unnecessary to inflict such a heavy toll on such a rural area.	Revised project proposals do not include the requirement for a mobilisation area in the vicinity of Suffield.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 24 Traffic and Transport	Colby and Banningham Parish Council	November 2017	<p>The Primary Mobilisation Area proposed for Rectory Road, Suffield. It is noted that this will be a congregation area for HGV's, contractor vehicles and personal vehicles, with 240 people working there each day. With no restrictions on hours of operation, and peak hours from 7a.m. to 7p.m. 7 days a week, there will not only be significant adverse implications on our residents in respect of noise and air quality, but the area of major concern is the traffic movements. There is not precise data included in the PEIR as to what this will mean for Colby and Banningham, but according to the proposals in the documents 80% of construction movements will be along unclassified roads and 20% along specially constructed new routes. In our villages with narrow roads, no footpaths and a great deal of – necessary – agricultural vehicle movements, this will be totally unacceptable bearing in mind the nature of the plant, equipment and materials that will need to be transported. The access routes via Highbury Farm and Banningham Hall will create additional pressures for Colby Road and Church Road, the former especially narrow and on a bend at this point. Bridge Road and Colby Corner should be avoided altogether due to its insufficient width for heavy vehicles – it is already signed as “unsuitable for HGV's” and the proximity of Colby Primary School and the traffic generated at the start and end of the school day.</p>	Revised project proposals do not include the requirement for a mobilisation area in the vicinity of Suffield.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 24 Traffic and Transport	Colby and Banningham Parish Council	November 2017	Similar comments apply to the Primary Mobilisation Area, at the junction of the A140/B1145. However, the parish council's main comment on this area is that the site is totally unsuited to this use. The junction has been a cause of concern to both our council and Aylsham Town Council for a number of years, it has a bad accident record and the approach off the A140 is narrow and dangerous. The B1134 at this point is not technically wide enough for white lines along the middle of the road, although these do exist. Heavy vehicles turning off the A140 have to use the whole width of the road –if there is approaching traffic, the vehicles are forced to wait, sometimes with the rear sticking out on to the A140.	An OAMP (document reference 8.10) and OTMP (document reference 8.8) have been provided in support of the DCO application. These documents contain a commitment to assessing the manoeuvrability of the types of vehicle that would utilise the A140/B1145 junction and to mitigate this as appropriate.
Chapter 24 Traffic and Transport	Oulton Parish Council	November 2017	Consideration should be made regarding whether access to the site [MA7] is suitable, as it would require HGV's to negotiate narrow country lanes with informal passing places. Possible conflict with year round use by agricultural vehicles, residents and other vehicles plus the possibility of cumulative impact from HGV's from Dong/Orsted Hornsea 3 project also accessing another potential compound on the old airfield at Oulton Street.	All routes proposed have been subject to a detailed desktop assessment augmented by site visits to validate OS data. An OAMP (document reference 8.10) and OTMP (document reference 8.8) have been provided in support of the DCO application which contain more detail of the measures proposed to manage access via narrow routes. Norfolk Vanguard Limited are in dialogue with Orsted with regard to coordinating traffic demand.
Chapter 24 Traffic and Transport	East Ruston Parish Council	November 2017	The proposed development site at 6a is over 600metres away from any usable road (B1159) extending to 700 metres to reach the temporary compound (and eventually the Boreas site) and beyond to follow the cable route. Development at this site will therefore necessitate additional road building, creating noise and disruption –as	Norfolk Vanguard Limited has reviewed consultation received and revised proposals to now commit and deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station (CRS) (all options including at site 6a) from the project.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			well as further permanent loss of valued countryside. At present the location of this new road is unclear and we do not feel in a position to fully understand the likely impact or comment thereon.	
Chapter 24 Traffic and Transport	East Ruston Parish Council	November 2017	Presence would increase local traffic in the area to unacceptable levels which would subsequently impact surrounding villages and towns and cause diversion into quiet lanes which are not suitable for heavy or high volume traffic.	
Chapter 24 Traffic and Transport	Public Health	November 2017	We note that the submitted reports do not identify any significant risks to public health. However, traffic movements associated with the onshore activities (construction) of the development may generate localised dust emissions leading to potential complaints. Any issues raised by local communities need efficient management during the development phase.	An OTMP (document reference 8.8) has been provided in support of the DCO application. This document contains the measures for the day to day management of the project's HGV traffic including dust suppression. Public health is considered within Chapter 27 Human Health. Dust emissions are considered within Chapter 26 Air Quality.
Chapter 24 Traffic and Transport	Royal Mail	November 2017	Royal Mail requests that the ES to be submitted with Vattenfall's DCO application includes information on the needs of major road users (such as Royal Mail) and acknowledges the requirement to ensure that major road users are not disrupted though full consultation at the appropriate time in the DCO and development process.	An OTMP (document reference 8.8) has been provided in support of the DCO application. This document contains the measures for the day to day management of the project's HGV traffic to minimise the impact on all highway users.
Chapter 24 Traffic and Transport	Aylsham Town Council	November 2017	The areas that concern the Town Council most are where it crosses the A140 and Blickling Road. These are very important and busy roads for Aylsham, especially the A140. Any mitigation of road disturbance would be welcomed.	An OTMP (document reference 8.8) has been provided in support of the DCO application. This document contains the measures for the day to day management of the project's HGV traffic to minimise the impact on all highway users

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 24 Traffic and Transport	No to Relay Sattions (N2RS)	November 2017	Massive increase in road traffic, disrupting daily life and forcing traffic into single track lanes.	Norfolk Vanguard Limited has reviewed consultation received and revised proposals to now commit and deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

Feedback related to Air Quality (Chapter 26 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant
Chapter 26 Air Quality	Colby and Banningham Parish Council	December 2017	The Primary Mobilisation Area proposed for Rectory Road, Suffield. It is noted that this will be a congregation area for HGV's, contractor vehicles and personal vehicles, with 240 people working there each day. With no restrictions on hours of operation, and peak hours from 7a.m. to 7p.m. 7 days a week, there will not only be significant adverse implications on our residents in respect of noise and air quality, but the area of major concern is the traffic movements.	As a result of updates to the project design following PEIR, this Mobilisation Area has been removed from the project, therefore impacts will not occur.
Chapter 26 Air Quality	Breckland Council	December 2017	I have read the Report and have no concerns regarding general air quality matters in the Breckland area. I would add that, since this consultation first commenced, Breckland Council Has Declared an AQMA in Swaffham town centre. Although there is no indication on the transport maps that any traffic be routed through Swaffham town, I would ask that any traffic arising because of the construction or operation of the development is not routed through Swaffham town centre. I understand from a telephone	Confirmed during telephone call with Breckland Council. Traffic will not be routed through the Swaffham AQMA.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant
			conversation with one of your consultants that this is not planned, but I mention this for completeness.	

Feedback related to Health Impact Assessment (Chapter 27 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 27 Health Impact Assessment	Necton Substation Action Group	December 2017	The Action Group identifies that approximately 30 people have the potential to be affected by the onshore project substation. A school and pre-school are also noted to be approximately 1 mile away.	This observation has been considered in the conclusion of section 27.8.1.1.
Chapter 27 Health Impact Assessment	Public Health England	December 2017	PHE note that traffics movements associated with the onshore construction activities may generate localised dust emissions leading to potential complaints.	This has been considered in Chapter 26 Air Quality and the conclusions included in the assessment in section 27.8.1.2.
Chapter 27 Health Impact Assessment	Public Health England	December 2017	PHE note that the applicant is yet to develop a Construction and Environmental Management Plan (CEMP) to include measures to protect the public from harmful substances during the life of the project.	An Outline Code of Construction Practice for onshore works, and Outline Construction Environmental Management Plan for offshore works will be submitted with the DCO application.
Chapter 27 Health Impact Assessment	NHS England	December 2017	NHS England note that the project may have an impact on healthcare services within the vicinity of the application site. To evaluate the level of mitigation required as a direct result of the project, NHS England request further detail on the number of residents/ patients the project is	The number of in migrant workers has been considered in both Chapter 30 Tourism and Recreation and Chapter 31 Socio-economics. Journey times have been considered in Chapter 24 Traffic and Transport. Conclusions from these assessments have been considered in section 27.8.1.5.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			anticipated to generate (an employment plan/ trajectory) and whether any healthcare provision would be provided by the applicant.	
Chapter 27 Health Impact Assessment	Public Health England	December 2017	PHE request that the project evaluate any potential risks to health or impacts that might arise as a result of electric and magnetic fields associated with the project's electrical infrastructure.	This is considered under section 27.8.3.2.
Chapter 27 Health Impact Assessment	Necton Substation Action Group	December 2017	The Action Group notes that the whole village of Necton would potentially be affected by the substation.	This is considered in section 27.8.3.2.

Feedback related to Onshore Archaeology and Cultural Heritage (Chapter 28 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Breckland District Council	November 2017	Policy DC17 of the Core Strategy ensures that Breckland Council will preserve and enhance all designated and non-designated assets, gardens and sites of archaeological interest. At this stage a full assessment of the impact has not been carried out and there are no photomontages/visualisations of the proposed infrastructure from a historic environment perspective.	The Impact Assessment has been developed as part of a staged approach to assessment and is provided in section 28.7 of this ES. The conclusions outlined in the Impact Assessment have been based on a thorough desk-based review, as well as survey results (aerial photographic and LiDAR data assessment, geophysical survey and archaeological / geoarchaeological monitoring of geotechnical ground investigations). Site visits have been undertaken and LVIA tool-kits (e.g. ZTVs and photomontages) have been used with respect to heritage setting. The approach to heritage specific viewpoints was agreed with HE and NCC HES as part of the pre-application consultation process.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Breckland District Council	November 2017	As with the landscape impact more visual information is required and it is hereby requested that Historic England and the Historic Buildings Officer at Breckland Council are consulted on the additional work to be undertaken before the commencement of this so that appropriate viewpoints can be agreed. Continuous consultation will assist in generating suitable mitigation measures prior to the submission of the Development Consent Order application.	The application and assessment of heritage-specific viewpoints has been a point of discussion throughout the more recent stages of the EPP, with a particularly detailed discussion undertaken at the ETG meeting held on the 24th January 2018, attended by Norfolk County Council HES, Historic England, North Norfolk District Council and the National Trust. A number of 'heritage-specific' viewpoints were identified in consultation with and feedback from NCC HES and HE and recommended for assessment, as follows: <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). These viewpoints and others have informed the heritage settings assessment, where relevant (sections 28.6.2.1, 28.7.5 and 28.7.6).
Chapter 28 Onshore Archaeology and Cultural Heritage	Breckland District Council	November 2017	More information is required around effects on the historic environment.	As part of a staged approach to assessment, additional survey data (e.g. from geophysical survey and archaeological / geoarchaeological monitoring of geotechnical ground investigations) have been subject to review and incorporation into Chapter 28 of the ES.
Chapter 28 Onshore Archaeology and Cultural Heritage	Broadland District Council	November 2017	The District Council has agreed that NCC will provide comments on behalf of the District Council in respect of archaeology.	Noted. No action required.
Chapter 28 Onshore Archaeology and Cultural Heritage	CPRE	November 2017	Overwhelming case for HVDC to be taken as an embedded mitigation measure.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				Grid and this removes the need for a 100m corridor and CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	CPRE	November 2017	The advantages of HVDC transmission are obscured by the misuse and interpretation of the Rochdale Envelope by progressing HVAC and HVDC together within the envelope through the overall planning process and beyond. If the company wishes to pursue both options then it should do so in a way that makes clear the differences between the two systems.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a 100m corridor and CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	CPRE	November 2017	Re: Plate 5.16 and 5.17: This gives a useful representation but does not give a clear picture of the intrinsic differences between DC and AC in the cabling process, because there are two projects running side by side. However, the print copy of the Vanguard Consultation Summary Document does give the cable easement of Vanguard alone, and the small print is legible in this (page 36, Cable easement, Norfolk Vanguard only). The temporary working strip is 35m for DC and 50m for AC; and for the permanent easement is 13m for DC and 25m for AC. (Orsted provide no data, but using a proportionate factor allowing for a 2400 MW project rather than 1800 MW for Vanguard and Boreas, then we estimate Orsted has a temporary strip of 47m for DC and 67m for AC; and the permanent easement of 17m for DC	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a 100m corridor from the project.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>and 33m for AC). These differences are significant in the land take over 55-60 km of cabling route, and HVDC would also allow for increased wriggle room; for example some separation from farmland ponds, reduced take of hedgerows, more space from a historic building and/or its setting, less impinging on a site of archaeological interest, and avoid impacting on an underground water flow. HVDC offers a much higher level of baseline cumulative mitigation along the cabling from shore to the national grid than can be achieved by HVAC.</p>	
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>CPRE</p>	<p>November 2017</p>	<p>There is scope for avoiding removal of historic hedges, indicated from maps and an average of six or more species in 30m lengths. It is hoped there could be more use of HDD as the primary method to lessen impacts.</p>	<p>Mitigation measures outlined in relation to historic hedgerows and boundaries are included (in overview) in section 28.7.2 of this chapter and referred to, where relevant in section 28.7.5. Certain hedgerows and boundaries will be subject to survey as part of a post-consent earthwork condition survey, and subject to enhanced backfilling and reinstatement provision. On the basis of these surveys, certain earthworks, boundaries and hedgerows may be determined as requiring a higher level of reinstatement. This initial informative stage of mitigation and subsequent mitigation measure (where required) is set-out in the Outline WSI (DCO Document 8.5) and will be further detailed in a survey-specific WSI for earthwork condition survey post-consent.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	East Rushton Parish Council	November 2017	Traditional farmhouses, cottages and barns, predominantly Norfolk red brick and flint, with pantile or thatch roofs, surround 6a.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	East Rushton Parish Council	November 2017	Noise and vibration: Surrounding site 6a are historic properties built in the local vernacular; of flint and Norfolk red brick with lime mortar walls. These do not have normal foundations nor the resilience of bricks and cement mortar and are very fragile if not treated carefully and respectfully.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	East Rushton Parish Council	November 2017	The bridleway PROW BR35 from Fox Hill meets up with Munn's Loke to the east, forming a network of tracks valued by walkers, horse riders, runners and cyclists of all abilities... Maps show that these tracks date back to at least the early 1800's but the archaeological finds in the adjoining field suggest they might be much more ancient. Historically the tracks connected the various villages and churches and they are still used by locals today.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	East Rushton Parish Council	November 2017	CRS 6a: This is a beautiful Norfolk landscape with a mix of open farmland, woodland, hedgerows; the dominant landmark is Happisburgh Lighthouse and all surrounding properties are vernacular in style. Several local churches can be seen depending on the viewpoint.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	East Rushton Parish Council	November 2017	It is understood that there is evidence of archaeology on this [CRS 6a] site.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	East Rushton Parish Council	November 2017	6a is an area of open, mixed countryside, with great visual appeal. The area is surrounded by vernacular buildings, typically Norfolk red brick and flint, with pantile or thatch roofs and these are an integral part of this typical Norfolk landscape. Many benefit from open views that will be compromised either by the relay station itself or by artificial tree planting, driven by the need to screen, rather than the natural aesthetics of the landscape.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Happisburgh Parish Council	November 2017	The Council will not accept AC as an option, and recommends only DC as a possibility on the basis that AC is simply too disruptive to the fragile land in the village.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a 100m corridor and CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	Happisburgh Parish Council	November 2017	The Council urges Vattenfall not under any circumstances to consider Short Drill rather than Long Drill.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy a Long Drill at the landfall.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	Any lighting of CRS should be considerate - 1. Fully shielded (enclosed in full glass cut-off fittings) 2. Directed downwards (mounted horizontally to the ground and not tilted upwards) 3. Switched on only when needed (no dusk to dawn lamps) 4. White light low energy lamps (Philips Cosmopolis or fluorescent) and not orange or pink sodium sources).	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	There is also an area of cross over between on- and off-shore methodologies and heritage and visual impact methodologies and the LVIA report needs to consider cumulative impacts as well as the differences between landscape and seascape where it is relevant to a heritage asset, and how this will be delivered in the resulting ES.	This chapter has been partly informed by the results of the LVIA and Intertidal and Offshore Archaeology and Cultural Heritage chapters, where relevant. Correlation between the approaches adopted by these topics has been ensured through on-going communication during the Impact Assessment process and is reported on in Sections 28.7, 28.8 and 28.9 of this chapter, as necessary.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	There is the potential for deposits / remains associated with the Cromer Forest Bed Formation (CF-bF) to be disturbed and / or damaged by the process of bringing the cables onshore. If significant features / remains are identified then we would expect to see a suitable mitigation strategy established in the WSI.	In order to ascertain the presence / absence of deposits of palaeoenvironmental potential such as the CFB Formation within the project boundary, two phases of geoarchaeological monitoring (watching briefs) of onshore engineering ground investigation works have been undertaken. No deposits resembling the CFB were encountered in boreholes assessed as part of the geoarchaeological brief. Data assessed indicates that if CFB do survive, they are likely to be found at significant depth. The maximum target depth of drill for trenchless techniques is 20m (relative to mean sea level). On this basis, it has been concluded in consultation with HE and NCC HES that impacts upon geoarchaeological / palaeoenvironmental remains at the landfall are likely to be negligible (see section 28.7.4.4 and Appendix 28.6).
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	It should be noted that there is the potential for the bentonite slurry used in the HDD process to breakout and spread into/coat archaeological deposits, features and materials. Information would need to be provided regarding the chemistry, pH and composition of the drilling fluid used. The impact that these approaches would have on the archaeology would also need to be considered, particularly where the drill will pass under significant and in-situ archaeological remains. Things that need to be considered include any physical damage, changes to the burial environment and the potential for the slurry to impact on site preservation.	The potential impact of drilling fluid breakout associated with Horizontal Directional Drilling (HDD) is discussed in section 28.7.5.5.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	In 5.4.12.1.1 (paragraph 159) the heat lost per meter of HVAC cable is an important aspect to consider in terms of the historic environment, as heat may have a damaging effect on any waterlogged archaeological remains that may be present, such as palaeoenvironmental remains and waterlogged wood. Similar comments apply for HVDC cables.	The potential impact of heat loss associated with the onshore cables is discussed in section 28.7.6.2.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	We note that 5.5.1 discusses the onshore cable landfall and corridor construction method, which will require the use of HDD and excavation. The construction of the transition pits, link boxes (Section 5.5.1.3), temporary construction compounds (Section 5.5.2.4, paragraph 311) and the cable corridor (Section 5.5.3) will all need to be subject to analysis and archaeological mitigation.	The worst case scenario with respect to Onshore Archaeology and Cultural Heritage has been set out in this chapter and takes into account the construction of these elements within the onshore project area. Mitigation approaches are outlined in section 28.7.2. Further information regarding the initial informative stages of mitigation and subsequent mitigation strategies are detailed in the Outline WSI (DCO Document 8.5).
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	The project would also need to consider issues such as the impact on palaeo-environmental deposits and changes to drainage and water levels, in particular in relation to the riverine areas.	The impact of the project upon geoarchaeological / palaeoenvironmental remains is considered in section 28.7.5.4. This section has been informed by two phases of geoarchaeological monitoring (watching briefs) of onshore engineering ground investigation works, undertaken with a view to identifying palaeo-environmental deposits in the landfall area and at key crossing locations. No deposits of geoarchaeological interest were encountered, with results at the landfall indicating that CFB deposits, if present, are likely to be found at significant depth (Appendix 28.6). A scheme-wide approach to Geoarchaeological Assessment / Palaeoenvironmental Survey is proposed post-consent.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	Geotechnical investigation is also mentioned in Section 5.5.7.1.3 (paragraph 398) as part of the pre-construction works. It would be useful if the information gathered through this work could be shared with the archaeologists contracted for the onshore works as it will contain information of relevance to their work. Ideally, the geotechnical and geoarchaeological teams should collaborate on the design and assessment of the cores to ensure that opportunities are maximised and to reduce the need for duplication of effort. This also applies to the construction of the Necton National Grid Substation (Section 5.5.8).	This chapter has been partly informed by two phases of geoarchaeological monitoring (watching briefs) of onshore engineering ground investigation works (see sections 28.5.2 and 28.7.5.4 and Appendix 28.6). In addition, the potential for the project to encounter currently unrecorded geoarchaeological / palaeoenvironmental remains will be mitigated by means of implementing the embedded mitigation measures and commitments as set-out in the Outline WSI, which includes reference to a project-wide approach to geoarchaeological assessment / palaeoenvironmental survey which will be established, planned and under-taken post-consent. This will include a provision for archaeological involvement in the planning stages of any subsequent geotechnical data acquisition and the supply of survey results to the archaeologists contracted for the onshore works.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	From the evidence presented we have concluded that there are two principle overarching aspects of the project that need to be considered. These are the potential indirect impact of the proposals on the significance of designated heritage through a development within their setting, primarily from permanent structures considered necessary to deliver the project. Secondly there are direct physical impacts on non-designated heritage assets within the cable route, this impact would principally be during the construction phase, although potential impacts during the decommissioning phase are also noted.	Potential indirect impacts are considered in sections 28.7.5 and 28.7.6 of this chapter. Potential direct impacts are considered primarily in section 28.7.5. Potential impacts during the decommissioning phase are considered as part of a high-level review in section 28.7.7.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	Our primary concern is that although the PEIR chapter has identified a number of designated heritage assets affected by the new permanent infrastructure, the full assessment of the potential impacts has not yet been completed. This is mainly for the LVIA, where the historic environment is not specifically represented and there are no heritage specific viewpoints. The report has an artificial separation between onshore heritage and on-shore LVIA assessments. Some cross correlation is necessary and the LVIA needs to provide representative viewpoints.	There has been ongoing communication between the LVIA and Onshore Archaeology and Cultural Heritage assessment teams prior to and since the submission of the PEIR. As a result of these discussions, the LVIA has captured a number of heritage-specific viewpoints, the results of which have fed into this assessment (see sections 28.7.5 and 28.7.6 and Appendix 28.7).
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	We note that the main new above-ground infrastructures for the project would be the proposed substation at Necton. If the HVAC connection system is used, then a cable relay booster station would also be needed, and that two locations are currently proposed at Ridlington (5a and 6a). We note that Table 28.15 within the PEIR sets out a strategy for further assessing the impact of the proposed above-ground infrastructure on the setting of designated (and selected non-designated) heritage assets, and states that the results of which will be submitted in the ES as part of the DCO application. We are generally supportive of the approach taken for the analysis of both these options however as discussed view points and photomontages are needed to support the analysis in this chapter with regards to the impact of these permanent features on the significance of heritage assets through a development within their setting.	The LVIA has captured a number of heritage-specific viewpoints in relation to the onshore project substation. These have been fed directly into the heritage settings assessment (see sections 28.7.5 and 28.7.6 and Appendix 28.7). Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	We would however recommend that the locations of the heritage viewpoints are agreed with historic England prior to the submission of the DCO application. We anticipate that this conversation would also need to include Norfolk County Council, and the Conservation Officers at North Norfolk District Council. We would also expect better integration of historic environment though the chapter's particular good cross referencing between the heritage and LVIA chapters.	<p>The application and assessment of heritage-specific viewpoints has been a point of discussion throughout the more recent stages of the EPP, with a particularly detailed discussion undertaken in the ETG meeting held on the 24th January 2018, attended by Norfolk County Council HES, Historic England, North Norfolk District Council and the National Trust. A number of 'heritage-specific' viewpoints in relation to the onshore project substation were identified in consultation with and feedback from NCC HES and HE and recommended for assessment, as follows:</p> <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). <p>These viewpoints have informed the heritage settings assessment, where relevant (sections 28.7.5, 28.7.6 and Appendix 28.7).</p>

