The Planning Act 2008

East Anglia One North (EA1N) and East Anglia Two (EA2) Offshore Wind Farms

Planning Inspectorate Reference: EA1N – EN010077 & EA2 – EN010078

Deadline 8 – 25 March 2021

East Suffolk Council's Response to Additional Information Submitted by the Applicants at Deadline 7

Review of Additional Information Submitted by the Applicants at Deadline 7

1. Introduction

1.1. East Suffolk Council (ESC) has noted that the following additional information has been provided by the Applicants at Deadline 7 which is of relevance to the Council's responsibilities:

- EA1N and EA2 Location Plan (Onshore) Rev 3 – REP7-002
- EA1N and EA2 Land Plans (Onshore) Rev 04 - REP7-004
- EA1N and EA2 Work Plans (Onshore) Rev 5 – REP7-005
- EA1N and EA2 Draft Development Consent Orders V5 – REP7-006
- EA1N and EA2 Schedule of Changes to the Draft Development Consent Orders V4 – REP7-008
- EA1N and EA2 Explanatory Memorandum V2 – REP7-010
- EA1N and EA2 Book of Reference V6 – REP7-021
- EA1N and EA2 Environmental Statement Appendix 6.2 – Onshore Plans Secured by the Development Consent Order V4 – REP7-023
- EA1N and EA2 Outline Code of Construction Practice – REP7-025
- EA1N and EA2 Applicants' Comments on Responses to EXQ2
- EA1N and EA2 Expert Report on Noise – REP7-041
- EA1N and EA2 Deadline 7 Project Update Note – REP7-042
- EA1N and EA2 Applicants' Comments on East Suffolk Council's Deadline 6 Submissions – REP7-057
- EA1N and EA2 Figure 29.37 – Viewpoint 5 Public Rights of Way, near Moor Farm (with National Grid GIS Substation) – REP7-062

1.2. ESC has also provided comments in relation to a submission the Applicants made at Deadline 6 where the Applicants responses related to matters of noise.

- Applicants' Comments on ESC's Deadline 5 Submissions - REP6-026

1.3. ESC has reviewed the above documents and provided comments where relevant in the table on page 3. The comments provided relate to both East Anglia One North (EA1N) and East Anglia Two (EA2) projects.

1.4. The comments contained within this document are from ESC. The Council continues to work closely with SCC on these projects but to avoid repetition, each Council will lead on specific topic areas as set out in the Councils joint Local Impact Report.

The table below details ESC's comments in relation to additional information submitted by the Applicants at Deadline 7.

Document submitted at Deadline 6 & 7			East Suffolk Council's Comments
Applicants' Comments on ESC's D5 Submissions (REP6-026)			
2.1 Deadline 4 Project Update Note (REP4-026)			
ID 2. The Applicants strongly believe that the representative background noise level established for the substation locations is underpinned by extensive baseline noise measurement data and robust, repeatable statistical analysis. Further information regarding this matter has been provided in response to ESC's comments on the *Noise Modelling Clarification Note* (REP4-043) within *section 2.4*			The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.
2.4 Noise Modelling Clarification note (REP4-043)			
ID 1. The Applicants note that evidence of background noise levels established by ESC have not been submitted to the Examination.			This information was submitted by ESC at Deadline 5 (REP5-048).
ID 4. The Applicants anticipate that the finished ground surface of the onshore substations will be finished with stone chippings. The Applicants are aware of			ESC maintains that tamped ground of the type typically found on substation sites would not normally be expected provide the level ground absorption assumed within the Applicants' revised model. However, the new proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design and requiring formal approval from ESC means that this difference of opinion no longer affects

the guidance within ISO 9613-2:1996 but note that the anticipated surface of the area surrounding the substations comprises neither of paving, water, ice, concrete or other low porosity substrate. The Applicants reviewed available literature including Architectural Acoustics Illustrated (Ermann, 2015) and consider that a ground attenuation coefficient of 0.5 more appropriately represents the porosity level of the ground surface within the onshore substation footprint			ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.
ID 5. As stated within the Noise Modelling Clarification Note submitted at Deadline 4 (REP4-043), the design of the National Grid substation does not include reactive or winding plant (which noise emissions are associated with). Within the REP4-043, the Applicants have further considered the possible noise sources of the National Grid substation, including AIS circuit breakers, emergency generator use and overhead transmission lines. Based upon information provided by National Grid			ESC welcomes the inclusion of the National Grid Substation into the cumulative operational limits set out in Requirement 27 of the draft DCOs.