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	<p>We note the visualisations that have been included (see Chapter 29. Landscape and Visual Impact Assessment) and as stated above these are not specifically historic environment viewpoints or taken views from key heritage assets. The visualisations do however support our view that that further investigation and consultation is necessary to identify the potential impact upon the significance of assets. We are of the view that more could have been done at this stage to identify those assets where viewpoints would be necessary and those that could be scoped out of further analysis at this stage. We have a particular concern about the powerful presence of the medieval churches in this part of the coastal landscape. They are very prominent features in the landscape and we have argued consistently about the strong inter-relationship and inter-visibility between these churches, which is contributes much to the significance of these assets in setting terms. In particular further work needs to be undertaken to assess the significance of, and impacts upon St Mary's Church at Happisburgh (Grade I listed), St Peter's Church at Ridlington (Grade I listed), and possibly from further field to Walcott and Bacton churches, and the Happisburgh conservation area. Further heritage specific viewpoints may also be required for the scheduled monuments to the east of substation.</p>	<p>As above, the application and assessment of heritage-specific viewpoints has been a point of discussion throughout the more recent stages of the EPP, with a particularly detailed discussion undertaken in the ETG meeting held on the 24th January 2018, attended by Norfolk County Council HES, Historic England, North Norfolk District Council and the National Trust. A number of 'heritage-specific' viewpoints in relation to the onshore project substation were identified in consultation with and feedback from NCC HES and HE and recommended for assessment, as follows:</p> <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). <p>These viewpoints have informed the heritage settings assessment, where relevant (sections 28.7.5, 28.7.6 and Appendix 28.7).</p> <p>Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project. As such, impacts of the project upon the setting of the medieval churches within the coastal landscape are no longer relevant on the basis that significant above-ground infrastructure in the form of a CRS is no longer required.</p>

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	We are also concerned about the impact of the HVAC booster stations (particularly option 5a) and would note that the open nature of the landscape here means that these new elements will be highly visible. We also note that screening is proposed and again this is noted in LVIA chapter Figure 29.9 (maps 1-3). Given this is a very open landscape the impact of screening may also in itself be harmful, as it would be an alien form in that specific landscape context. That screening could be a new and harmful element in a landscape was recently agreed at a public appeal.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	Chapter 28.6.5 states that geophysical surveys will be carried out as part of the evaluation of the onshore undesignated assets. We would recommend that the most appropriate geophysical techniques are utilised, which in some cases may result in more than one geophysical techniques being applied to a given area. This would maximise the chances of identifying any archaeological features, and hopefully minimise the risk of any unexpected finds.	<p>A standard detailed magnetometry technique was utilised for the acquisition of priority archaeological geophysical survey data (see Appendix 28.5), as agreed with NCC HES. Magnetometry was considered the only feasible method at this stage to cover an area of the size proposed for survey, which will allow post-consent trial trenching to be better targeted with a fuller data source. There are currently no plans for the application of alternative geophysical survey techniques as part of the post-consent surveys (initial informative stages of mitigation work). Alternative survey techniques will, however, be considered on a case-by-case basis where magnetometry was not found to be effective to the circumstances of previously recorded potential sub-surface features (also taking into account the geological conditions and soil types) and will only be employed where required on a case by case basis, in a manner that is both proportionate and appropriate.</p> <p>The application of any such methods will be outlined in a survey-specific WSI post-consent. Other forms of post-consent survey (e.g. metal detecting / field walking) will also be undertaken as initial informative stages of mitigation to further maximise the chances of identifying archaeological features that may not be visible on geophysical survey data. Such surveys will be undertaken in agreement with NCC HES and HE in order to further establish specific and bespoke mitigation requirements on a case-by-case / area-by-area basis, as required, and set-out in the Outline WSI (DCO Document 8.5) and detailed in survey-specific WSIs.</p>

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	In section 28.7.1.1, paragraph 113: it is suggested that micro-siting will be used where possible to avoid undesignated heritage assets, but where this is not possible the remains will be archaeologically investigated and recorded, referred to as preservation by record (paragraph 114). We believe that this mitigation strategy is sensible and appropriate but recommend that reference is made to the Historic England 'Preservation of Archaeological Remains' (2016) guidance, as this sets out a process/decision tree to help guide decisions about this process (see https://historicengland.org.uk/images-books/publications/preserving-archaeologicalremains/).	Reference to Historic England's 'Preservation of Archaeological Remains' (2016) guidance is included in the chapter. Reference to this guidance is also included in the Outline WSI (DCO Document 8.5).
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	We would also recommend that the maximum time that any archaeology will be exposed for following discovery or after the topsoil has been stripped should be included in any subsequent WSIs to ensure that archaeology is not left exposed to the elements for an extended period of time. Archaeological sites can suffer from weathering which can lead to the damage and/or loss of features/deposits. Heritage crime is also a significant issue particularly illegal metal detecting that is targeted towards soil stripped archaeological sites. Sites must not be left stripped for significant periods of time and adequate security and protection needs to be put in place at this stage of the project to mitigate this.	Reference has now been included as part of the Outline WSI (DCO Document 8.5).

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	<p>The impact that the development could have on geoarchaeological and palaeoenvironmental remains is discussed in Section 28.7.4.4, which includes consideration of the potential damage to, and loss of remains, as well as changes to hydrology / water levels in a given area. This may lead to the desiccation and drying out of wetland deposits and associated waterlogged archaeological or palaeoenvironmental remains. We recognise this is an important consideration in this area and agree that this is particularly important at the landfall location and at areas adjacent to the low lying river valleys. The impact that the development works may have on any archaeological deposits or features of interest cannot be known without carrying out evaluation works; the PIER has therefore adopted the worst case scenario for this purpose. We support of this approach, and agree about the heritage significance of any palaeoenvironmental and geoarchaeological evidence for the Lower Palaeolithic (Section 28.7.4.4, paragraph 204). In addition, we agree with the conclusion that the potential impacts of the development would be ‘major adverse’ in the absence of mitigation archaeology. We would consider this to be a significant impact in EIA terms.</p>	Noted.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	<p>The development of deposit models and palaeoenvironmental assessments following the proposed programme of geoarchaeological monitoring would help to understand the deposits and their potential, which in turn will help inform subsequent mitigation strategies. This needs to be</p>	<p>The geoarchaeological monitoring and assessment work to date has been undertaken by Wessex Archaeology. The details of the results are presented in Appendix 28.6. and have informed the proposed mitigation strategies set out in this chapter and the Outline WSI</p>

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			integrated into a follow up strategies and results disseminated.	(DCO Document 8.5). These results to date are to be disseminated to the AHOB group.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	Chapter 28.10 (paragraph 248) states that an embedded mitigation strategy, that would seek to minimise the impact of the development on the historic environment, in particular the archaeological remains, will be developed following a programme of assessment survey and evaluation. We support this, and note that the results of this work are pending. We also note other assessments have been proposed (e.g. geophysical survey, metal detecting etc.) in order to fully assess the heritage significance of non-designated and potential heritage assets. The evaluation and mitigation requirements post-consent summarised in paragraph 249 and Table 28.15 would seem appropriate, but it may be useful to include the potential for additional geoarchaeological coring work where necessary as a precaution, just in case features are identified that need to be sampled using this approach.	Additional geoarchaeological coring work is discussed in section 28.7.5. The project will implement the embedded mitigation measures and commitments as set-out in the Outline WSI (DCO Document 8.5), which includes reference to a project-wide approach to geoarchaeological assessment / palaeoenvironmental survey which will be established, planned and undertaken post-consent.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	The report acknowledges the potential for previously unidentified heritage assets within the onshore cable route and at the proposed sub-station sites. A programme of pre-application archaeological work also proposed and we note that the results will be included in the Environmental Statement submitted with the DCO application. We would want to ensure that this includes the evidence from the geotechnical surveys, particularly the Happisburgh landfall site, so that this evidence can be integrated into the on-going mitigation and dissemination strategy. We also note a range of mitigation options for buried and above-ground archaeological remains are set out in the chapter, and the WSI for the pre- and post-consent mitigation would need to be developed in consultation with Historic England and with Norfolk County Council Historic Environment Service. We also note that Appendix 28.1 (Archaeological Desk-Based Assessment), Annex 28.1.2 the non-designated assets gazetteer does not appear to be the correct version?	28.7.5 and Appendix 28.6). The overarching outline summary details and principles of the post-consent initial informative stages of mitigation work are set out in the Outline WSI (DCO Document 8.5). Annex 28.1.2 (Appendix 28.1) has been rectified for the DCO application.
Chapter 28 Onshore Archaeology and Cultural Heritage	Historic England	November 2017	We also note that a number of historic hedgerows will be removed as part of the cabling works. One problem noted with mitigation strategies of this type is that they focus on the spaces between the field boundaries, and not the boundaries themselves. Although the HLC assessment (see figure 28.3) notes the apparent age and character of the landscape it is known from recent research that these boundaries are often much earlier. This project will require the removal of a number of these hedgerows throughout the cable corridor	Mitigation measures outlined in relation to historic hedgerows and boundaries are included (in overview) in section 28.7.2 of this chapter and referred to, where relevant in section 28.7.5. Certain hedgerows and boundaries will be subject to survey as part of a post-consent earthwork condition survey, and subject to enhanced backfilling and reinstatement provision. On the basis of these surveys, certain earthworks, boundaries and hedgerows may be determined as requiring a higher level of reinstatement. This initial informative stage of mitigation and subsequent

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			<p>which would provide an opportunity to characterise and date historic hedgerows This is a regional research question and this needs to be considered in the ES and a mitigation strategy put in place.</p>	<p>mitigation measure (where required) is set-out in the Outline WSI (DCO Document 8.5) and will be further detailed in a survey-specific WSI for earthwork condition survey post-consent.</p>
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>Historic England</p>	<p>November 2017</p>	<p>L VIA chapter: We note the details 29.2 paragraph 3. As discussed above we are of the view that further visualisations are needed, and that these are specifically produced to illustrate the views to and from designated heritage assets, and other historic environment features. Images are required for both of the CRS site options and for the substation, in particular views that provide a representative assessment of St Peter’s Church, Ridlington, All Saint’s Church, Walcott, and St Mary’s Church, and from the monuments to the south east of Necton.</p>	<p>A number of ‘heritage-specific’ viewpoints have been identified in consultation with and feedback from NCC HES and HE and recommended for assessment, as follows:</p> <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). <p>These viewpoints have informed the heritage settings assessment, where relevant (sections 28.7.5, 28.7.6 and Appendix 28.7)</p> <p>‘Heritage-specific’ viewpoints in relation to the CRS site options are no longer required for inclusion. Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK’s National Grid and this removes the need for a CRS from the project.</p>

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Chapter 28 Onshore Archaeology and Cultural Heritage	N2RS	November 2017	Concerns about historic and vernacular buildings; in terms of vibration and visual impact.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	The route passes through land which is inalienable and for this reason the Trust would not be supportive of any above ground structures within the Blickling estate.	Noted. No above ground infrastructure is required within the Blickling estate. Should any link boxes be required along this section of the route, the project will ensure that they are buried to ground level.
Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	The Trust is however concerned about the impact of the proposal upon potential archaeological deposits and this has been considered by our archaeologists...The propose route through the estate measures around 4.5km in length... The topographical and geological setting of the immediate area around the Blickling corridor is ideal for prehistoric transient activity and settlement and the location within a river valley also carries high potential for prehistoric ceremonial and funerary activity. Around Silvergate and Abel Heath where the corridor crosses the estate are a number of ring-ditches (likely representing Bronze Age funerary barrow monuments) as well as an extremely large ring-ditch of a probable later prehistoric ceremonial monument and a number of other probable prehistoric trapezoidal enclosures. To the west of this adjacent to the Oulton Belt of woodland, the corridor also crosses and area of linear enclosure	The potential for sub-surface archaeological remains to be present within the cable route has to date(pre-consent) been informed by a staged approach to assessment and survey, including desk-based research (Appendix 28.1), aerial photographic and LiDAR data assessment (Appendix 28.1, Annex 28.1.3), a priority programme of targeted archaeological geophysical survey (Appendix 28.5) and geoarchaeological monitoring of engineering-led ground investigation works (Appendix 28.6). The potential for sub-surface remains will further be informed by additional survey and evaluation (initial informative stages of mitigation work) to be planned, agreed and undertaken post-consent. This will be followed by additional mitigation measures and approaches, as and where required (see sections 28.7.2 and 28.7.5 and the Outline WSI – DCO Document 8.5). Ongoing consultation and engagement with the National Trust Estate Manager and Archaeologist(s) will be maintained at and through the post-consent, pre-construction and construction stages,

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			<p>likely to be Roman or medieval field systems and activity. Around Silvergate, there is considered to be medieval settlement evidence predating the existing houses whilst to the east where the corridor enters the Blickling Estate boundary, there is a known post-medieval brick kiln. It is important to note that the cropmark data is by no means a complete record of all buried archaeological remains and should be used as an indicative guide to the potential for archaeological activity within the area.</p>	<p>and archaeological approaches and requirements will be agreed with the National Trust, alongside NCC HES and HE.</p>
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>National Trust</p>	<p>November 2017</p>	<p>It is important that the NT work collaboratively with the County Planning Archaeologist as well as the developer to achieve a suitable and appropriate methodology for the archaeological work to be undertaken at the Blickling estate in advance of the proposed development.</p>	<p>Consultation has been undertaken with the National Trust at the ETG meeting on the 24th January 2018 and as part of an additional meeting held specifically in relation to the National Trust's interests on the 13th March 2018 (detailed below). It is understood that the National Trust also held a meeting with James Albone (NCC HES) on the 5th April 2018 to discuss archaeological survey requirements for the project within National Trust land. The results of these meetings will further inform the nature of required initial informative stages of mitigation works to be undertaken post-consent within the National Trust land and have been provisionally referenced within the Outline WSI (DCO Document 8.5), where relevant.</p>

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Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	The corridor through the estate should first be subjected to geophysical survey and a programme of field walking and metal-detecting. (Saxon cemetery sites, for example are often found by metal detecting and fieldwalking).	The proposed initial informative stages of mitigation works include provision for the acquisition of additional geophysical survey data, field walking and metal-detecting surveys (see section 28.7.2). Such surveys will be undertaken in agreement with NCC HES, HE and the National Trust in order to further establish specific and bespoke mitigation requirements on a case-by-case / area-by-area basis, as required, as provisionally set-out in the Outline WSI (DCO Document 8.5) and to be detailed further in survey-specific WSIs, post-consent.
Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	On the basis of the geophysical results, a systematic trench evaluation should be conducted within the corridor of up to 5% of the total area, targeting specific anomalies and/ or blank spaces to test the nature, extent and date of the buried archaeological remains. The results of the geophysics and trench evaluation will help determine those areas in need of full excavation which will preserve by record any significant remains which will be lost or destroyed by the proposed development.	The post-consent initial informative stages of mitigation work includes for a programme of project-wide (and targeted) archaeological trial-trenching (see section 28.7.2). The overarching outline summary details and principles of the post-consent initial informative stages of mitigation work are also set out in the Outline WSI (DCO Document 8.5) prepared for Onshore Archaeology and Cultural Heritage.
Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	The NT have a duty to investigate fully any significant remains and in line with this, it would be imperative to ensure that significant archaeological remains are excavated to a high standard and importantly, are excavated in their entirety where necessary. This would include, for example, if the corridor bisected a Bronze Age burial mound, then it would be essential to widen the excavation area to encompass the entire mound.	The post-consent initial informative stages of mitigation work will be followed by additional mitigation measures and approaches, as and where required, on a case-by-case and area-by-area basis. The extent of any required archaeological excavation areas will be agreed in consultation with NCC HES, HE and the National Trust. The width of excavation areas will, however, be set and limited by the order limits of the DCO, as well as other factors.

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Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	NT CPI objectives to better understand our archaeology and heritage and its significance in order to provide this information to future generations and better inform decisions which will directly or indirectly affect our heritage. To achieve this, a systematic programme of geophysics and fieldwalking/metal detecting should be conducted in an agreed area around Silvergate and Abel Heath where medieval activity likely pre-dates the existing settlement, but also where ancient, prehistoric activity undoubtedly extends across the wider landscape as suggested by the visible cropmarks. In order to fully understand any remains exposed and excavated within the corridor, it is important to demonstrate where possible how these relate to the wider landscape.	The initial post-consent informative stages of mitigation works include provision for field walking and metal-detecting (see section 28.7.2). Such surveys will be undertaken in agreement with NCC HES, HE and the National Trust (when within the confines of the Blickling Estate) in order to further establish specific and bespoke mitigation requirements on a case-by-case / area-by-area basis, as required.
Chapter 28 Onshore Archaeology and Cultural Heritage	National Trust	November 2017	The information above has been written as a basic guide to the NT archaeological requirements at Blickling and further consultation for any archaeological investigations should be sought, working in conjunction with the County Planning Archaeologist, the NT planning and archaeology consultants and the developer.	Consultation has been undertaken with the National Trust at the ETG meeting on the 24 th January 2018 and as part of an additional meeting held specifically in relation to the National Trust's interests on the 13 th March 2018 (detailed further below). It is understood that the National Trust also held a separate meeting with James Albone (NCC HES) on the 5 th April 2018 to discuss archaeological survey requirements for the project within National Trust land.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Necton Parish Council	November 2017	Chapter 28, figure 28.2 shows that the National Grid Temporary Works Area at Necton will significantly overlap an archaeological site including the recorded area of a medieval moat. We would expect the Developer to alter the works area to ensure there is no disturbance to this site.	In order to minimise the interaction between the works and AP 1 / RHDHV 1015 (potential sub-surface remains of a moat of possible medieval date and associated ditches, boundaries and enclosures), this feature has been subject to direct consideration as part of the iterative design process which sought to avoid this feature to the greatest degree possible, within the confines of engineering and other constraints. As such, interaction between the works in this area and the recorded extent of the feature is now much reduced and minimal in its overlap (see section 28.7.5).
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk Coast Partnership	November 2017	We anticipate that some of the construction and final infrastructure may be visible from the Paston area of the AONB, particularly if AC technology is used and site 5a is selected for the CRS. Thus we suggest the use of DC technology (to avoid the need for a CRS) and/or the selection of site 6a (which is further from the AONB boundary) is preferable.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Ridlington - the photomontages within Chapter 29 of the PEIR reveal issues that need to be further investigated prior to the completion of the full ES. In particular, viewpoint 1 for CRS Option 5a shows that the proposed infrastructure would affect the view towards St Mary's Church at Happisburgh (Grade I listed) from a location close to St Peter's Church at Ridlington (Grade I listed). The medieval churches in this part of the coastal landscape are very prominent landscape features and inter-visibility between them has been identified as forming part of their combined setting and significance.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

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Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	It is felt that further evidence, in terms of photomontages / visualisations, is needed in respect of the proposed CRS near Ridlington and that this will need to be covered and addressed in the OLEMP (see detailed Historic Environment comments in the Appendix). The location of the proposed CRS will need to avoid / minimise the impact on the setting and inter - visibility of the local historic churches in the area.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Chapter 28 of the PEIR provides baseline data about the historic environment implications of the onshore cable route and its associated infrastructure. Two key aspects are considered; (a) the potential indirect impact of the proposals on the setting of designated heritage assets - which is principally relevant to the construction and operation phases of the project – and (b) the physical impact on undesignated heritage assets with archaeological interest – principally during the construction phase. Potential impacts during the decommissioning phase are also considered.	Noted. No action required.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	The onshore above-ground infrastructure for the project includes a proposed substation at Necton and, if a HVAC connection is used, a CRS for which two site options are currently proposed at Ridlington. The PEIR chapter has identified a number of designated heritage assets (including scheduled monuments, listed buildings, conservation areas and designated parks and gardens) which may have their settings affected by the proposed infrastructure for the project but does not carry out a full assessment of the impact at this stage. Some photomontages / visualisations of the proposed infrastructure have been included in Chapter 29 (Landscape and Visual Impact Assessment) but these have not been produced specifically from a historic environment perspective.	A number of 'heritage-specific' viewpoints in related to the onshore project substation have been identified in consultation with and feedback from NCC HES and HE and have been included within the assessment. These include the following: <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). These viewpoints have been included within the heritage settings assessment, where relevant (sections 28.7.5, 28.7.6 and Appendix 28.7) 'Heritage-specific' viewpoints in relation to the CRS site options are no longer included. Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Chapter 28 outlines a programme of pre-application archaeological work, the results of which will be included in the ES submitted with the DCO application. This includes geotechnical surveys (including at the Happisburgh landfall site), and targeted geophysical surveys which are currently being undertaken along the cable route and at proposed infrastructure / mobilisation sites. A range of post-consent mitigation options for buried and above-ground archaeological remains are also set out. The programme of pre-application archaeological evaluation and post-	The geophysical survey results from the priority programme are detailed in Appendix 28.5 and discussed in section 28.7.5 (where relevant). The geoarchaeological monitoring results are detailed in Appendix 28.6 and also discussed in section 28.7.5 (where relevant). The range of post-consent mitigation options are outlined in section 28.7.2 and set-out further in the Outline WSI (DCO Document 8.5).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>consent mitigation has been developed in consultation with Norfolk County Council Historic Environment Service and Historic England.</p>	
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>Norfolk County Council</p>	<p>November 2017</p>	<p>Vattenfall and their heritage consultant (Royal HaskoningDHV) should continue to assess the setting of the designated heritage assets (and selected non-designated heritage assets) that may be affected by the proposed CRS. This assessment should include further heritage-asset specific visualisations to be included in the ES and should be carried out in tandem with any further assessment of wider landscape impact issues. It is requested that the locations of the visualisation viewpoints are agreed with Norfolk County Council, Historic England and the Conservation Officers at Breckland Council / North Norfolk District Council ahead of the assessment taking place and that the results, and proposed mitigation measures, are discussed with these consultees prior to the submission of the DCO application.</p>	<p>A number of onshore project substation related 'heritage-specific' viewpoints have been identified in consultation with and feedback from NCC HES and HE and assessment as part of the ES. These include the following:</p> <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). <p>These viewpoints have informed the heritage settings assessment, where relevant (sections 28.6.2, 28.7.5 and 28.7.6 and Appendix 28.7).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Vattenfall and their heritage consultant (Royal HaskoningDHV) should also continue to liaise with Norfolk County Council Historic Environment Service and Historic England and other key stakeholders (e.g. AHOB) regarding the potential physical impact on buried and above-ground archaeological remains. It is requested that this includes discussion of the geotechnical and geophysical survey results and the proposed mitigation measures prior to the production of the full Environmental Statement for the DCO application.	Consultation with various key stakeholders is outlined in section 28.3 and detailed in this Appendix 28.2. The geophysical survey results are detailed in Appendix 28.5 and discussed in section 28.6.3 and section 28.7 (where relevant). The geoarchaeological monitoring results are detailed in Appendix 28.6 and also discussed in section 28.7.5. The results (where available at the time) from these surveys were discussed in the ETG meeting held on the 24th January 2018, attended by Norfolk County Council HES, Historic England, North Norfolk District Council and the National Trust.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	<p>Further visualisations produced from a historic environment perspective are required for both of the CRS site options and the substation site. Specifically, for CRS Option 5a. The County Council request that the following views are included in the additional work;</p> <ul style="list-style-type: none"> • View from Bachelor’s Lane to the NW of St Peter’s Church, Ridlington looking SE to include the church and CRS Site Option 5a. • View SW from All Saint’s Church, Walcott toward CRS Site Option 5a. • View SSW from Rookery Farm Road close to the junction with Coast Road, including All Saints’ Church Walcott and CRS Site Option 5a. • CRS Site Option 5a Viewpoint 7 should be supplemented with a view from the top of the tower of St Mary’s Church in Happisburgh as this is opened to the public. This should also be included for CRS Option 6a. • View from the top of the tower of St Mary’s Church East Ruston towards the proposed CRS options. 	<p>The identification, capturing and assessment of heritage-specific viewpoints has been a point of discussion throughout the more recent stages of the EPP, with a particularly detailed discussion undertaken in the ETG meeting held on the 24th January 2018, attended by Norfolk County Council HES, Historic England, North Norfolk District Council and the National Trust. A number of ‘heritage-specific’ viewpoints were identified in consultation with and feedback from NCC HES and HE and recommended for assessment, these include from:</p> <ul style="list-style-type: none"> • Church of St. Andrew, Bradenham (34); • Church of All Saints, Necton (36); and • The Old Hall, Fransham (58). <p>These viewpoints have informed the settings assessment, where relevant (sections 28.6.2.1, 28.7.5 and 28.7.6 and Appendix 28.7). ‘Heritage-specific’ viewpoints in relation to the CRS site options are no longer required and therefore not illustrated within the ES. Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK’s National Grid and this removes the need for a CRS from the project.</p>

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Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Table 28.7 within Chapter 28 and Section 28.2.3.2 of the Desk-Based Assessment (Appendix 28.1) refer to historic map research having been carried out at Norfolk Record Office. While further analysis of cartographic sources for the full Environmental Statement is mentioned, it is important to note that pre-enclosure maps at the Norfolk Record Office (and other relevant repositories) need to be consulted and incorporated into the analysis. For some parts of the route (e.g. Cawston) 17th and 18th century maps are available at the NRO. The information on these maps relating to former land-use and boundaries will be important for the interpretation of the air photo and geophysical survey data.	A commitment to review pre-enclosure maps to further inform upon the planning and placement of post-consent archaeological trial trenches has been included within the outline WSI (DCO Document 8.5).
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Section 28.6.5.1 of Chapter 28 outlines the proposed mitigation measures for below-ground archaeological remains. Para 99 within this section, which states that other techniques are being considered, needs to reference field-walking as well as metal-detecting (as indicated in Table 28.2).	The initial informative stages of post-consent mitigation works include provision for field walking and metal-detecting (see section 28.7.2). Such surveys will be undertaken in agreement with NCC HES and HE in order to further establish specific and bespoke mitigation requirements on a case-by-case / area-by-area basis, as required, and are initially set-out in the Outline WSI (DCO Document 8.5) and will be further detailed in survey-specific WSIs to be produced in the post-consent stages.
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	Some amendments to the terminology within the Historic Environment and Cultural Heritage chapter would be beneficial so that appropriate terms can then be applied throughout the project. NCC Historic Environment Service is now using the term 'evaluation' only for pre-determination archaeological works. Any post-consent	The DCO application includes a commitment from the project to undertake a number of additional programmes of survey and evaluation post-consent, referred to throughout this chapter as post-consent initial informative stage(s) of mitigation work.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			archaeological work forms part of a mitigation strategy, with survey phases (e.g. further geophysical survey and trial trenching) comprising an initial informative stage of the mitigation work.	
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	There is potential to address some decommissioning impacts on buried archaeological remains at the construction phase if archaeological mitigation through recording takes into account any additional ground-disturbance likely to result from the future removal of structures on the project.	Noted.
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	In Appendix 28.1 (Archaeological Desk-Based Assessment), Annex 28.1.2 the non-designated assets gazetteer is not the correct table – the designated assets table is repeated in error. The gazetteer of non-designated assets is included separately as Appendix 28.4. However, in this version the RHDHV ID numbering of the entries is not continuous. Comparing this with an earlier version from the draft Desk-Based Assessment it appears that the omitted entries relate to sites that lay within earlier versions of the proposed cable route corridor search area or in the intertidal zone. The reason for the omission of the entries needs to be stated.	These errors have been rectified in preparation for the DCO application. As stated by NCC, a number of heritage assets have been omitted from the gazetteers due to being beyond the study area as based on the project design parameters as assessed within this chapter or due to them being considered as part of the Intertidal and Offshore Archaeology and Cultural Heritage chapter. The explanation for these omissions is now stated within Appendices 28.3 and 28.4.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	Norfolk County Council	November 2017	<p>Table 28.10 within Chapter 28 lists the Areas of Possible Archaeological Interest as Groups. It would be useful for the ES if these could be shown on maps of the route as well – which is not currently the case. The addition of Norfolk HER numbers in this table would also make cross-referencing the information much easier. There are a number of comments on the individual Groups listed in this table as follows;</p> <p>Group 1. RHDHV 1015 is a very clear cropmark of a medieval moat with associated features newly recorded by the air photo survey (Site AP1). It should be considered to have Medium – High significance rather than just Medium (see also below).</p> <p>Group 6. RHDHV ID number (1180) is missing.</p> <p>Group 14. Is this group correct as the two heritage assets listed are 1.2km apart? Should it actually include RHDHV 411 (a burnt mound) rather than RHDHV 1379 (lime kiln)?</p> <p>Group 24. RHDHV 968 should be 698.</p> <p>Group 49. Includes RHDHV 2955. This number is higher than those listed in the gazetteer and is presumably an error.</p> <p>Group 52. Earthwork bank RHDHV 1148 is probably associated with a parish boundary and should therefore be considered as being of Low - Medium significance rather than just Low.</p> <p>Group 54. It is possible that the cropmark features in this group will be associated with buried archaeological remains associated with settlement. As such the (worst case scenario) significance of this group should be seen as</p>	<p>The Areas of Archaeological Interest as presented in the PEIR chapter were considered as part of a preliminary assessment of areas of potential archaeological interest as indicated by data available at the time of the PEIR submission. Since the PEIR submission, priority archaeological geophysical survey data has been acquired, enabling a more site-specific approach to be undertaken. The baseline environment in relation to non-designated heritage assets, as presented in this chapter, now accounts for potential sub-surface archaeological remains (section 28.6.3.1) and above ground non-designated heritage assets (section 28.6.3.2). The suggestions made by NCC regarding heritage significance have been incorporated into these sections, where relevant, and reflected in the impact assessment in section 28.7.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>Medium - High rather than Medium. Group 60. RHDHV 1362 is not listed in Appendix 28.4.</p>	
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>Norfolk County Council</p>	<p>November 2017</p>	<p>The air photo assessment (Figure 28.4) has established that features associated with a known medieval moated site (RHDHV 1015 / AP1) extend beyond the site boundary previously recorded in the Norfolk Historic Environment Record (as shown on Figure 28.2). Figure 28.2 shows that the National Grid Temporary Works Area at Necton will significantly overlap this archaeological site, including the previously recorded area of the medieval moat itself. Further consultation with NCC Historic Environment Service and Historic England is therefore required to ensure disturbance to significant archaeological remains at this site is avoided.</p>	<p>In order to minimise the interaction between the works and AP 1 / RHDHV 1015 (potential sub-surface remains of a moat of possible medieval date and associated ditches, boundaries and enclosures), this feature has been subject to direct consideration as part of the iterative design process which sought to avoid this feature to the greatest degree possible, within the confines of engineering and other constraints. As such, interaction between the works in this area and the recorded extent of the feature is now much reduced and minimal in its overlap (see section 28.7.5).</p>
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>North Norfolk District Council</p>	<p>November 2017</p>	<p>As it stands the available evidence suggests that, in particular, the CRSs at either Ridlington (Option 5a) or East Ruston (Option 6a) and the need for noise and landscape mitigation in order to try make those elements of the project acceptable, would likely result in a form of development that would be totally out of character with this relatively intact, historic and highly valued landscape within which many historic assets are</p>	<p>Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			located and whose setting would be harmed by the proposal.	
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	7.4.3 Whilst the District Council recognise that Vattenfall do not wish to select a specific transmission system at this stage, the need for CRSs associated with a HVAC transmission system and a desire for CRSs be situated at a 'near to mid-point' location between the windfarm and substation at Necton mean that the ability to find a suitable site for one/two CRSs for the Norfolk Vanguard and Norfolk Boreas schemes is proving highly challenging. The District Council will continue to push Vattenfall to consider more appropriate and less sensitive locations on which to place the CRSs. In the absence of a viable alternative, the District Council would suggest that a High Voltage Direct Current (HVDC) transmission system which does not require CRSs may be the only suitable option which will not result in long-term significant adverse impacts across the District of North Norfolk.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	CRS: Both sites are in open countryside, the northern most of which has little natural screening in the form of topography or established areas of woodland or planting and would therefore be particularly visible in the relatively flat, open landscape of this part of the North Norfolk District.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	CRS: Whilst the response from Vattenfall sets out that a location further inland would have a requirement for more reactive power compensation and could therefore result in greater electrical inefficiencies during transmission, it would be expected that Vattenfall would set out the likely technical implications so that a reasonable planning judgement can be reached in considering whether any loss in electrical efficiency can be outweighed by the landscape impacts of a CRS at either Ridlington or East Ruston. As there is significant local opposition to the siting of this large infrastructure in an essentially unchanged rural landscape, the District Council would wish to understand why this facility has to be in this location and could not, for example, be sited somewhere closer to the North Walsham industrial estate where the wider landscape impact may not be as significant.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	CRS: The precise design of the HVAC CRS has not been fixed at this stage but Vattenfall have set out visual representations of how the CRS may look within Volume 2 Chapter 29 LVIA Visualisations. These include details of suggested landscape mitigation planting as well as visualisations of the Norfolk Vanguard and Norfolk Boreas CRSs as they may look together. Vattenfall has indicated the	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			following maximum design scenario for the Norfolk Vanguard development (a similar facility could also be proposed if plans for the Norfolk Boreas scheme are also progressed).	Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	Operational Impacts would generally be considered to be long term or permanent as they would likely endure for the expected 25+ years life of the wind farm and include any CRS facility, which would be a permanent feature in the landscape during the lifetime of the development. Such a facility, sited between Ridlington and East Ruston, would therefore have a long-term impact on this part of the district.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	Whilst a variety of different issues and impacts would arise, the main likely impacts of the proposal would be in relation to:- landscape and impact on heritage assets.	The sensitivity of the landscape in relation to the project from a heritage perspective has been subject to consideration as part of a detailed heritage settings assessment (sections 28.6.2.1, 28.7.5, 28.7.6 and Appendix 28.7), and has been further informed by the use of LVIA tool-kits (e.g. ZTVs and photomontages), where relevant.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	The District Council recommends that further work needs to be undertaken by Vattenfall to identify those hedgerows/field boundaries that would benefit from trenchless techniques to ensure that these important ecological and landscape features can be retained. This is critical as compensatory planting will not be able to include replacement trees over the buried cable routes.	Mitigation measures outlined in relation to historic hedgerows and boundaries are included (in overview) in section 28.7.2 of this chapter and referred to, where relevant in section 28.7.5. Certain hedgerows and boundaries will be subject to survey as part of a post-consent earthwork condition survey, and subject to enhanced backfilling and reinstatement provision. On the basis of these surveys, certain earthworks, boundaries and hedgerows may be determined as requiring a higher level of reinstatement. This initial