these items of plant were screened out of further modelling on the following basis: • The predicted noise contribution at noise monitoring locations from the operation of the overhead transmission lines were lower than the existing measured background noise level at each monitoring location; • The use of emergency generators does not form part of the day-to-day operation of the National Grid substation and the received noise levels at the three nearest noise monitoring locations with the generator operating were no greater than the modelled noise levels without the generator operating; and • AIS circuit breakers are considered to be activated infrequently, only in the case of an emergency and the predicted noise contribution at noise monitoring locations from the operation of circuit breakers were lower than the prevailing			

measured background noise levels.			
ID 10. The Applicants note that the introduction of a new noise source is dependent on the noise climate. However, the Applicants included these nationally significant infrastructure projects as examples to demonstrate the efforts taken to commit to maximum operational noise rating levels several orders of logarithmic magnitude below that of similar projects. The results of the updated modelling demonstrate that the predicted operational phase noise levels from the Projects (either singularly or cumulatively) are below the revised maximum operational noise rating limits (32dBA at SSR2 and SSR5 NEW, and 31dBA at SSR3) and are below those assessed for other projects of a similar scale. The Applicants therefore consider that the noise levels anticipated to be emitted (which result in, at worst, minor adverse impacts) are acceptable for this location and mitigation has been applied appropriately.			ESC maintains that the context in this case is one of a new industrial noise source being introduced to an otherwise exclusively rural sound climate. This is a different situation to the projects identified by the Applicants, which all consist of onshore substations being introduced in areas with existing industrial or urban noise sources present (e.g. National Grid substations). ESC maintains that the guidance in BS8233:2014 and the Guidelines for Community Noise (WHO, 1999) set limits for internal noise levels which apply only to broadband noise from anonymous sources (e.g. continuous traffic noise) and not to the impact of new industrial sources in quiet rural locations. For noise from industrial sources BS8233:2014 states in Section 6.5.2: "*Where industrial noise affects residential or mixed residential areas, the methods for rating the noise in BS4142 should be applied. BS4142 describes methods for determining, at the outside of a building:* *a) noise levels from factories, industrial premises or fixed installations of an industrial nature in commercial premises and;* *b) background noise level."* ESC and the Applicants have previously agreed that BS4142 is the appropriate methodology for assessing the impact of operational noise, a methodology based on external noise levels. This is because internal noise levels are dependent on the sound insulation performance of building envelopes in turn is entirely dependent on the construction and ventilation paths of individual buildings. An assessment of indoor noise levels in the receptors would require detailed noise break-in calculations to individual receptor properties and even then, would be subject to very significant uncertainties due to the behaviour of low frequency sound in

Table 4 of BS8233:2014 and the Guidelines for Community Noise (WHO, 1999) state that a night-time noise level of 30dB inside a bedroom is 'desirable'. The Applicants note that the revised maximum operational noise rating levels specified within the *Noise Modelling Clarification Note* submitted at Deadline 4 (REP4- 043) and within the *draft DCO* (REP5-003), apply a maximum operational noise rating level in a free field location adjacent to the specified noise sensitive receptors (i.e. outside). Given that a building envelope provides a degree of noise attenuation from external noise sources, the Applicants consider that, even with partially opened windows, the internal noise levels received from the operation of the substations will be substantially lower than the desirable night-time noise level set by BS8233:2014 and WHO (1999).			rooms, which cannot be easily modelled. Consideration of internal noise levels also excludes any assessment of the impact of noise in gardens and other outdoor spaces.
ID 13. The Applicants would note the long-term duration of the baseline noise monitoring survey and the fact that the meteorological conditions experienced			The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

during the survey period were conducive to collecting high quality data. Due to this, the Applicants are confident their representative background noise level is based upon a robust and extensive dataset. Regardless of whether the specific source of a noise measurement reflected within the baseline noise measurement dataset has been identified, without proof that this source would cease to exist in the future the Applicants maintain that such noise is an intrinsic characteristic of the exiting noise climate.			
ID 14. The Applicants note that the predicted noise levels for the cumulative operation of the Projects' onshore substations in parallel with the National Grid substation are no greater than 3dB above the as measured background noise levels (see REP4-043). As per *Table 25.19* of the ES (APP-073), the Planning Practice Guidance (PPG) / Noise Policy Statement for England (NPSE) category for a Lowest Observed Adverse Effect Level (LOAEL) is			The appropriate figures for LOAEL are not agreed between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8. ESC did not omit data from the analysis of background noise levels detailed in Appendix 4 of the Joint Local Impact Report (REP1-132) and note that the Applicants' own expert reviewer confirmed (REP7-041) that the analysis presented by ESC was appropriate, albeit different to that presented by the Applicants. The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