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				informative stage of mitigation and subsequent mitigation measure (where required) is set-out in the Outline WSI (DCO Document 8.5) and will be further detailed in a survey-specific WSI for earthwork condition survey post-consent.
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	In terms of delivering wider public benefits, there may be opportunities for Vattenfall to fund wider landscape mitigation to repair historical damage to field boundaries resulting from modern agricultural practices and to enhance local landscape character.	Impact to the HLC has been minimised through careful route selection and will, in part, be further off-set by returning field boundaries / hedgerows to their preconstruction condition and character post-construction, wherever possible, as part of a sensitive programme of backfilling and reinstatement / landscaping (see section 28.7.2).
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	Whilst is clear that extensive work has been undertaken by Vattenfall in identifying the heritage assets likely to be affected, at this stage until a number of design solutions have been identified it is extremely difficult to assess the likely impacts on heritage assets, particularly in relation to how development will affect setting such as at HVAC CRS locations.	Potential impacts upon heritage assets have been considered as part of a detailed Impact Assessment, informed by a staged programme of assessment, survey and evaluation (section 28.5 and 28.6). The sensitivity of the landscape in relation to the project from a heritage perspective has been subject to consideration as part of a detailed heritage settings assessment (sections 28.6.2.1, 28.6.4, 28.7.5 and 28.7.6), and has been further informed by the use of LVIA tool-kits (e.g. ZTVs and photomontages), where relevant. Heritage settings impacts in relation to the CRS site options are no longer subject to consideration. Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				<p>generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.</p>
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>North Norfolk District Council</p>	<p>November 2017</p>	<p>Given the statutory protection afforded to heritage assets, having a clear understanding of likely harm to heritage assets resultant from this development is important in order for the Planning Inspector to establish the correct weight that should be afforded to heritage protection when balanced against wider public benefits associated with the development.</p>	<p>The onshore project area and onshore works will avoid physical impacts upon known (e.g. previously listed / scheduled) designated heritage assets. Note: this is not possible and the commitment does not apply to the large rural Conservation Areas, previously discussed with NCC HES and HE. As such, with the exception of cable installation works through Blickling Conservation Area (which will need to be sensitively managed and subject to full, thorough and strictly controlled backfilling and reinstatement) no direct physical impacts are anticipated to occur to designated heritage assets (section 28.6.2).</p>
<p>Chapter 28 Onshore Archaeology and Cultural Heritage</p>	<p>North Norfolk District Council</p>	<p>November 2017</p>	<p>The District Council recognises that steps have been taken by Vattenfall to identify heritage assets likely to be affected by the proposal. This would appear to have primarily been in the form of a desktop assessment exercise and therefore extensive further work is required once final design options are developed so that a full understanding of heritage impact can be set out including consideration of any cumulative impacts especially where many number of heritage assets could be affected collectively by proposed elements of the scheme such as at the CRS locations.</p>	<p>The baseline environment as presented in this chapter has been enhanced through the implementation of a staged programme of assessment, survey and evaluation, as outlined in the Method Statement (Royal HaskoningDHV, 2017) and agreed in further consultation with HE and NCC HES. Cumulative impacts are assessed in section 28.8. It is acknowledged that further survey and evaluation (i.e. initial informative stages of mitigation work) will be undertaken within the post-consent stage(s) of the project and followed by additional mitigation measures, as and where required (see section 28.7.2).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 28 Onshore Archaeology and Cultural Heritage	North Norfolk District Council	November 2017	The District Council recognises that steps have been taken by Vattenfall to identify heritage assets likely to be affected by the proposal. This would appear to have primarily been in the form of a desktop assessment exercise and therefore extensive further work is required once final design options are developed so that a full understanding of heritage impact can be set out including consideration of any cumulative impacts especially where many number of heritage assets could be affected collectively by proposed elements of the scheme such as at the CRS locations.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.
Chapter 28 Onshore Archaeology and Cultural Heritage	Roger Budden, St. Peter's Ridlington Church Warden	November 2017	Vattenfall are proposing an AC based system, selected for its cheapness, which will result in a permanent scarring from their CRSs positioned 400m away. Any possibility of a relaxed spiritual or community social event at the church will become impossible due to CRS noise and visual impacts. The masking of the CRSs over a period of 15 years or so appear to be optimistic and would not help our plans. What happens to the church during the time it takes for these masks to mature? Having consulted with others and our MP Norman Lamb, who recently came to view the CRS position as viewed from the church, we implore Vattenfall to do the decent thing on behalf of the community by deploying a DC based system.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a CRS from the project.

Feedback related to Landscape and Visual Impact (Chapter 29 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	Natural England	December 2017	Although the cable corridor will seek to avoid areas of woodland and trees, it will be important for the final ES to include information about where there will be a permanent loss of these key landscape features along the onshore cable route and provide details of the steps that have been taken to minimise the loss.	Chapter 22 Onshore Ecology concludes that only one single, isolated, mature tree will be lost during construction. No semi-natural broadleaved woodland will be removed and, under a worst-case scenario, 3.9Ha of plantation woodland will be cleared. Some mature trees in hedgerows would also be lost although precise numbers for this are as yet unknown . Hedgerows removed along the onshore cable route will be replaced such that there will be no overall loss.
Chapter 29 Landscape and Visual Impact	Natural England	December 2017	We support advance planting where possible to mitigate for visual impacts followed by post-construction planting.	Mitigation planting shown in Figures 29.9 to 29.12 maximises opportunities to implement advance planting.
Chapter 29 Landscape and Visual Impact	Natural England	December 2017	Chapter 29 Landscape and Visual Impact Assessment sets out the considerations for assessment however the District Council's adopted Landscape Character Assessment SPD (2013) should be included in the list of documents to have regard to.	Norfolk and Suffolk Brecks Landscape Character Assessment (2013) has been included within the references in section 29.6.3.
Chapter 29 Landscape and Visual Impact	Natural England	December 2017	We note that site reconnaissance has shown that the potential impact of the project on the Norfolk Coast AONB would be severely limited by a combination of distance, low landform and intervening built form and vegetation.	Noted.
Chapter 29 Landscape and Visual Impact	Natural England	December 2017	We note that site reconnaissance has shown that, despite the proximity of the project to the Broads NP, the extent of mature woodland that separates the two reduces the potential for visibility.	Noted.
Chapter 29 Landscape and Visual Impact	Natural England	December 2017	We agree with the conclusions of potentially significant effects that would arise as a result of the project presented in Table 29.25.	Noted (updated reference in Table 29.20 of Chapter 29 Landscape and Visual Impact Assessment).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	N2RS	December 2017	We have recorded a number of errors (eg incorrect captioning of photomontages/CGI images and inaccuracies on maps) but there has been significant criticism of the photomontages used to visualise the CRS's and their impact on the landscape. The PEIR admits that such photomontages are not necessarily representative of what the human eye sees. This is borne out by our own experience; they present a 'zoomed out' view compared to that of the naked eye. Current screening is not as substantial as suggested, the structures do not appear to be in scale when compared to local landmarks and new planting appears to suggest a completely unrealistic growth rate in this area.	Figures 29.13 to 29.23 now include 53.5-degree field of view frames for all onshore project substation viewpoint visualisations, to more accurately represent the scale of the proposed development experienced from the viewpoint. 90-degree field of view frames will continue to be included in the ES as these are useful in representing the wider context of the baseline. The accuracy of all visualisations has been subject to verification by OPEN.
Chapter 29 Landscape and Visual Impact	Necton Parish Council	December 2017	PEIR chapter 29, section 29.6.4.1, para 173 states that Ivy Todd is a small village. The correct designation is a hamlet with 63 residential properties. Para 174 of the same chapter and section states that Necton is a small town. The correct designation is a village with an area of 15.48 km sq. and a population of just under 2,000 residents. These errors raise a concern about the accuracy of impact evaluation undertaken within this area. We would wish to see this error investigated and evaluations re-assessed.	References to Ivy Todd and Necton have been changed to refer to a hamlet and village respectively.
Chapter 29 Landscape and Visual Impact	Necton Parish Council	December 2017	The combined footprint of the two new sites (National Grid and substations) is significantly larger than initially stated by the developer and the real impact is hard to determine through photomontages alone, particularly as those published have carried a number of errors and omissions. Vattenfall might want to consider	Figures 29.13 to 29.23 include a 90-degree frame computer generated model on its own to demonstrate the appearance of the onshore project substation and National Grid substation extension.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			some more simple visual effects, such as a display that demonstrates the actual height/density of the project at both sites. Such a display for public viewing would go some way to understanding the visual impact and would inform a realistic mitigation strategy.	
Chapter 29 Landscape and Visual Impact	Necton Parish Council	December 2017	Necton and the surrounding villages are recognised as a dark sky area, a tourism asset. Yet, the PEIR does not provide clarity as to how our dark skies will be protected. We would like to see a clear strategy on Vattenfall's intentions regarding light pollution at all stages of construction and operation.	Consideration of the effects of lighting during construction and operation are considered in Chapter 29 Landscape and Visual Impact Assessment section 29.7. Chapter 30 Tourism and Recreation addresses the issues relating to dark skies.
Chapter 29 Landscape and Visual Impact	Necton Parish Council	December 2017	The Secretary of State has stated the EIA process is iterative, and therefore the proposals may change and evolve. For example, there may be changes to the scheme design in response to consultation. Such changes should be addressed in the ES. However, at the time of the application for a DCO, any proposed scheme parameters should not be so wide ranging as to represent effectively different schemes. It is felt that because Vattenfall is proposing two different schemes i.e. HVDC and HVAC, which will not be decided upon until the project construction begins, they are stretching the envelope too far.	Norfolk Vanguard Limited has reviewed consultation received and, in light of the feedback, has made a number of decisions in relation to the project design. One of those decisions is to deploy HVDC cable technology to the UK's National Grid and this removes the need for a HVAC solution.
Chapter 29 Landscape and Visual Impact	Norfolk County Council	December 2017	Necton - The County Council's Landscape Architect has met with the consultant undertaking the LVIA at Necton alongside planning officers from Breckland District Council and agreed the viewpoints for the photomontages / visualisations at that location. The majority of the	Noted.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>photomontages included in the PEIR (Chapter 29) are considered appropriate.</p>	
<p>Chapter 29 Landscape and Visual Impact</p>	<p>Norfolk County Council</p>	<p>December 2017</p>	<p>The proposed mitigation set out in the PEIR is broadly considered satisfactory. However, the proposed mitigation will need to be more fully addressed in the Outline Landscape Ecological Management Plan (OLEMP), which will be produced alongside the Environmental Statement accompanying the submitted application (under Section 56 of the Plan Act 2008).</p>	<p>Detailed information on mitigation planting is included in OLEMS.</p>
<p>Chapter 29 Landscape and Visual Impact</p>	<p>North Norfolk District Council</p>	<p>December 2017</p>	<p>Whilst Vattenfall have committed to seek to mitigate landscape impacts through replacement planting of hedges and trees and planting of new areas of landscaping, for example, around the proposed cable relay station, there are constraints which affect replanting. For example, Vattenfall have indicated in respect of reinstatement that 'Hedgerows would be reinstated in the 54m sections where they would have been removed for open-cut trenching, but hedgetrees and trees would not be permitted to be replanted in these sections or 6-10m either side of the 50m cable easement owing to restrictions of planting over cables'. The Council's Landscape Officer is of the opinion that potentially this will have a significant implication on the residual landscape and visual effects of the onshore cable route. The Landscape Officer is of the opinion that this should be quantified by Vattenfall in order to give a true assessment of how many field trees within</p>	<p>Chapter 22 Onshore Ecology quantifies the loss of hedgerows as follows: The onshore cable route works will result in the temporary loss of approximately 3.3km of hedgerow habitat across 165 hedgerows would occur during the duct installation works. A further temporary loss of approximately 650m of hedgerow habitat across 33 hedgerows would occur during the cable pull works. Mature trees in hedgerows would also be lost although exact numbers for this are as yet unknown. Hedgerows removed to accommodate the onshore cable route would be replanted across the reduced working width of 20m. The removal of the HVAC solution means that there would be no CRS and therefore no permanent or temporary tree and hedgerow losses previously associated with this part of the project.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			hedgerows will be permanently lost and exactly where these will be located. The District Council considers that further work is required by Vattenfall in establishing the likely impact of tree and hedgerow loss and replanting limits within the cable easement corridors (including around the cable relay station) to ensure the effect on landscape character can be properly quantified.	
Chapter 29 Landscape and Visual Impact	North Norfolk District Council	December 2017	The aspirations set out at paragraphs 204 and 205 of the LVIA chapter for the rate of growth of planting is considered to be over-ambitious. The combination of varying ground conditions, exposed sites and prevailing wind will limit this (this position is supported by local knowledge). An estimation of 200mm per annum for core species and 300mm per annum for nurse species would be more realistic. Size of stock has not yet been proposed and should include a mixture.	NNDC's concerns regarding growth rates are specific to the CRS sites in relation to inclement coastal conditions. The original growth rates of 300mm per annum for core species and 400m per annum have been revised to 250 mm and 350mm respectively. These growth rates have been applied in the visualisations in Figures 29.13 to 29.23 to show the height of mitigation planting after a 20 year period.
Chapter 29 Landscape and Visual Impact	North Norfolk District Council	December 2017	Aftercare of planting is a key component of landscape mitigation measures and will be critical to the predicted success of the schemes proposed. This does not appear to have been outlined at this stage but should be fully itemised.	Maintenance of planting is covered in the draft OLEMS and more detailed guidance will be developed prior to planting implementation.
Chapter 29 Landscape and Visual Impact	North Norfolk District Council	December 2017	The District Council recommends that further work needs to be undertaken by Vattenfall to identify those hedgerows / field boundaries that would benefit from trenchless techniques to ensure that these important ecological and landscape features can be retained. This is critical as compensatory planting will not be able to include replacement trees over the buried cable routes.	Through selection of HVDC technology, the width of the onshore cable route has been reduced from 45m to 20m where it crosses hedgerows. All hedgerows removed would be replanted. Trees would not be replaced above the cables, nor within a 6m to 10m wayleave either side of the 20m working width. These parameters are assessed in Chapter 29 Landscape and Visual Impact Assessment section 29.7.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	North Norfolk District Council	December 2017	In terms of long term and permanent effects on the landscape, there will be a need to provide appropriate landscape mitigation particularly where open cut trenches affect field boundaries and landscape features such as mature trees. Vattenfall has indicated they will seek to do this but this would need to be set out within the mitigation strategy . Where possible, the District Council would expect Horizontal Directional Drilling (HDD) to be used if routes through sensitive woodlands or landscapes cannot be avoided.	All hedgerows removed as part of the onshore cable route construction would be replanted. No semi-natural broadleaved woodland would be removed and under a worst-case only up to 3.9Ha of plantation woodland would be removed. Additional sites using HDD have been included to ensure all County Wildlife Sites are avoided. Figure 29.9a, 29.10b and 29.11b show mitigation planting for the onshore project substation, National Grid substation extension and A47 junction. OLEMS sets out and secures the proposals for mitigation planting.
Chapter 29 Landscape and Visual Impact	North Norfolk District Council	December 2017	In terms of delivering wider public benefits, there may be opportunities for Vattenfall to fund wider landscape mitigation to repair historical damage to field boundaries resulting from modern agricultural practices and to enhance local landscape character. This would also have the added benefit of helping improve biodiversity. Wider landscape enhancement could also improve the quality of walking and cycling opportunities in the countryside and enhance tourism to the benefit of the wider economy.	On-site mitigation measures have been designed to strengthen and extend existing field boundaries and form better connected green corridors. Mitigation planting would lead to a net gain in terms of additional hedgerow and woodland planting. Opportunities for wider landscape enhancements are being considered through ongoing development of design guidance for the area. Figures 29.9a, 29.10b and 29.11b show mitigation planting for the onshore project substation, National Grid substation extension and A47 junction.
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	There are no proper accurate and detailed photo montages/ wireframe images to enable a ready visualisation/ appreciation of their visual impact.	All ES figures have been accurately prepared to SNHs guidance standards set out in Visual Representation of Wind Farms Version 2.2 (2017). Figures 29.13 to 29.23 have been updated with 53.5-degree field of view frames to more accurately represent the scale experienced from the viewpoints.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>The local landscape character would be directly affected by the presence of the onshore project substation, with its maximum footprint of 250m x 300m and its maximum height of 25m. This would form a large fenced site containing electrical infrastructure, the most notable component being the HVDC converter halls. <i>'Their scale and mass would appear at variance with the scale and character of the rural landscape. Despite the extent of mitigation planting around the onshore project substation, it would be insufficient in scale to reduce the landscape effect within the operational period.'</i></p> <p>This failure to mitigate the damage to the character of the village or the effect on views shows clearly that this project, especially the HVDC option is too large to fit into an area surrounded by 8 rural communities.</p>	<p>The assessment quoted refers to the effects on landscape character. There are no significant effects on the village of Necton as a whole, as visibility of Norfolk Vanguard substation and the National Grid substation extension are limited. There is the potential for residual effects around the eastern settlement edge, but these will not redefine the character of the village. Mitigation planting will provide screening along the edges of the National Grid substation extension and onshore project substation which face towards Necton. In Chapter 29 Landscape and Visual Impact Assessment section 29.7, the assessment of Viewpoint 8 and Viewpoint 9 represent the potential effects of the project on residents in Necton.</p>
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>PEIR – Chapter 29 - 203</p> <p>The onshore project substation site benefits from some substantial existing hedgerows and woodland blocks within the local area. However, Norfolk Vanguard Limited has committed to additional planting to further screen both the Norfolk Vanguard and Norfolk Boreas onshore project substations. The location of this proposed additional planting is provided in Figure 5.3. Further information on the proposed screening is provided in Chapter 29 Landscape and Visual Impact Assessment.</p> <p>Other parts of the PEIR show that 1km of hedges will be removed, which negates the effects of</p>	<p>The loss of hedgerow on the substation site would be minimised and, overall, more hedgerow would be gained than lost. Hedgerows would be planted as a double row of whips and with an anticipated growth rate of 350mm per annum on top of a baseline height of 500mm, in 3 to 5 years, the hedge is estimated to grow to a height of 1.5 to 2.2m, sufficient to infill gaps in low to medium hedgerows and 2.2m to 4m in 5 to 10 years, sufficient to infill gaps in high hedgerows. Figure 29.9a, 29.10b and 29.11b show mitigation planting for the substation and National Grid substation extension. The effects of the mitigation planting are addressed in Chapter 29 Landscape and Visual Impact Assessment section 29.7.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>much of the 'additional' planting, which is in fact not additional as in parts it replaces hedgerows torn up. In addition to this the hedging to be removed is mostly mature of over 20 years standing and should be protected from this development. These plans are in opposition to current government initiatives to protect hedgerows and prevent soil structure damage.</p>	
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>Ivy Todd is a small farming hamlet that will be irrevocably changed by the insertion of an admitted massive industrial project.</p>	<p>While there will be some localised visual effects, the enclosed nature of the surrounding landform and mature tree cover moderates the overall effect on visual amenity. The Norfolk Vanguard onshore project substation is located approximately 600m from the village and would be mostly set behind the intervening ridge such that the full extent of the development would not be evident. In Chapter 29 Landscape and Visual Impact Assessment section 29.7, the assessment of Viewpoint 10 represents the potential effects of the project on residents in Ivy Todd.</p>
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>PEIR - Chapter 22 – Table 22.2 Breckland Council state: Appropriate landscaping schemes to mitigate against the landscape impact of and complement the design of new development will be required, where appropriate. It has been admitted in the PEIR document (Chapter 29 – Table 29.18) the mitigation against the landscape impact will be unsatisfactory for the operational life of the substation. We object to the proposed siting on these grounds.</p>	<p>Figures 29.13 to 29.23 show the viewpoint visualisations with the revised mitigation planting. The planting will gradually reduce landscape and visual effects on surrounding receptors as it grows. In the localised areas where significant effects would arise, these effects would be mitigated between 5 and 25 years depending on the location of the planting relative to the project.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>PEIR – Table 4.3 Application of Horlock Rules to onshore project substation.</p> <p>The onshore project substation benefits from relatively substantial existing hedgerows and woodland blocks within the local area (e.g. Great Wood and Necton Wood). These would provide a level of mitigation of landscape and visual effects from the outset and can be strengthened with planting proposals during the phases of the proposed project to ensure robust screening. However, this is contradicted by:</p> <p>PEIR – Chapter 29 - Table 29.18</p> <p>Despite the extent of mitigation planting around the onshore project substation, it would be insufficient in scale to reduce the landscape effect within the operational period.</p> <p>We object to this project being given approval when it is obvious that it cannot be screened sufficiently within its operational lifetime.</p>	<p>In Chapter 29 Landscape and Visual Impact Assessment section 29.7 the assessment considers a great number of different landscape and visual receptors. The existing woodland and hedgerows help mitigate effects from certain directions around Norfolk Vanguard onshore project substation and National Grid substation extension. The extract from Table 29.18 is not a general comment but is part of an assessment made in respect of a particular receptor which has been taken out of context. Improvements to the mitigation planting mean from some representative viewpoints an appropriate relative scale would be achieved to mitigate the effects by 10 or 20 operational years of the project.</p>
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>PEIR – Chapter 29 - 29.6.4.1</p> <p><i>‘Necton is a small town located to the south-west of the onshore project substation.’</i></p> <p>This is not correct. Necton is a village not a town and has the character of a village not a town. It has a Parish Council, and not a Town Council. It has the population and housing/business pool of a village, and this cluster of developments would increase its size by almost 50%.</p> <p>Designating Necton as a town rather than a village distorts the matrix evaluation of the effects of the substation on its surroundings. The evaluation should be redone correctly.</p>	<p>References to Ivy Todd and Necton have been changed to refer to a hamlet and village respectively and these changes have been taken into account in the assessment.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>PEIR – Chapter 29 - 29.6.4.1 Ivy Todd is a small village set to the south of the onshore project substation.</p> <p>This is incorrect. Ivy Todd is a tiny hamlet that comes under Necton Parish Council. It will be badly affected by the substations in terms of landscape, character change, noise and light pollution and increased flooding risk. A town has more noise, more buildings, more people, and more roads and would not be as badly affected as Necton will be by a project of this size. This incorrect assessment of Vattenfall's suggests the possibility of the matrix being manipulated to their advantage and should be investigated.</p>	References to Ivy Todd and Necton have been changed to refer to a hamlet and village respectively and these changes have been taken into account in the assessment.
Chapter 29 Landscape and Visual Impact	NSAG	December 2017	West End is a hamlet that comes under Bradenham Parish Council, but its extremely close proximity to Ivy Todd, and the dip in the landscape, makes it vulnerable to both views and flooding in addition to the light and noise issues. Its residents have been missed out by Vattenfall and they have not received any information from them.	Specific reference is not made to the hamlet of West End in this chapter as the ZTV shows there would be no visibility of the Norfolk Vanguard substation or the National Grid substation extension from this settlement. It is therefore not relevant to consider it within this Chapter. West End is considered in Chapter 20 Water Resources and Flood Risk and Chapter 25 Noise and Vibration.

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Chapter 29 Landscape and Visual Impact	NSAG	December 2017	<p>PEIR – Chapter 29 - 29.6.4.2 The A47 section of relevance to the assessment of the onshore project substation sites lies between Little Fransham in the east and Necton in the west. This section provides access into Necton National Grid substation, although visibility of this large-scale development from the A47 is reduced by the extent of road-side planting. The bare trees filter views in the winter and the leafed trees largely screen views in the summer.</p> <p>This is not correct. The trees planted screen the view when approaching from Swaffham direction of the A47, but when approaching from Dereham direction the entire site is clearly visible as there are no trees blocking the higher ground that the substations stand on – nor could this be able to be mitigated by trees in the foreseeable future as it is too high in the landscape, and as the PEIR has confirmed, satisfactory mitigation is not possible. In the winter, 95% of the site is visible from all directions. The proposed area for the National Grid extensions and the Vattenfall substations is situated between Necton, Ivy Todd-Necton, West End, Holme Hale, Ashill, Little Fransham, Little Dunham and Spicer’s Corner, all of which have sight of, and are affected by the existing infrastructure. It is also visible in all seasons when exiting Swaffham onto the A47. With the new National Grid extensions, almost one third of a mile of NG infrastructure will be clearly seen, running in a continuous line. The two new substations will also be in clear view, as can be</p>	<p>In respect of views westbound on the A47 from Dereham, the woodland planting on the immediate south-side of the road will screen views of the existing substations within 5 years regardless of the substations being on higher ground. This is because the planting is close to the road and wide enough to form an effective screen. Whilst it is agreed that that the existing substations are visible from more open sections of the A47, clear views are not gained from 95% of this section of road in both directions. Norfolk Vanguard and Norfolk Boreas substations would only be visible from retained openings and will largely be screened by the roadside planting that within 5 years will mature to screen views. Chapter 29 Landscape and Visual Impact Assessment section 29.7 presents the assessment of effects on Viewpoint 5 and Viewpoint 6 which are representative of the views from the A47.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			<p>seen from the photographic simulations displayed from Spicer's Corner – another hamlet whose residents have been mistakenly forgotten by Vattenfall.</p>	
Chapter 29 Landscape and Visual Impact	Orsted (Hornsea Project)	December 2017	<p>The published timescales for the application for consent for the Hornsea Three and Norfolk Vanguard Offshore Wind Farms are the same – Quarter 2 2018. As a result, it may be difficult for both projects to include the results of the updated application Environmental Impact Assessments within each other's cumulative assessments. We would therefore request early sight of updated outputs of the Norfolk Vanguard assessments as soon as these are available such that we can conduct as thorough a cumulative assessment as possible at the point of application (where relevant). We are willing to share our updated environmental information at an early stage also.</p>	<p>Chapter 29 Landscape and Visual Impact Assessment section 29.8 updates the cumulative assessment in line with Orsted's cumulative data on Hornsea Project Three Offshore Wind Farm. The area within which a significant cumulative effect could potentially arise, occurs to the north-east of Reepham, in the localised area where the Hornsea Project Three and the Norfolk Vanguard onshore cable routes cross.</p>
Chapter 29 Landscape and Visual Impact	Historic England	December 2017	<p>We note the details 29.2 paragraph 3. As discussed above we are of the view that further visualisations are needed, and that these are specifically produced to illustrate the views to and from designated heritage assets, and other historic environment features. Images are required for both of the Cable Relay Station site options and for the substation, in particular views</p>	<p>Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			that provide a representative assessment of St Peter's Church, Ridlington, All Saint's Church, Walcott, and St Mary's Church, and from the monuments to the south east of Necton.	
Chapter 29 Landscape and Visual Impact	Historic England	December 2017	Historic Environment receptors need to be included in the LVIA maps and the viewpoints that will be used to illustrate key views also recorded. Better integration with chapter 28 is therefore needed.	Chapter 28 Onshore Archaeology and Cultural Heritage presents an assessment of Historic Environment receptors with five representative cultural heritage viewpoints presented in the associated figures.
Chapter 29 Landscape and Visual Impact	National Trust	December 2017	The Trust is pleased to see that the proposed route would avoid the Registered Park and Garden (Blickling Hall) and would not impact upon the setting of the listed mansion.	Noted.
Chapter 29 Landscape and Visual Impact	Breckland District Council	December 2017	Breckland Council influences design through Policy DC16 of the Core Strategy. This requires that development should complement the natural landscape. Given the perceived scale of the development near Necton, achieving an acceptable development of the proposed proportions when it would be sat in the distinct landscape of the District, which is protected by Policy CP11, will be very difficult. The Council also has a duty to maintain the amenities of an area for the benefit of the residents as specified in Policy DC 1.	Figures 29.9a, 29.10b and 29.11b show the on-site mitigation measures designed to help integrate the project with the local landscape. Figures 29.13 to 29.23 show this mitigation planting in respect of the representative viewpoints.
Chapter 29 Landscape and Visual Impact	Breckland District Council	December 2017	The exact extent of the harm is not entirely clear yet and more photomontages and visualisations are required in the forthcoming Outline Landscape Ecological Management Plan which will accompany the application and the Environmental Statement. This should include proposals for an	Figures 29.21 to 29.23 present additional viewpoints and photomontages for the substation and National Grid substation extension. Figures 29.9a, 29.10b and 29.11b show improved mitigation planting proposals.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			appropriate strategic, substantial and robust landscaping scheme. More detailed comments are set out in the attached "Review of Landscape and Visual Impact Assessment" document.	
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	With respect to landscape sensitivity in para.32, the terms high to low are used but without a further explanation of the criteria applied to each rating.	Appendix 29.1 Methodology explains how the sensitivity rating combines both the value component and susceptibility component, such that the resultant sensitivity rating can represent a range of different criteria which are difficult to capture in single definitions. Reference should be made, instead, to the separate components that combine to determine sensitivity in respect of each receptor.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	I note, however, that the methodology has not provided any definitions of impact significance which I draw attention to in my review of the LVIA. The EIA Methodology in Chapter 6 Table 6.2 suggests that this is the process that is to be followed so the omission of the terms and definitions is queried.	Appendix 29.1 Methodology presents the definition of impact significance in relation to landscape character in paragraph 29.4.2.10 and in relation to views in paragraph 29.5.1.10.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	The establishment of the visual baseline is reasonably described although better cross referencing to section 29.7.2 with respect to the mapping of the Zone of Theoretical Visibility (ZTV) for visualisations and cumulative effects, would improve the reading of these sections as they are so closely interrelated.	Appendix 29.1 Methodology cross references to section 29.7.2 within the description of the visual baseline.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	It is not clear if all viewpoints have been agreed with the relevant local authorities or if further digital mapping for cumulative effects is to be provided in this document.	Figure 29.7 has been added to show the mapping of cumulative developments. Viewpoint selection has been an ongoing process as comments have come through from Public Information Days , Environment Topic Group meetings and PEIR review. The four additional viewpoints have been included to reflect comments from consultees. All viewpoints are assessed in Chapter 29 Landscape and Visual Impact Assessment, section 29.7.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	With respect to the ZTV it is not clear what mapping data has been used. It is noted on the figures that OS Vector Map District have been used to include woodland features. The process and mapping used, e.g. OS Terrain 5, could be explained, especially if 'visual buffers' such as woods have been taken into account.	Mapping data used is Ordnance Survey Terrain 5. Woodland has been taken into account in the production of the ZTV. Chapter 29 Landscape and Visual Impact Assessment, section 29.7.2 describes the detail of the graphic productions.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	The methodology states that they have not adopted the 53.5-degree frame views but have opted for the 90-degree frames. My understanding is that former are the views that should be held closer than arm's length, arced and viewed with one eye closed, to provide the appropriate viewing context. In para.106 the opposite is stated which should be clarified.	Figures 29.13 to 29.23 now show 53.5-degree field of view frames for each viewpoint to present a more realistic scale of what would be experienced from the viewpoint.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	Reference is made to Visual Nature Studio software in para.104 being used to create computer generated images. It would be helpful if further information could be provided about this software and its appropriateness as, to my knowledge, it is not as regularly used in the UK as say Vectorworks or Rhino.	Visual Nature Studio works with the cylindrically projected photographs that are required as part of SNH's visualisation standards and also works with the earth's curvature. These measures ensure a more accurate representation than could be achieved with other software. Section 29.7.2 of Appendix 29.1 Methodology explains the graphic productions in more detail.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	It is noted that the visualisations prepared should be viewed properly by printing to A1 width, para.99. I do not know if any have been issued at this size or used at consultation events. I would suggest that a viewpoint pack as the SNH guidance advises, could be prepared for a project of this significance, which are suitable for taking to site to compare the view. This should not require wide prints if a narrower angle of view is applied and which would be easier to use in the field.	Visualisations have been printed to correct dimensions for consultation events, PEIR submission and EIA submission. Viewpoint packs can be provided on request.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	In addition, the visualisations do not provide a wire frame only view. As the SNH and LI guidance advise, the accuracy of a photomontage may be illustrated by the means of a wireline image which incorporates sufficient topographic or other features to allow a comparison to be made between the wireline and the photograph.	The visualisations have been prepared using a computer-generated model, not a wireframe. Figures 29.13 to 29.23 include the computer model to allow a comparison to be made with the photograph.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	For some visualisations, I would suggest that better weather conditions could have been sought to improve the clarity of the images.	Figures 29.13 to 29.23 present updated photography taken during better weather conditions. These are winter shots to ensure worst case scenario is represented.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	It is also noted with respect to landscape character, that the LVIA intends to refer to the local level Breckland District Landscape Character Assessment (May 2007) as this provides the basis for determining the effects of development upon landscape character.	Comments from other consultees have queried the use of the 2007 LCA over the 2013 LCA – but earlier comments requested that the 2007 be used as it is considered more appropriate for the purposes of the assessment.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	Definitions to some of the terms used are included, for example in Tables 29.3 and 29.4 with respect to the definition of value and susceptibility levels for landscape and visual receptors which is helpful but, in my view,	Chapter 29 Landscape and Visual Impact Assessment, section 29.4.1 presents separate definitions of value and sensitivity in respect of landscape and visual receptors.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			combining landscape and visual together is not as clear as defining the terms separately.	
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	In my view it would be worth consulting the NCA Profile to ensure that mitigation strategies are consistent with the SEOs, subject to consultation with the relevant statutory bodies.	Chapter 29 Landscape and Visual Impact Assessment, section 29.6.2 includes reference to National Character Area Profiles and Strategic Environmental Objectives. Figure 29.2 includes National Character Areas on landscape character maps.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	Extensive extracts are provided but I consider greater emphasis in some instances could have been given to the landscape strategies and guidelines that are provided in the LCA for the reason given above with respect to the NCA.	Chapter 29 Landscape and Visual Impact Assessment, section 29.6.2 includes reference to the landscape strategies and guidelines provided in the Landscape Character Assessment.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	Landscape designations and registered parks and gardens are suitably referenced and mapped but there would appear to be little cross referencing to Ecological or Historic Landscape Character issues which the section would benefit from as there is a synergy between them, the only brief cross reference is in 29.9 Inter-relationships.	Cross referencing to Ecology and Cultural Heritage Chapters has been included in Chapter 29 Landscape and Visual Impact Assessment, section 29.9, in respect of hedgerow and tree losses and mitigation planting, and the landscape setting of heritage features.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	Whilst there is much information contained in the summary tables, they are not the easiest to understand. Due to the volume of written text it would be useful to either emphasis the text (e.g. in bold) or re structure it slightly to make it clearer when an assessment is being made, e.g. with respect to sensitivity or value. Alternatively, this could be summarised in the tables in order that the process arrived at in terms of the significance of effects is easier to understand using table headings. For instance, with respect to landscape effects this covers issues of the type and scale of	Key findings in Table 29.21 have been highlighted in bold and a fuller explanation of assessments leading to significant effects added. Additional columns to tables have not been added as existing headings correlate with the process undertaken in the methodology, from baseline to sensitivity to magnitude of change to significance of effect and finally duration of effect.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			change, its geographical extent, receptor sensitivity and duration and reversibility.	
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	The methodology states that in assessing the magnitude of change, size or scale, geographical extent and duration and reversibility are considered separately. In the assessment tables, however, this does not seem to have occurred. The dialogue offered is reasonably comprehensive, but consideration could be given to subdividing the text between scale and geographic extent.	In Tables 29.11 to 29.14 and Tables 29.17 to 29.18, geographical extent is used to refer to the extent of the landscape or visual receptor that would be affected and not the overall geographical extent of the impact as a result of the project. The tables define the size or scale of the effect as the magnitude of change and then that effect is attributed a geographical extent and duration in the end columns. The text between scale and geographic extent is already clearly subdivided.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	What is an omission to me is how the Significance of Effects has been arrived at. The methodology correctly advises that this is arrived at by combining the judgements on sensitivity and magnitude of change using the matrix provided plus professional opinion. No reference in the assessment is made to the combined effects rating and there is no definition of the impact significance terms. For the reasons I have already stated in my comments on the methodology, this appears to be inconsistent with the EIA methodology and I suggest that further justification for this approach is required.	The impact significance for both landscape and visual receptors occurs where the project becomes a defining feature in respect of the character of a defined landscape area, or the visual amenity of the visual receptors. This is set out in Chapter 29 Landscape and Visual Impact Assessment, Table 29.8 and explained in Appendix 29.1 Methodology.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	It also not clear if the effects of lighting have been sufficiently considered at both construction and operational stages. Visualisations may be required at particularly sensitive locations to indicate the	In Chapter 29 Landscape and Visual Impact Assessment, section 29.7.3 and 29.7.4 the potential effects of construction and operational lighting have been included within the assessment where appropriate.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			potential worse case scenarios during the construction process, particularly where they are of greater duration.	
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	An overview of mitigation planting is given in para.204 and it is assumed that a greater level of detail will be provided with respect to planting specification, mixes and management in the final submission.	Figures 29.9a, 29.10b and 29.11b show more detail of mitigation planting. OLEMS includes information on planting mixes and management. Detailed planting plans will be prepared prior to construction.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	I note that significant effects are assessed for localised areas of the different character areas affected and it could be advantageous to indicate graphically their extent for clarity.	In this type of landscape, the thresholds between significant and not significant cannot be defined by a hard line as, in most cases, there is a gradual transition from one to the other. The narrative defines these areas sufficiently for the purposes of the assessment.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	It is noted that some viewpoints are from remnant public rights of way and it's understood a strategy is in preparation to consider re-establishing routes so that they link up. It would be helpful if this could be taken into consideration in the mitigation proposals.	Mitigation measures are contained within the onshore project substation, National Grid substation extension and A47 slip road sites as shown on Figures 29.9a, 29.10b and 29.11b. The potential for off-site mitigation is being explored within work on design guidance . Chapter 30 Tourism and Recreation addresses impacts on PROWs.
Chapter 29 Landscape and Visual Impact	CAPITA on behalf of Breckland District Council	December 2017	With regard to sensitivity, walkers are recorded as medium sensitivity. I would not agree with this rating and would consider them of high sensitivity as they are likely focused on the countryside around them. For Viewpoint 3 (Figure 29.24) for example, using purely a matrix approach this could arrive at the effect being significant which, with regard to the HVDC option is, in my view arguably the case. In my opinion this is an example of where the use of impact terms with	Following GLVIA2 this might have been the case. With GLVIA3, susceptibility is combined with value in the overall assessment of sensitivity, and in the example of Viewpoint 3, susceptibility is moderated by the existing presence of energy infrastructure visible from Lodge Lane. Furthermore, the denuded appearance of this landscape reduces the value and the overall sensitivity of the views walkers experience. The assessment of Viewpoints 2 and 3 are presented in section 29.7.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			definitions would have aided the assessment process.	
Chapter 29 Landscape and Visual Impact	Broadland District Council	December 2017	Chapter 29 Landscape and Visual Impact Assessment sets out the relevant considerations for assessment, however the District Council's adopted Landscape Character Assessment SPD (2013) should be included in the list of documents to have regard to.	In Chapter 29 Landscape and Visual Impact Assessment, section 29.6.3 the 2013 LCA has been added to the list of references.
Chapter 29 Landscape and Visual Impact	Broadland District Council	December 2017	The proposed construction of the cable route of the Norfolk Vanguard Offshore Wind Farm together with the cumulative construction of the Norfolk Boreas Wind Farm and the anticipated construction of the cable route of the Hornsea Project Three Wind Farm will all take place in the relative proximity of one another in and around Salle Park and Reepham and the assessment methodology should identify how the visual and constructional impacts will be minimised and a build programme managed to ensure that these impacts will be reduced through a co-ordinated approach.	Chapter 29 Landscape and Visual Impact Assessment, section 29.8 includes more detailed information and assessment in respect of the potential cumulative effects adjacent to Salle Park.
Chapter 29 Landscape and Visual Impact	East Rushton Parish Council and Residents	December 2017	The largely desk-based research, which defines it (the local landscape) as of only 'moderate' importance, completely fails to recognise its value.	This landscape is not covered by any national, district or local level designations which would otherwise denote a special importance or value. Whilst it is of local value, compared to other landscapes, such as AONB's, this value is moderate rather than high. Appendix 29.1 Methodology explains the relative value attributed to landscape character.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Chapter 29 Landscape and Visual Impact	Norfolk Coast Partnership	December 2017	The current 2014-19 Norfolk Coast AONB Management Plan has a Policy (PC5) to 'Support the development of renewable energy in the area in ways and locations that contribute to the area's local economy and jobs and maintain its natural beauty.' However, the National Planning Policy Framework emphasises that the impact of a proposed development is an important consideration, including the cumulative landscape and visual impacts. It states that 'Great weight should be given to conserving landscape and scenic beauty in National Parks, the Broads and Areas of Outstanding Natural Beauty, which have the highest status of protection in relation to landscape and scenic beauty'.	The potential effect of the proposed development on landscape designations such as AONBs and NPs has been scoped out of the assessment owing to the absence of any material visibility from these areas. This position was presented in PEIR and did not give rise to any comments or objections from consultees other than the comment to the left made by Norfolk Coast Partnership.