an increase of 3-5dB above background (LA90). As such, the Applicants note that the maximum operational noise rating levels specified within the *draft DCO* (REP5-003) fall within the LOAEL category, based upon the background noise levels established through analysis of the baseline noise monitoring data. The Applicants do not accept the approach taken by ESC to omit data in their analysis on the basis that its source cannot be identified. When recorded over a long-term survey period, recurring and observable patterns within the baseline noise measurement dataset are an inherent characteristic of the existing noise climate whether identifiable or not. It is considered that, given received noise levels decrease with increasing propagation distances, the current maximum operational noise rating limits set within the *draft DCO* (REP5-003) for a free field location adjacent to SSR2 and SSR5 NEW are sufficient to limit noise to no greater than 32dBA at the locations			

closest to the footprints of the Projects' onshore substations. The Applicants do not accept ESC's assertion of the baseline noise levels for each monitoring location specified in the absence of a sufficient robust survey being undertaken. The Applicants maintain that the assessment of operational noise presented within the *Noise Modelling Clarification Note* (REP4-043), which supersedes that presented within *Chapter 25* of the ES (APP- 073), is robust and accurate given that the representative background noise level has been established from repeatable statistical analysis on a wealth of measured baseline noise data		
2.5 Applicants' Comments on Council's Deadline 3 Submission (REP4-025)		
ID 1 The Applicants note that, as per *Chapter 25* of the ES (APP-073), '*a 3dBA change in environmental noise level is accepted to be the lowest perceptible level*'. An increase of >3dB is considered to be the lowest observed adverse effect level (LOAEL), which corresponds with the threshold of the onset of a minor adverse		The principle of a noise exposure hierarchy is set out in the National Planning Practice Guidelines (NPPG). However, NPPG does not set fixed criteria for LOAEL level and other thresholds and instead states "*The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation*." The LOAEL threshold of 40 dB Lnight, outside referred to in the WHO Night Noise Guidelines for Europe relates solely to public health effects. It is not intended as a tool to assess the environmental impact of new noise sources. The appropriate methodology for this is *BS*

impact as per *Table 25.19, Chapter 25* of the ES (APP-073). For wider context and as referenced within the *Applicants' Comments on East Suffolk Council's Deadline 4 Submissions* (REP5-010), the Night Noise Guidelines for Europe (WHO, 2009) state: '*There is no sufficient evidence that biological effects observed at the level below 40 dB Lnight,outside are harmful to health.....40 dB Lnight,outside is equivalent to the lowest observed adverse effect level (LOAEL) for night noise*'.			*4142:2014+A1:2019 "Methods for rating and assessing industrial and commercial sound"* which the Applicants have identified in the ES as the appropriate methodology tool for determining the LOAEL thresholds and setting operational noise levels accordingly. The appropriate figures for LOAEL are not agreed between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.
ID 3 Regarding the dominance of the harmonic filter noise contributions to each of the noise monitoring locations, the Applicants refer to their response at ID15 of *Section 2.4* above. The Applicants note that 1/3 Octave Band data is required for a thorough assessment of audible tones in sounds according to Annex C of BS4142:2014+A1:2019, which will only be available during the detailed design stage. Irrespective of whether tonality or other such acoustic corrections are identified or not, as per the wording of Requirement 26 and			ESC maintains that the magnetostriction effects inherently associated with the proposed equipment mean that the operational noise limits should be subject to a +6 dB feature correction for tonality unless there is 1/3 Octave tonality analysis to confirm otherwise. This remains an area of disagreement between the Applicants and ESC. However, the new proposal to include a pre-commencement Operational Noise Control Plan which includes an assessment based on the detailed substation design and requires formal approval from ESC means that this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