Feedback related to Tourism and Recreation (Chapter 30 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant
Chapter 30 Tourism and Recreation	Dereham Town Council	2017	Responses regarding crossings of Dereham Footpaths (FP)9, FP19, FP20, Hoe FP5, and unclassified road 35131	Impacts to PRoWs are covered in Section 30.8. A full list of all PRoWs that the project interacts with is included in Appendix 30.1 and visualised in Figure 30.3.
Chapter 30 Tourism and Recreation	East Rushton Parish Council and residents	2017	Concerned that the photo montages of the Cable Relay Station (CRS) proposed at PEIR stage did not capture the true character of the area	The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer required by the project and so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant
Chapter 30 Tourism and Recreation	N2RS	2017	Strong response against the need for a CRS and in favour of HVDC system	The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer required by the project and so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.
Chapter 30 Tourism and Recreation	Necton Parish Council	2017	Request detail of how a "dark sky area" will be protected from onshore substation.	This has been included in Sections 30.6 and 30.8.
Chapter 30 Tourism and Recreation	Necton Parish Council	2017	Requests that four holiday-let businesses are included with tourism and recreational asset assessment.	This information has been checked against public information. Figure 29.7 of Chapter 29 Landscape and Visual Impact Assessment shows that 3 of 4 businesses may be affected. This has been included in section 30.8.3.2.4.
Chapter 30 Tourism and Recreation	North Norfolk District Council	2017	Accepts that the long-term impacts of the project would be "pretty benign" but requests that any impacts are minimised by appropriate programming and noise protection.	Section 30.8 describes mitigation of potential impacts to tourism receptors.
Chapter 30 Tourism and Recreation	NSAG	2017	Four holiday let businesses have not been included within the Tourism Asset assessment.	This information has been checked against public information. Figure 29.7 of Chapter 29 Landscape and Visual Impact Assessment shows that 3 of 4 businesses may be affected. This has been included in Section 30.8.3.2.4.
Chapter 30 Tourism and Recreation	St Peters Ridlington	2017	Objection to the CRS due to its impact on the amenity and landscape character of the surrounding area.	The selection of the HVDC electrical solution means that an onshore Cable Relay Station (CRS) is no longer required by the project and so has led to the removal of tourism and recreational impacts relating to the CRS. This is described in Chapter 4 Site Selection and Assessment of Alternatives.
Chapter 30 Tourism and Recreation	Suffolk County Council	2017	Request to include additional projects in CIA.	These have been addressed in Section 30.9

Feedback related to Socio-economics (Chapter 31 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 31 Socio-economics	Aylsham Town Council (online questionnaire)	December 2017	The Town Council welcome the potential for employment and training this project should bring and would like to see some assurances that this will be spread to the rural areas and not concentrated in Norwich and Kings Lynn	The worker movement assessment in Chapter 24 Traffic and Transport shows that there is potential for workers to be recruited from across the New Anglia LEP. Norfolk Vanguard Limited is also actively engaging in the development of a local supply chain (section 31.7.2).
Section 31 Socio-economics	Broadland District Council	December 2017	Broadly supports the development of renewable energy. Requests further identification of opportunities arising for local employment.	Direct and indirect job creation is covered in section 31.7.
Section 31 Socio-economics	East Rushton Parish Council and residents	December 2017	Concerned that the photo montages of the Cable Relay Station (CRS) proposed at PEIR stage did not capture the true character of the area	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.
Section 31 Socio-economics	Fransham Parish Council (online questionnaire)	December 2017	<i>"We support the group whose aim is to bring a better broadband service to our area . We would encourage Vattenfall to help in this enterprise. We are not alone in these aspirations as we have noted that during previous consultations on the proposed windfarm development, a number of people along the length of the identified route have suggested this as a possible opportunity and community benefit."</i>	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 31 Socio-economics	Happisburgh Parish Council	December 2017	The project must not effect properties and the council will not accept an HVAC option for this reason. The council urges Vattenfall to use Long Drill HDD at landfall. Beach road car park is essential for village income and any closure must have a long notice period, preferably with compensation. The council requests a community fund. The council feels that due to the location of CRS option that the area will be immensely effected. The council also urges landfall for both Vanguard and Boreas to be made at the same time.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity including: <ul style="list-style-type: none"> • A decision to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project. • The use of long HDD at landfall.
Section 31 Socio-economics	No To Relay Station (N2RS)	December 2017	Completely objects to Cable Relay Station options.	Norfolk Vanguard Limited has reviewed consultation received and in light of the feedback, has made a number of decisions in relation to the project design in order to deliver an environmentally sustainable project generating climate smart, low cost green electricity. One of those decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the UK's National Grid and this removes the need for a Cable Relay Station from the project.
Section 31 Socio-economics	National Farmers Union	December 2017	Requests further information on phasing of construction because some farms will not be able to lose a strip of land for the full 6 year duration of the construction. Would prefer HVDC and would like more information on reinstatement/construction so farmers can put land back to use as quickly as possible.	Following feedback, one of the decisions is to deploy High Voltage Direct Current (HVDC) cable technology to the project and this removes the need for a 100m route from the project. Phasing of the project is covered in section 31.7 and described in detail in Chapter 5 Project Description.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 31 Socio-economics	Necton Parish Council	December 2017	<p>Has received many complaints regarding the siting of the onshore project substation. PEIR states that Ivy Todd is a small village. The correct designation is a hamlet with 63 residential properties. Para 174 of the same chapter and section states that Necton is a small town. The correct designation is a village.</p> <p>Requests that Norfolk Vanguard Limited provides some form of financial compensation.</p>	<p>The information provided by Necton Parish Council has been reviewed as part of the ES drafting. A full account of the site selection and assessment of alternatives considered can be seen in chapter 4 of this ES.</p> <p>Norfolk Vanguard Ltd will work with our neighbours – those communities hosting our project infrastructure over the long term – to acknowledge appropriately the role they play in accommodating Nationally Significant green energy infrastructure that benefits the global environment and delivers UK policies and strategies. Very preliminary exploration is underway about how best to enter into dialogue about appropriate strategic local investments that could for example contribute to local resilience and sustainability. Such dialogue will follow appropriate guidance and Vattenfall Wind Power Limited’s own proven track record of effective delivery in this area, as a separate discussion from the engagement on shaping the project.</p>
Section 31 Socio-economics	NHS England	December 2017	<p>The development may have an impact on healthcare provision in the area and its implications, if unmitigated, could be unsustainable. The proposed development must therefore, in order to be considered under the ‘presumption in favour of sustainable development’ advocated in the National Planning Policy Framework, provide appropriate levels of mitigation.</p>	<p>Health care provision is covered in Chapter 27 Human Health.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 31 Socio-economics	Norfolk County Council and North Norfolk District Council	December 2017	<p>County Council officers have had good engagement with Norfolk Vanguard Limited in terms of maximising the wider economic benefits from the project.</p> <p>The County and District Councils are working with all energy companies and the New Anglia LEP to promote this sector and develop a Skills Strategy for the types of skills required for young people in schools and colleges.</p> <p>The County Council strongly encourage, on economic development grounds and supporting the Norfolk economy, Vattenfall Wind Power Ltd to use the Port facilities at Great Yarmouth.</p>	<p>Norfolk Vanguard Limited intends to continue its high level of engagement with the council so as to maximise economic benefits and develop an effective skills strategy.</p> <p>Direct and indirect job creation and Additional Benefits are covered in section 31.7.3.</p> <p>Norfolk Vanguard Limited have are entering into initial agreements with local Ports to explore opportunities in detail.</p>
Section 31 Socio-economics	Necton Substation Action Group	December 2017	Strongly opposes the development of the onshore project substation.	<p>A full site selection process has been undertaken to ensure the project avoids community infrastructure, as detailed in Chapter 04 Site Selection and Assessment of Alternatives.</p> <p>Feedback has been considered as part of ongoing consultation and is documented in the Consultation Report.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 31 Socio-economics	Ørsted	December 2017	<p>Hornsea Three would welcome inclusion of socio economic impact assessment in relation to the offshore construction element in respect of national/international and local/regional socio-economic effects.</p> <p>Hornsea Three would welcome consideration of:</p> <ol style="list-style-type: none"> 1) the amount of GVA supported by construction activity; 2) CIA relating to demand for housing, accommodation and local services in the Local Impact Areas 	<p>Socio-economic impact assessment and Cumulative Impact Assessment have been included under section 31.7 and 31.8 respectively.</p> <p>GVA has not been calculated as this would require detailed information about employment in the offshore wind sector that is not available from official sources, such as ONS. Furthermore, Norfolk Vanguard Limited feels that focussing on GVA would not capture the non-market services within the affected communities or the likelihood that employment opportunities would be realised.</p> <p>Norfolk Vanguard Limited has agreed through stakeholder consultation that demand for housing would be scoped out of assessment. Temporary accommodation demand is covered in Chapter 30 Tourism and Recreation. Impact on local health services is covered in Chapter 27 Human Health.</p>
Section 31 Socio-economics	Suffield Parish Council	December 2017	Requests the inclusion of broadband with the cable corridor.	Rural Norfolk has some of the slowest broadband speeds in the UK. Norfolk Vanguard Limited has been approached by a local group Broad Band for East Rushton (BB4ER), who requested assistance to improve broadband speeds by including necessary broadband services along the same route of onshore infrastructure as for the wind farms. Whilst this broadband delivery would be a separate process to the obtaining of consent for the offshore wind farms, it potentially affords an excellent opportunity to utilise the same area of land to install much needed services. Norfolk Vanguard Limited is considering the exploratory ideas of Better Broadband for East Rushton.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 31 Socio-economics	Suffield Parish Council	December 2017	The County Council also recognises the potential positive benefits Norfolk Vanguard presents and would encourage Norfolk Vanguard Limited to maximise and support the uptake of local socio-economic benefits through targeted enhancement and initiatives.	Norfolk Vanguard Limited welcomes and agrees with the comment from Suffolk County Council. Details of Additional Benefits in this regard are included in section 31.7.3.

Feedback related to Offshore Cumulative and Transboundary Impacts (Section 33 of the ES)

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	MMO	11th December 2017	This study does show considerable overlap between the envelope of effects on hydrodynamics (in terms of wave height) for an adjacent development (East Anglia Three) and Norfolk Vanguard East. The assessment essentially concludes that effects of each individual development are negligible, and that the cumulative impacts are negligible also. However, the method used (simple extension of modelling results for a third individual development) does not convincingly support this conclusion since the original results did not assess in-combination effects.	The approach to cumulative operational effects on waves was based on expert assessment (overlapping of zones of potential influence) as described in section 8.8.3. The modelling results of East Anglia ONE were used in the expert assessment merely to show that changes to waves due to the presence of foundation structures would be small in magnitude and localised in spatial extent (i.e. restricted to the vicinity of each foundation), and that this applies to cumulative layouts as well as for individual wind farm layouts.
Section 33 Offshore Cumulative and Transboundary Impacts	The Wildlife Trusts	8th December 2017	TWT has concerns regarding the cumulative impacts of repeated cable installation and suggest further work is required on the cumulative impacts of Norfolk Vanguard and Norfolk Boreas. There is an opportunity to reduce cumulative impacts by considering embedded mitigation such	Following the commitment of both projects to HVDC transmission technology the cumulative impacts have been greatly reduced. Further work has been undertaken to understand the cumulative impacts especially within the SAC Appendix 8.1 of the ES and

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
			as planning the cabling infrastructure in advance for both projects.	Appendix 7.2 of Information to inform HRA (document 5.3).
Section 33 Offshore Cumulative and Transboundary Impacts	Eastern IFCA	11th December 2017	The Eastern IFCA would encourage further assessment on an ongoing basis of the cumulative impacts of all Southern North Sea wind farm activity, as well as other activities including aggregate extraction activities. The impacts of these projects on the marine environment and fisheries should be assessed in-combination, highlighting any potential cumulative effects associated with the licence application.	This is understood, however this is not within the remit of a single project and would need to be undertaken at a strategic level and under the guidance of Regulators.
Section 33 Offshore Cumulative and Transboundary Impacts	Eastern IFCA	December 2017	Sandeels rely on sandbanks and other sandy substrata similar to those found in the Haisborough, Hammond and Winterton SCI (Ellis et al., 2012). There is a potential pathway for the species to be impacted by the construction and operational work, as well as by the habitat loss associated with unburied, protected cable, however the PEIR has identified these as not significant. This should be further considered to address the cumulative impacts of the project on sandeels with other plans and projects in the Southern North Sea.	<p>Consideration has been given to the potential impacts of the construction and operation phases of the Project on sandeels (Section 11.7.411.7.3 and Section 11.7.511.7.4).</p> <p>The assessment carried out in respect of permanent loss of habitat takes account of the potential habitat loss as a result of the footprint of the project, including areas of unburied cable where protection may be required (Section 11.7.5.111.7.4.1</p> <p>An assessment of the potential cumulative impacts of the Project on sandeels, and other fish and shellfish receptors, in conjunction with other developments in the Southern North Sea, has been undertaken and is presented in Section 11.8. All potential impacts assessed for the Project alone have also been considered for assessment of cumulative impacts .</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	Eastern IFCA	December 2017	Although the best available information (Coull et al., 1998; Jensen et al., 2011; Ellis et al., 2012) shows extensive spawning grounds for many species, Eastern IFCA is concerned about the scale of offshore activities (particularly aggregate extraction and offshore wind farm construction) in the Southern North Sea because of cumulative effects these could have on seabed habitats. Whilst we appreciate the difficulty in studying potential wide-scale impacts, we consider the issue does warrant further consideration.	Cumulative impacts in relation to fish and shellfish species are assessed in Section 11.8. Potential cumulative impacts on seabed habitats are discussed in Chapter 10 Benthic and Intertidal Ecology
Section 33 Offshore Cumulative and Transboundary Impacts	Eastern IFCA	December 2017	Eastern IFCA maintains concerns about the potential for electromagnetic fields (EMF) from marine electricity cables affecting fish species, especially elasmobranchs (sharks, skates and rays) that are the most widespread electrosensitive fish group of UK coastal waters (CMACS, 2003). This is an increasing concern as the number of offshore energy development (and therefore marine electricity cables) increases – therefore cumulative effects of multiple developments must be considered. Currently there is uncertainty over whether EMF from cables does have an impact on receptive species. We suggest that the environmental impact assessment must present the latest understanding of this issue, and if appropriate, precautionary mitigation must be applied (e.g. use of high-permeability materials for armouring cables) to minimise impacts.	The assessment of the potential impact of electromagnetic fields (EMFs) on fish and shellfish species is based on the worst case scenario identified for the Project (Section 11.7.5.4.4 and Table 11.11Table 11.11). In the context of the assessment of EMFs it is important to note that from the results of post-consent monitoring conducted to date, there is no evidence to suggest that EMFs pose a significant threat to elasmobranchs at the site or population level, and little uncertainty remains (MMO, 2014) (see paragraph 271266). Consideration has been given in the cumulative assessment to the potential impact of EMFs associated with the Project and other developments in the wider area on sensitive receptors (Section 11.8). As described in Section 11.7.1, cables will be buried where possible to a minimum depth of 1m and protected where cable burial is not feasible.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	Natural England		Cumulative Impact Assessment: – If a phased approach is undertaken this needs to be an ever evolving process, particularly upon sensitive environmental receptors. The effect of one phase and any residual cumulative impacts will need to be strongly considered when any other potential phases are brought forward.	The Rochdale Envelope and the Project programme have been refined with the maximum duration of the construction period now being reduced to up to a maximum of 4 years and only a single phase or two phase approach proposed (Section 11.7.311.7.20). Three phase construction is no longer being considered as a design option.
Section 33 Offshore Cumulative and Transboundary Impacts	Natural England	December 2017	It needs to be made clearer whether a cumulative impact assessment regarding impacts of construction noise has already been carried out. There doesn't seem to be much discussion around any associated impacts, considering there could be up to 7 projects within 100 km that could have an effect. NE believes there is a tendency in this section to still be focused on the immediate area of the Vanguard project and not the wider cumulative effects. The more projects that are piling sequentially and concurrently are obviously increasing the area of disturbance, but also reducing the areas the fish can move into to avoid this disturbance. This needs to be reflected in table 11.21, as the cumulative impact of noise from construction will not just affect species with spawning grounds in the Norfolk Vanguard area.	Consideration has been given to all fish and shellfish ecology receptors in relation to potential cumulative impacts with other projects as a result of construction noise (Section 11.8.1.3).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	The Wildlife Trust	8th December 2017	Fishing must be included in the cumulative impact assessment. This is based on a precedent set when TWT began Judicial Review proceedings against the Department for Energy and Climate Change in August 2015 against the approval of Dogger Bank Offshore Wind Farm Order due to the exclusion of fishing from the in-combination assessment as part of the HRA. Fishing is a licensable activity and according to the Waddenzee case , the regular grant of licenses constitutes a plan or a project. Although our position remained, TWT withdrew the claim due to assurances given by the government regarding the management of fishing within Dogger Bank SAC. One of those assurances was that steps would be put in place to ensure that this scenario would not happen again and that Defra and DECC would work together to ensure fishing would be included in future offshore wind farm impact assessments. Although our challenge was in relation to the lack of inclusion of fishing as part of the HRA assessment, the same principle should apply to the EIA cumulative assessment.	Fishing activity is considered part of the existing baseline, as it has existed in the North Sea for a long time before any OWF construction, it is not a recent or an increasing activity (in most areas fishing is currently in decline). It is more appropriate for fishing to be assessed as part of a more strategic assessment rather than project / developer led assessment.
Section 33 Offshore Cumulative and Transboundary Impacts	The Wildlife Trust	8th December 2017	We are in agreement with paragraph 715 that due to uncertainty in project level CIAs, a strategic approach to assessment is required. Different approaches to assessment are taken by offshore developers using different noise criteria and thresholds and different assessment. A strategic approach would ensure consistency, produce more realistic outcomes and provide industry with more certainty on mitigation requirements.	As outlined in section 12.8.3, the level of uncertainty in completing a CIA further supports the need for a more strategic assessment rather than developer led assessment. Norfolk Vanguard Limited is supportive of these strategic initiatives, and will continue to work alongside other developers, Regulators and SNCBs in order to further understand the potential for significant cumulative impacts, and lead to reductions in impacts where appropriate.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	The Wildlife Trust	8th December 2017	A number of different CIA scenarios have been presented in tables 12.80 to 12.83 of the PEIR, with the magnitude impacts ranging from high to low. Following the discussion with the Marine Mammal Expert Topic Group, we agree that, for clarity, the most likely worst-case scenario should be presented.	As agreed the most 'likely scenario' for the potential worst-case for the CIA has been assessed in the ES chapter. The theoretical worst-case and other scenarios have been assessed in Appendix 12.6.
Section 33 Offshore Cumulative and Transboundary Impacts	Natural England	11th December 2017	Natural England appreciate it is difficult to know at this time how many UXO detonations may be required prior to commencement or UXO survey works. However, we consider it to be possible to assess a certain quantity of detonations based on experience of similar sized projects in the southern North Sea.	The CIA is based on the number of potential UXO detonations that could potential occur at the same time, not the number of UXO that could be present with each site. The assessment of the potential UXO at Norfolk Vanguard has included a strategic UXO risk management assessment (Ordtek, 2018) as outlined in section 12.7.3.1.
Section 33 Offshore Cumulative and Transboundary Impacts	Ministry of Infrastructure and Water Management Netherlands	11th December 2017	The impact on the marine mammals due to disturbance is described as the number of animals impacted by one instance of an event. This is then classified according to the criteria mentioned in the PEIR. However the consequences for the population aren't calculated. This makes it difficult to determine the cumulative effects other than qualitatively. As this is the preliminary impact assessment, we hope (and expect) that population consequences will be calculated in the next phase of the environmental impact assessment.	As outlined in section 12.8.3, population models, such as Disturbance Effects of Noise on the Harbour Porpoise Population in the North Sea (DEPONS) and the interim Population Consequences of Disturbance (iPCoD) used at a strategic level would allow consideration of the biological fitness consequences of disturbance from underwater noise, and the conclusions of a quantitative assessment to be put into a population level context. Norfolk Vanguard Limited is supportive of these strategic initiatives, and will continue to work alongside other developers, Regulators and SNCBs in order to further understand the potential for significant cumulative impacts, and lead to reductions in impacts where appropriate.
Section 33 Offshore Cumulative and	Ministry for the Environment, France	11th December 2017	It is important to note the negative effects of underwater noise from piling on marine mammals during the building phase. Indeed, other wind farms could be constructed at the same time by	The cumulative impacts of the construction of other offshore windfarms at the same time as Norfolk Vanguard has been assessed in section 12.8.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Transboundary Impacts			creating huge cumulative impacts on these marine mammals.	
Section 33 Offshore Cumulative and Transboundary Impacts	Eastern IFCA	October 2017	The East Marine Plans support sustainably-developed offshore wind energy generation projects. There are many of such projects in the southern North Sea, including Dudgeon, Sheringham Shoal, Scroby Sands, Race Bank, Triton Knoll, Lynn & Inner Dowsing, Lincs, and East Anglia offshore windfarms as well as other projects and plans. While Eastern IFCA appreciates that the cumulative impacts of Norfolk Vanguard with Norfolk Boreas and East Anglia THREE offshore wind farms have been comprehensively assessed within this PEIR, Eastern IFCA would encourage further assessment on an ongoing basis of the cumulative impacts of all Southern North Sea wind farm activity, as well as other activities including aggregate extraction activities. The impacts of these projects on the marine environment and fisheries should be assessed in-combination, highlighting any potential cumulative effects associated with the licence application and guiding decision-making and plan implementation in a stepwise approach	The assessment of cumulative impacts (Section 14.8) takes account of consented and proposed offshore wind farm projects in the former East Anglia Zone and the wider area, including both UK and non-UK projects. Operational offshore wind farm projects are considered to form part of the existing environment and therefore have not been included in the cumulative assessment. In addition to offshore wind farms a range of other projects/activities have also been given consideration for assessment of cumulative impacts, including aggregate dredging areas (Section 14.8).

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	Eastern IFCA	October 2017	Where conclusions have been drawn within the PEIR that the project could have cumulative impacts with other plans/projects, these should be mitigated for wherever possible. This includes mitigation of the cumulative impacts on offshore ornithology, marine mammals and commercial fisheries.	The cumulative effects of the project in conjunction with other projects and activities are assessed in Section 14.8. The cumulative assessment carried out did not identify significant cumulative impacts on fisheries receptors. Specific mitigation in respect of cumulative impacts, additional to those proposed in the assessment of the project alone have therefore not been proposed. Cumulative impacts on seabirds are discussed in Chapter 13 Offshore Ornithology. Cumulative impacts on marine mammals are discussed in Chapter 12 Marine Mammals.
Section 33 Offshore Cumulative and Transboundary Impacts	Natural England	October 2017	Natural England do not necessarily agree that only impacts assessed as significant resulting from the construction and operation will have the potential to contribute to cumulative effects. A range of smaller impacts over a long period of time could eventually become a significant impact.	All the potential impacts on commercial fisheries assessed for the project alone have been taken account of in the cumulative assessment (Section 14.8). Exceptions to this are safety issues and risks associated with seabed obstacles as it is understood that the same obligations will apply to other projects and therefore there is no potential pathway for a cumulative impact.
Section 33 Offshore Cumulative and Transboundary Impacts	Natural England	11th December 2017	Transboundary Impacts: We note that no transboundary impacts have been considered in the PEIR – is this because these have been screened out? If this is the case, then justification should be provided on the reasons for this.	Transboundary impacts have been considered in relation to designated sites in the Habitats Regulations Assessment.

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	Ministry of Infrastructure and Water Management Netherlands	11th December 2017	<p>Chapter 13 on offshore ornithology has a clear structure, with a good description on used methodology. Some remarks though:</p> <ul style="list-style-type: none"> • Conclusions on cumulative impacts are less clear and structured: worst case estimates of collisions/displacement are given followed by a (qualitative) reasoning that actual impacts will be lower. • Attention could also be paid to possible mitigating measures to reduce the impacts, disregard if this is a significant effect or not. <p>We also note that the impact of wind parks in the Netherlands, Belgium and Germany are not taken into consideration. For bird populations which have the Southern North Sea as habitat, an international cumulative approach would be required. Within the international cooperation of North Sea countries as a follow-up of the Political declaration on Energy Cooperation (also signed by the UK) such an approach is looked into and developed further.</p>	<p>The cumulative impact assessment sections have been revised and updated as necessary. Mitigation has been considered where appropriate. Transboundary impacts have been considered in section 13.9.</p>
Section 33 Offshore Cumulative and Transboundary Impacts	French Transboundary (Ministry for the Environment, France)	October 2017	<p>There is a clear impact on professional sea fishing, especially for Dutch and Belgium fishers. Even though, the impact on French professional fishers is very limited, we have to take into account the potential impact of the movement of foreign ships in the French fishing area. This concern is due to the rising presence of windfarm projects in the North Sea.</p>	<p>Consideration has been given to the potential impacts of the project on all fishing fleets active in areas relevant to Norfolk Vanguard, including the French fleet (Section 14.6.5). The potential impact of loss of fishing grounds and subsequent potential for displacement has been assessed for the project alone and cumulatively with other projects (Section 14.7.4.7 and Section 14.8).</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Section 33 Offshore Cumulative and Transboundary Impacts	French Transboundary (Ministry for the Environment, France)	October 2017	A public enquiry has been organised from November 6 2016 to December 16 2016 from the city of Bray-Dunes (Department du Nord) to the city of Etaples (Department du Pas-de-Calais). The purpose of this consultation was to understand and to provide an analysis of the potential impacts of the windfarm projects about: marine environment, activities in relation to sea fishing and marine navigation. Following the public consultation the commission of inquiry has considered that the environmental impact on French coasts and marine environment remain low in view of the distance between British windfarm projects and French coasts.	Noted.
Section 33 Offshore Cumulative and Transboundary Impacts	French Transboundary (Ministry for the Environment, France)	October 2017	In regard to the location of the project the potential environmental impact could be very limited due to the distance between the Norfolk Vanguard project and the French coastline. However considering the potential impact of the rising presence of windfarm projects this new project will have to take account of the cumulative impacts generated by all the activities in the affected area (potential impacts in terms of pollution produced over time by heavy metals). Specific measures will have to be taken to preserve the environmental sphere. It seems helpful to provide a global study about the environment impacts of the windfarm projects who have already been allowed. This research could help to understand the global assessment of the windfarm projects in the North Sea.	Noted. Consideration has been given in this assessment to the potential for the project to result in cumulative impacts on commercial fisheries in conjunction with other projects, both in UK and non-UK waters (Section 14.8.). The undertaking of a global study on the environmental impacts of windfarm projects already operational is outside of the scope of this ES. Where relevant, however, lessons learned and knowledge from the experience of operational projects has been taken account of in this chapter (Section 14.7).

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Section 33 Offshore Cumulative and Transboundary Impacts	Ministry of Infrastructure and Water Management Netherlands	October 2017	I am happy to note that you comply with the arrangements for East Anglia as commented by Rijkswaterstaat (distance between shipping route and wind park) with reference in Appendix 15.1 section 17.3.2 to the IMO advice.	Noted.

Feedback related to Public Consultation Process

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
Public Consultation Process	Witton and Ridlington parish Council	1 st December 2017	<p>The photographic montages of the area are completely incorrect and are not truly representative of the area and this has been pointed out to your team on numerous occasions to no avail.</p> <p>This ignoring of facts and information supplied to Vattenfall by residents is extremely obnoxious - but is typical of people's experience in dealing with Vattenfall.</p> <p>Vattenfall has made this process as anal as possible throughout with representatives at meetings unable to answer residents' questions and only keeping to the rehearsed answers.</p>	<p>Where genuine errors have been pointed out (labelling errors) these have been corrected with expedience. Local assistance in improving the quality of the material displayed has been gratefully acknowledged, and is considered by the Applicant as proof of a functioning system of engagement and consultation.</p> <p>Facts, information, views and concerns presented by residents and other consultees have been given proper consideration.</p> <p>Information has been shared in a timely manner. Development is by nature a dynamic and progressive process, meaning the project team does not have all the answers to the many questions asked by consultees, at the time they are asked. Indeed this rigorous examination of project assumptions by consultees is a fundamental aspect of the EIA process and is one which the Applicant recognises helps to ensure the development is more robust than it would be otherwise.</p>

Issue Topic	Consultee	Date	Stakeholder Comment	Regard had by the Applicant and where addressed in the ES (Doc 6.1)
				<p>The project DCO reflects the most advanced pre-application design work, which has built on and benefited from consultation. More detailed design will take place post-consent.</p>
	St Peter's Church Ridlington	17 th November 2017	<p>XXX has also sent it on to the ubiquitous 'info@norfolkvanguard.co.uk' email address, which is probably the 4th or 5th time this has been done. It is disappointing if this information and the views contained haven't so far been noticed or considered in your consultation. I think we would all be extremely grateful if you could confirm that the information contained in this email is actually being reviewed as a part of the work you are carrying out.</p>	<p>Noted. The Applicant has taken the views of St Peter's Church Ridlington into account as it has developed its proposals. The information provided by the consultee was considered directly by the project team and comments provided were fed into the development of the project.</p> <p>Concerns raised by the consultee were subsequently addressed through the decision not to progress with HVAC transmission, thus negating the requirement for CRS in the vicinity of the Church.</p>
	NFU	11 th December 2017	<p>Due to the lack of information the NFU requests that further specific one to one meetings are held for landowners, farmers and their agents to provide the information required. The NFU would also like to have a meeting direct with Vattenfall and their agents to discuss all of the issues/concerns highlighted above.</p>	<p>Noted.</p> <p>A "Land Agent Working Group" has been established, comprising representatives of the NFU as well as land agents acting on behalf of those with land interests in areas within the Project's red-line-boundary. Since the end of February up to mid May 2018, the Applicant has had 36 exchanges with this group, ranging from e-mails to face-to-face meetings.</p>

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	Eastern Inshore Fisheries Conservation Authority	11 th December 2017	Eastern IFCA is continually seeking to improve how we respond to consultations, both in terms of efficiency and meaningful content. Therefore, if any of the points raised in this response is reflected in the licence outcome, we would appreciate if you could inform us.	Noted.
	Historic England	11 th December 2017	Overall we are broadly supportive of the approach taken to the PIER. It is detailed and provides a thorough analysis of the historic environment in relation to this development. In particular there are good summaries of what has been identified to date and the approaches taken.	Noted
	CPRE	10 th December 2017	<p>2. The advantages of HVDC transmission are obscured by the misuse and interpretation of the Rochdale Envelope by progressing HVAC and HVDC together within the envelope through the overall planning process and beyond. If the company wishes to pursue both options then it should do so in a way that makes clear the differences between the two systems. It should not conflate the two within an envelope range which encompasses both systems.</p> <p>3. Not only does this not happen, but it requires some perseverance to read the code used throughout. For a range on minimum to maximum impact on a factor, the first means DC and second means AC. For a worst case scenario in assessing and impact, read AC.</p> <p>4. This approach needs to be challenged on several grounds. The consultation does not present the data in an open and clear way to those</p>	<p>Noted.</p> <p>The Applicant recognises the specialist and prescribed manner in which EIA is undertaken, and how encompassing alternatives in a project design envelope adds a further layer of complexity. The DCO process accommodates the need for expert judgement to be applied to the development process, taking into account and balancing complex environmental, physical, technical, commercial and social considerations and opportunities as well as engineering, consenting, and feasibility requirements, and the design envelope accommodates this need for some flexibility in the early design stages.</p> <p>In response to consultee interests, explanations of the role of innovation and why the Applicant seeks in particular aspects of project design to maintain optionality have been included in FAQ documents and</p>

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			<p>responding. If it is lawful in terms of the Rochdale Envelope, it is certainly not in the spirit of what the public might rightly expect. This fault is most prevalent in Chapters 5, 19 and 20; less so in 21, and clearest in Chapter 22 of those commented on in detail in this submission.</p>	<p>newsletters. A description of the Project design envelope principle, as accommodated by the DCO process is described in the Summary Consultation Document, as is the concept of “worst case scenario” in regard to the assessment of Project elements encompassed within the design envelope.</p> <p>However, the Applicant recognises that through the development process the design envelope should be reduced. The Applicant’s decision taken post Statutory Consultation to opt for an HVDC transmission system represents a significant example of design-envelope reduction.</p>
	CPRE	10 th December 2017	<p>Finally, in this summary, as noted above, that at least within the Vattenfall documentation there is some information which is sufficient to try and understand the issues surrounding the HVAC vs HVDC situation. We add also that the CPRE members visiting the roadshows for the PEIR found the staff most helpful and open to discussion. This greatly adds to the consultation process. The print Consultation Summary Document is well written and illustrated, and a help in leading into much documentation, and linking across the specialist chapters.</p>	Noted.
	Necton Parish Council	8 th December 2017	<p>We make the following points regarding the consultation process:</p> <p>1.1. Four footprint options were first unveiled to identified Necton residents at an event on 19 July 2017. Detailed photo-imagery from viewpoints was available for only footprint option 1 and 4. The PEIR identifies</p>	<p>The materials presented at the July workshops, drop-in exhibition and subsequently on the Applicant’s website (see Chapter 14 of the Consultation Report) explain the similarities between footprint options 1 and 2 and 3 and 4 respectively, and sought to take participants through a consideration of the constraints and opportunities highlighted through the EIA process that would influence site selection.</p>

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			footprint 2 as the selected option, but there appears to be little evidence to explain this option over the other options.	The site selection chapter summarises the key features which ultimately influenced the identification of “footprint 2” as an appropriate project substation location, and other chapters, support this decision making.
	Necton Parish Council	8 th December 2017	1.2. The National Grid extension was never adequately identified at any of the public consultation events and the full extent of the extension only came to light within the PEIR. National Grid has a statutory duty to consult and engage and it is our view that duty has not been adequately carried out. This point was raised with Vattenfall management team by this Council on a number of occasions as far back as 24 March 2017.	The Applicant has worked with NGET to ensure that appropriate plans and models were available during the Statutory Consultation. At the drop-in events an engineer from NGET was in attendance to be able to respond to local questions and hear local concerns and ideas.
	Necton Parish Council	8 th December 2017	1.3. This Council has received many complaints from residents specifically about the quality of consultation and their perception is that their contributions have not being considered.	<p>The Applicant is grateful to all those who have engaged with the project and responded to consultations. Many ideas, concerns and opinions expressed by consultees have directly influenced the appraisal of alternatives for the project. Examples of where the Applicant has responded to requests from Necton residents include:</p> <ul style="list-style-type: none"> - moving Project substations away from the village of Necton and utilising existing screening to maximum effect in order to reduce landscape and visual impacts. - Developing visual tools to help residents consider what the project substations would look like. - Taking into account concerns and learning from recent experiences during the construction phase of the Dudgeon and National Grid

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				<p>substation, reflected in the outline Code of Construction Practice and other draft documents accompanying the DCO.</p> <p>The Applicant understood that residents expressed lower levels of confidence in the EIA process than in other areas along the onshore cable corridor and therefore it has made additional efforts to involve Necton residents in the considerations which have influenced the EIA process, including the July 2017 workshop and drop-in event. Team members and the Local Liaison Officer have visited individual properties in Necton at the invitation of residents to hear their concerns, and potential solutions discussed.</p>
	Necton Parish Council	8 th December 2017	1.4. Members of this Council, who attended the specially convened consultation event of 19 July at Green Britain Centre, reported that the delivery of the event was unprofessional and chaotic. The programmed schedule was changed, removing the opportunity for questions, there was little acknowledgement of disability needs (poor visuals and no provision for those with hearing difficulties) and the sensitivities of concerned residents was not given due regard.	A professional facilitator managed the meeting. It was felt that small group discussions were a more effective means of allowing more people to have their say, to hear discussions and to have their questions answered, rather than a whole group discussion or panel type Q and A session – which discourages participation in favour of just a few people.
	Necton Parish Council	8 th December 2017	1.5. It is understood that there are residents living in neighbouring hamlet of West End that have not been engaged by Vattenfall in the consultation process. This hamlet lies approximately 1 KM to the south-east of the proposed Vanguard substation.	Noted. We have attempted to be as inclusive as possible and have worked with local representatives and groups, to encourage them to help us, by word of mouth and other means to ensure all who have an interest can be involved in the process.

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	Necton Parish Council	8 th December 2017	1.6.Vattenfall has acknowledged a number of errors on various consultation documents, which has increased confusion and concerns during the period they committed to engaging with communities.	Noted. Following any identified labelling errors, the Applicant corrected materials and updated versions were made available on the project website and on hard copies available at consultation events.
	North Norfolk District Council (NNDC)	8 th December 2017	<p>7.2 The District Council recognises the logistical complexity involved in a project of this scale in terms of evidence gathering, public consultation and response and engagement with those who have a legitimate interest in the project. However, it is critically important, both as a matter of fairness and to ensure proper decision making, that the following principles are adhered to:</p> <p>i. Vattenfall, and all consultees including in particular potentially affected communities as well as the wider public must have accurate, comprehensive, relevant, understandable and up-to-date information. Without that information, rational and evidence-based decisions cannot be made, rendering the project liable to challenge;</p> <p>ii. It is crucial that Vattenfall address the issues raised by consultees in a timely, comprehensive, rational and evidence based manner so that consultees have a clear understanding of the advantages and disadvantages of any proposal. This is also important to help dispel any confusion or uncertainty about what the project is likely to entail and to help minimise fear in the local</p>	<p>Noted.</p> <p>The interim consultation report “Hearing Your Views III” was welcomed by representatives of NNDC at a meeting on 22nd February 2018, in Norfolk.</p> <p>The Applicant remains in contact with NNDC, and has met to discuss additional communications measures.</p> <p>The Applicant has been happy to consider any appropriate and proportionate means of communication that allow the views of consultees and communities to feed into the development.</p>

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			<p>community about the impact that significant infrastructure projects such as this can bring;</p> <p>iii. In the event that there is disagreement as to a particular approach or direction, it will be essential that any subsequent decision is securely based on publicly available evidence taking into account public law principles of decision making.</p> <p>iv. Consultation must be, and must be seen to be, genuine. Consultees, including affected local communities, have a right to be heard. They also have the right to have their concerns or issues genuinely considered and to receive adequate and reasonable responses to any concerns advanced. That process may take some time but sufficient time must be allowed if the rights of consultees are not to be adversely affected. Where issues raised cannot reasonably be addressed, it will be for Vattenfall to explain clearly the reasons why not and also provide adequate reasons to support any decision taken.</p> <p>7.3 In order to help Vattenfall act consistently with the above suggested principles, the District Council:</p> <ol style="list-style-type: none"> 1) Invites Vattenfall to establish protocols for the dissemination of information and protocols for addressing issues and providing evidence based reasoning in response, to be agreed with the District Council on behalf of its residents; 	

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			<p>2) To ensure the agreed protocols can be adhered to, Vattenfall need to ensure adequate resources at appropriate levels of skill and professional expertise; and</p> <p>3) If Vattenfall wish to establish a staff presence at the Council Offices to help meet the above obligations, then the District Council will seek to assist with that request.</p>	
	NSAG	28 th November 2017	<p>The Consultation and Response Timetable has been too tight to properly assess such a massive project, and the volumes of data and information –beyond the resources of most authorities and public bodies, let alone ordinary folk. For instance for many, their only opportunity to read the PEIR was at a drop-in session on November 10th 2017. This 31 chapter document left most people hopelessly floundering, and to expect the large computer-less percentage of this farming community to read it at one sitting was totally unreasonable. A hard copy could be ordered for around £1000. This again was beyond the means of most. We asked that all households in Necton should be sent this documentation and additional time be provided for us to read it and make reasoned comments. But Vattenfall refused.</p>	<p>The SoCC, developed in accordance with advice from, and finalised with due regard to comments from local planning authorities, described how consultees could access the PEIR and other consultation documents, including the Summary Consultation Report. The S48 notices also highlighted where and when hard copies of the PEIR could be viewed, and USB sticks with all relevant documentation on them were available for free at local information points and on request from info@norfolkvanguard.com</p>

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	NSAG	28 th November 2017	<p>The details provided in the PEIR and Non-technical Summary do not describe the Proposal as clearly and simply as possible. There are no proper accurate and detailed photo montages/ wireframe images to enable a ready visualisation/ appreciation of their visual impact.</p>	<p>The Applicant provided numerous documents and materials to aid understanding during the statutory consultation period. Whilst the PEIR document is very detailed, the Non-Technical Summary of the PEIR, as well as the Consultation Summary Document produced presented this information in a more accessible format to aid understanding.</p> <p>Photomontages were provided, as well a 3D interactive model, which was made available at all public events as advertised in the SOCC. These visual aids were designed to further assist in enabling understanding of the proposed infrastructure options.</p>
	NSAG	28 th November 2017	<p>During the consultation to date, including the recent presentation on the 10th November photomontages of the views from local viewpoints were presented, and screen simulations of the views from peoples' home at a height of 1.5 metres.</p> <p>The photomontages were inaccurate and sometimes recently labelled incorrectly, and in Vattenfall's own words in writing on 26th October 2017, were 'not appropriately scaled' and 'not particularly clear'.</p> <p>At the drop-in presentation photomontages were displayed, both with and without mitigation.</p> <p>The mitigation shown after 15 years was so inadequate that it was impossible to see the difference between the two photomontages.</p>	<p>Noted</p> <p>Noted. The error referred to was not in a Statutory Consultation document – but in a newsletter, which in part aimed to encourage participation. The errors were corrected quickly, with an additional local letter drop around Necton.</p> <p>Noted.</p> <p>As noted in the February 2018 Newsletter, mitigation planting around the substation will be enhanced, building on expert and local suggestions in response to</p>

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				<p>consultation. Where possible layered planting schemes and mixed native-trees of different height will be deployed for natural -looking screening.</p> <p>The Applicant recognises that mitigation planting may not present an effective short-term solution to landscape and visual impact mitigation, and therefore embedded mitigation through design and sensitive siting is the best way to reduce local impacts. The site selection chapter of the ES describes the site selection process and the LVIA chapter provides the latest photomontages which provide representations of the Project substation from various local viewpoints, agreed through the EPP with statutory consultees and regional stakeholders.</p>
	NSAG	28 th November 2017	<p>On the screen people were shown simulations with a great deal of hedging missing. The man operating the device said this was because he was unable to judge the height of it. Not a good basis for showing people all the facts. The simulations were shown at 1.5 metres and, with the lack of realistic hedging, did not help them understand what might be seen from upstairs in their homes. As a result people still have no clear idea what they will see of the substations. This project should not be given permission until things are made very much clearer.</p>	<p>Noted.</p> <p>The digital model was developed largely using high quality aerial photography., with local ground truthing. Not all hedge heights would have been measured and therefore rather than estimating the screening capacity of hedges (and running the risk of over-estimating this mitigation) they would not have been included in the model. This is in accordance with the EIA 's precautionary approach.</p>

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	NSAG	28 th November 2017	<p>We object to this project because Vattenfall have not carried out sufficient consultation with residents. There is reference throughout this document to the fact that Vattenfall alternately say how far the nearest receptor is and then say it hasn't been determined. This must be rectified. It is bad practice to have not found out about the closest receptor by this point.</p> <p>Also, the consultation is not complete because the residents of West End have had no communication from Vattenfall and have received no newsletters and yet partially fall within the 1km envelope of the project. They have a direct view because of the lay of the land. West End resident, XXXX, has confirmed that no residents were contacted or made aware of the development. He, along with the other residents in the West End area will be affected by noise, light and view pollution as well as flooding issues.</p>	<p>Consultee's view noted.</p> <p>The Applicant has carried out informal consultation as well as statutory consultation in accordance with relevant requirements as evidenced within this CR.</p> <p>All households that fall within the Primary Consultation Zone (described in the SOCC, Section 8.1) have been consulted. The Applicant notes however that it is difficult to guarantee receipt of all information in large newsletter mailings and residents may not receive the information for numerous reasons (the letter is considered spam and thrown away, the address is inaccessible, human or postal error are just a few possible reasons). Therefore, in order to ensure that one method of information provision was not relied upon, numerous other means of notifying local residents have also been deployed. All newsletters were made available on the project website upon publication, newspaper adverts providing details of the consultation were placed, batches of newsletters and presentations were offered and provided to Parish/Town Councils, route notices were distributed, and Facebook adverts were deployed.</p> <p>As noted in the February 2018 Newsletter and elsewhere, most of the electrical assets comprising the</p>

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				<p>onshore project substation for an HVDC transmission system are enclosed within a building (converter hall). Electrical assets outside the converter hall can be covered by tight-fitting noise enclosures. These measures provide significant noise mitigation.</p>
	NSAG	28 th November 2017	<p>“National Grid consults with local interest groups and residents whenever we are planning works that will have a high impact on a residential area or a site valued for its amenity. This also helps us to identify key environmental issues which can be taken into account and more effectively mitigated. In order for consultation to be most effective it is done at a stage where the results can be used to influence the design of a project. When undertaking works which will have a less significant impact, we liaise with and inform affected residents according to the severity of that impact. We will take into account local biodiversity action plans and other local initiatives being undertaken by local communities. Under the provisions of the Planning Act 2008 we have a duty to consult and engage with communities and stakeholders. We have decided to integrate our amenity duties and our community and stakeholder engagement duties into one document which covers how we will meet these duties.”</p> <p>Necton has had no such engagement from the National Grid regarding their considerable part of the project –i.e. their extensions to provide</p>	<p>Noted. Preliminary Environmental Information on the Project, including the proposed works to the National Grid substation at Necton and the overhead line, was made available to inform consultation as part of the Statutory Consultation undertaken for the Project.</p> <p>The Applicant has sought to provide information in a timely manner to local communities. Each stage of informal consultation provided information and detail that was available at that point in the process and sought feedback on that information.</p> <p>Preliminary Environmental Information on the Project, including the proposed works to the National Grid substation at Necton and the overhead line, was made available to inform consultation as part of the Statutory Consultation undertaken for the Project.</p> <p>The Applicant has worked with NGET to ensure that appropriate plans and models were available during the Statutory Consultation. At the drop-in events an engineer from NGET was in attendance to be able to respond to local questions and hear local concerns and ideas.</p>

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			<p>connection points. Indeed Vattenfall only notified Necton of the National Grid Extensions in the last two weeks previous to the meeting on 10th November 2017. Before this they had refused to give any information.</p>	
	NSAG	28 th November 2017	<p>All personnel at the first presentation, introduced themselves as being from Vattenfall. Members of the public understood this to mean they were on Vattenfall's staff and held positions of knowledge and authority within the company. It wasn't until a few months later it became clear, not by them telling us but by our own investigation, that several of the people presented as 'Vattenfall' were actually employed by a marketing company, called Remarkable. As a consequence Vattenfall were able to allow the marketing people to feed us incorrect information, which we naturally trusted, and which led us to make false assumptions and develop a false sense of confidence in the project, which later worked very much against us.</p>	<p>Noted.</p> <p>The Applicant trust team members, whether Vattenfall employees or employees of third parties contracted to undertake specific tasks, to be acting in good faith, and to answer questions to the best of their ability.</p> <p>However, noting the preference expressed by consultees at Necton to understand the make-up of the team, team member badges were introduced indicating their roles and direct employer.</p>
	NSAG	28 th November 2017	<p>The residents of Necton believe they have been cleverly manipulated and misled with deliberate misrepresentation. Examples of this are: At the first representation one member of 'Vattenfall', which we now believe have been XXXX from Remarkable, told many people that they did not need to be concerned about Boreas, as it would only be a small add-on. Here are some testimonies to this: XXXXX, Ramm's Lane, Necton: "I do not remember who I</p>	<p>The Applicant strongly denies any deliberate misrepresentation of information through the pre-application process.</p> <p>Care has been taken to ensure that all information provided at public events, on the project website, or on written published materials has been consistent and accurate with the information available at that point in the development of the project proposals. Copies of</p>

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			<p>spoke to at the first meeting in Necton but when I asked why there were going to be two, I was definitely advised that Boreas would not be as large as Vanguard and would be an add on of around 6.5 acres." XXXX, St Andrew's Lane, Necton: "I spoke to a couple of Vattenfall people who expressed their concerns 'sympathising' with me re: the treatment we had endured with Dudgeon and I was assured that Vattenfall had certainly learnt from this Company's mistakes! I wasn't told how big they visualised Vanguard but was told that Boreas would just be like a small extension added on." XXXX: St Andrews Lane, Necton: "I was told that because of the Vanguard substation, Boreas would only need to be a small add on. A year later, they quite rudely implied that I had mis-heard but I am certain this is what I was told." XXXX, St Andrews Lane, Necton: "I was told that we should not 'worry' about Boreas as it would only be a small add-on of around 6 acres. This was told to me by XXXX at the first Vattenfall presentation in Necton in October 2016. We found out months later that Boreas was in fact going to be the same size as Vanguard."</p>	<p>consultation materials set out the nature of the proposed Onshore Project Substations, and explained how they would differ depending on the transmission technology utilised (HVDC or HVAC).</p> <p>Information has been available throughout the non-statutory and statutory consultation periods explaining the relationship between Norfolk Boreas and Norfolk Vanguard. While through the development process, including consultation, this relationship has evolved to ensure the maximum possible embedded mitigation is encompassed within the strategic design of both projects.</p>
	NSAG	28 th November 2017	<p>At the same initial meeting many people were told that Necton was the only option that had been offered to Vattenfall for connection and that they had not been able to choose Norwich Main as Dong (soon to be changed to Orsted) had got there first.' In fact the NG have confirmed that Vattenfall were offered 3 connection points, as they were the first to apply. These connections</p>	<p>Noted.</p> <p>The connection point to the National Grid Electricity Transmission system is a strategic decision, made prior to the EIA process.</p> <p>Vattenfall received and accepted a Grid Connection Offer for Norfolk Vanguard before Orsted (formerly</p>

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			<p>were Walpole, Necton and Norwich Main. Vattenfall/Remarkable also claimed that it was not possible for the National Grid to move the project elsewhere. Whereas in fact, when we suggested an alternative site, the National Grid said it was feasible. These misrepresentations may seem trivial but by them using these and many others that added up, the consensus of opinion is that Vattenfall gradually steered and manipulated the population rather than informing it as fully as possible.</p>	<p>DONG) received and accepted their offer for Hornsea Project Three.</p> <p>The assessment undertaken for Norfolk Vanguard concluded that Necton was the most co-ordinated, efficient and economical option considered.</p> <p>Site selection and consideration of alternatives for the Project onshore substation is dealt with in chapter 4 of the ES.</p>
	NSAG	28 th November 2017	<p>It is recommended in such consultations as Vattenfall have just undertaken, that 'local knowledge' is made use of. In the first few months following the first presentation Vattenfall contacted XXXXX using XXXX (Remarkable, who introduced himself as 'from Vattenfall'), to ask her to put together a 'panel' of local people who could advise on the suitability or otherwise of site options. XXXXX spent the next several weeks talking to local people and identifying those with long-standing local knowledge. The idea of this 'panel' was cultivated by XXXXXX for two months and then dropped by Vattenfall. Had this panel been used then the current site would not have been selected. XXXXX feels that XXXXXX was just keeping her busy because she had been identified as a leader in the protest against them, and that there was never going to be a panel.</p>	<p>The Applicant notes this comment, however refutes this account of the process.</p> <p>The Applicant considered the use of a local panel to discuss the proposals at certain key points along the cable route corridor – such as at Necton. However, following further discussion, the decision was taken to include an additional phase of non-statutory consultation instead (Phase IIb – Workshops), focused on the areas around the two key infrastructure locations (CRS and Onshore Project Substation). This provided an opportunity to consult directly with relevant local consultees and residents at a point at which enough information was available, allowing for more informed and detailed discussion of the key issues.</p>

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	NSAG	28 th November 2017	<p>XXXXX then explained to XXXXX how Vattenfall (or his own company) would achieve what they wanted at Necton. He said they would have already selected their exact preferred site right at the beginning, but they would first say it could be anywhere within 3 km of the connection pylon, in order to try and divide the community. They would then hint at a site that would be so horrendous to villagers that when they offered another slightly better one, it would be accepted. He said they would gradually isolate a small part of the community near the substation site and offer incentives to the rest in order that they would accept the isolated community as a worthwhile sacrifice. Vattenfall of course deny this, but they have 'coincidentally' followed that path very closely, ending up at the small off-shoot of the village known as Ivy Todd. However, this has not been accepted as we have a strong community spirit here. In any case, the scale of the project means it does not fit in anywhere near a rural village. When XXXXX was told by XXXX to stop calling her and email instead, as she wanted what he had said in writing, he disappeared completely off the scene. It was said that he had to have surgery, but that was almost a year ago – at the meeting in July 2017 XXXX asked a group of Vattenfall's people where he was. They all looked back and forth at each other and then one announced that he was on holiday. We apologise for including this matter as it may appear trivial, but it goes to show why we feel we have been misled.</p>	<p>The Applicant notes this comment, however refutes this account of the process. The Applicant maintains that consultation has been undertaken in a transparent way as part of a structured process, as evidenced within this Consultation Report.</p>

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	NSAG	28 th November 2017	<p>We were told that the workshop in July 2017 was to discuss the 4 footprints in the selected area and would be interactive, as by definition all workshops are. The invited audience were scheduled (according to the agenda sent round) to discuss what they'd been shown after every part of the presentation. (Initially no ordinary residents from the most affected part of the village were included in the invitations. The Necton Substations Action Group protested this and were eventually given extra invitations for a few of the residents there.)</p>	<p>This comment relates to the non-statutory consultation Phase IIb workshops. The Applicant issued invitations to key community groups in the locality and invited further relevant nominations of people that it was felt should participate in the event.</p> <p>In addition, and due to the requirement for workshop numbers to be managed to ensure a productive discussion, drop in events were convened the following day for each workshop location. These drop-in events were intended to provide all those who were not able to attend the workshop with an opportunity to view the latest information and discuss this with the project team, who were also in attendance.</p>
	NSAG	28 th November 2017	<p>The discussion items were removed from the agenda, without the previous knowledge of the participants. No discussion was allowed at any time. The participants were shushed in a very unprofessional way by Vattenfall personnel present, and told to write questions and concerns on post it notes, which were to be stuck onto a badly hand-written sheet of paper –one for each footprint. This note session took place some half hour after the footprints had been shown on an inadequately sized screen. Bearing in mind that 99% of people present had not been taken to the site, and had never set foot on it (it being on private land) it was ridiculous in the extreme to expect them to make valid comments on the footprints. Later Vattenfall selected footprint 2, without giving any reason relating to the consultation to do so.</p>	<p>The Applicant notes the consultee's view. The Applicant maintains that the substation siting decision was taken following extensive surveys, discussions with relevant technical consultees, as well as with the local community.</p> <p>The non-statutory consultation Phase IIb workshops formed part of the consultation with the local community and information received at these events was fed into the decision-making process.</p> <p>Site selection and consideration of alternatives for the Project onshore substation is dealt with in chapter 4 of the ES.</p>

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	NSAG	28 th November 2017	NOTE: The 3-D virtual model showing what the project might look like is to date still not available online as promised in the SOCC document.	<p>For technical reasons the 3D model could not be accessed for general viewing and use by the public.</p> <p>The 3D interactive model covers an area of approximately 75x75km (5,625km²). It contains over 122,000,000 triangles and 1,109 individual textures. The size and complexity of the model means it needs a minimum of 6.5GB of graphics memory to run it. The PC required to run such a model is a dedicated graphics or gaming machine. The Applicant was advised that the average home PC or laptop does not have the capacity to run such a model. Furthermore, while the model aims to be easy to use and navigate, it does require some computing dexterity. For these reasons, the model was not uploaded to the project website. The 3D model was also available at public events throughout the consultation process.</p>
	Oulton Parish Council	December 2017	3. With the possibility of combined projects running alongside each other and local roads being closed while cabling is installed, will there be consultation between companies to minimise impact on local communities having lengthy detours?	The Applicant recognises the importance of ensuring a considered approach to construction and will be working closely with other operators to ensure that construction is carefully and properly managed. The Applicant has prepared an outline Code of Construction Practice together with outline access and traffic management plans to minimise impacts. Further consultation with relevant consultees will inform the process.

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	N2RS		<p>Many people were not aware of the footprint and visual impact of the CRS's –not least because this information was excluded from the first three project newsletters (October 2016, March and June 2017). People feel disenfranchised and angry that key decisions have been made without ensuring the community was in full possession of the facts. The process has not met the standard we would expect of a major organisation and the decisions made to date do not accurately reflect the growing concerns of the communities most affected.</p>	<p>Care has been taken to ensure that all information provided at public events, on the project website, or on written published materials has been consistent and accurate with the information available at that point in the development of the project proposals.</p> <p>Following Statutory Consultation, the decision to adopt HVDC transmission technology responds fully to the concerns expressed by N2RS.</p>
	N2RS		<p>We have recorded a number of errors (eg incorrect captioning of photomontages/CGI images and inaccuracies on maps) but there has been significant criticism of the photomontages used to visualise the CRS's and their impact on the landscape. The PEIR admits that such photomontages are not necessarily representative of what the human eye sees. This is borne out by our own experience; they present a 'zoomed out' view compared to that of the naked eye. Current screening is not as substantial as suggested, the structures do not appear to be in scale when compared to local landmarks and new planting appears to suggest a completely unrealistic growth rate in this area.</p>	<p>Noted. The Applicant has swiftly rectified any captioning errors in discussion with consultees and made relevant corrections available as soon as possible on the project website.</p> <p>The Applicant has worked with the Landscape and Visual Impact specialists to develop the most "natural looking" visualisations possible. New forms of photomontages are incorporated within the LVIA chapter.</p> <p>Following Statutory Consultation, the decision to adopt HVDC transmission technology responds fully to the concerns expressed by N2RS.</p>