Requirement 27 of the *draft DCO* (REP5-003), the Applicants must ensure that the operation of the onshore substations does not exceed the maximum operational noise rating limits at the specified receptors (i.e. the maximum operational noise rating limit is inclusive of any acoustic corrections such as tonal elements).The Applicants contest ESC's reference to 'hum' and note that the Operational Noise Assessment for East Anglia ONE did not conclude tonality arising from the operation of this substation (see REP5-022).			
Applicants' Comments on East Suffolk Council's Deadline 6 Submissions (REP7-057)			
2.1 Responses to Examining Authority's Commentary on draft DCOs (REP6-080)			
ID1			ESC welcomes the Applicants commitment to provide an Onshore Preparation Works Management Plan secured by requirement 26 of the draft DCOs.
ID2 and ID12			ESC notes and welcomes the introduction of Schedule 17 into the draft DCOs.
ID8			The amendments to the wording of Article 17 are welcomed.
ID9			ESC refers to the response provided by the Council in relation to the Examining Authority's ISH15 hearing action points submitted at Deadline 8.
ID13			In the interests of clarity ESC considers that Article 37(2) should be revised to explicitly include the relevant planning authority and the highway authority as excluded from the application of Article 37(1), alongside the Secretary of State and Marine Management Organisation. Although the general excluding words in Article 37(1) are noted, there is no reason to

			expressly exclude the Secretary of State's jurisdiction and not the relevant planning authority's, for example.
ID14 and ID41			ESC maintains concerns regarding the deemed consent provision provided in Schedule 16 and does not consider this is necessary or justified. The provision is not contained within Appendix 1 of The Planning Inspectorate's Advice Note 15: Drafting Development Consent Orders. More comprehensive comments have been provided within the Council's ISH15 Oral Summary of Case submitted at Deadline 8. ESC however notes and welcomes the amendment to the time periods for discharge, the request for information and in relation to appeals the period for making written representations and counter submissions.
ID17			ESC welcomes the revisions to this requirement to secure monitoring and remedial works if the monitoring identifies a risk of exposure of the infrastructure as a result of the rate and extent of erosion at the landfall site. Outline details of the monitoring has been provided in Appendix 2 of the Outline Landfall Construction Method Statement (OLCMS – REP6-022).
ID19			ESC has engaged with the Applicants since the publication of this response and welcomes the Applicants commitment that Wok No.29 will be subject to a ten year replacement planting period and look forward to reviewing this amendment within the updated draft DCOs and Outline Landscape and Ecological Management Strategy (OLEMS).
ID21			The Council notes and is satisfied with the Applicants' explanation in relation to referencing pre-construction surveys in Requirement 21(2). We have no further comment to make on this point.
ID24			ESC welcomes the inclusion on the National Grid Substation into the operational noise limits set out in Requirement 27 of the draft DCOs. ESC comments on the Applicants Expert Report on Noise submitted at Deadline 7 (REP7-041) are set out separately in this document.
ID25			ESC notes and welcomes this update to Requirement 30 of the draft DCOs.

ID26		ESC notes and welcomes this update to Requirement 37 of the draft DCOs.
2.2 Operational Noise Comments Deadline 6 (REP6-081)		
The Applicants note that ESC welcomes the reduction in the maximum operational noise rating levels specified within Requirements 26 and 27 of the updated *draft DCO* (REP5-003). There remains a matter of disagreement between the Applicants and ESC regarding the background noise levels at the onshore substation locations, and the maximum operational noise rating levels not being agreed. The Applicants refer to *section 4* of the *Expert Report on Noise* submitted at Deadline 7 (document reference ExA.AS-5.D7.V1) written by an Environmental Health/1/3 (EH/1/3) committee member with a key role in the development of the BS4142 guidance. The Applicants note ESC provided its analysis of the Applicants' baseline noise data within Appendix 4 of the *Joint Local Impact Report* (REP1-132). As admitted within their Deadline 5 submission (REP5-048), ESC chose to ignore certain data in the dataset within its analysis of		ESC comments on the Applicants Expert Report on Noise submitted at Deadline 7 (REP7-041) are set out separately in this document. ESC did not omit data from the analysis of background noise levels detailed in Appendix 4 of the Joint Local Impact Report (REP1-132) and note that the Applicants' own expert reviewer confirmed (REP7-041) that the analysis presented by ESC was appropriate, albeit different to that presented by the Applicants. The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

the background noise levels. The Applicants do not accept ESC's approach of 'ignoring' data to arrive at the background noise levels they suggest. Regarding potential future development at the site, it will be the duty of future developers (if any) to undertake a cumulative impact assessment for noise with the Projects and National Grid infrastructure. The operation of future developments at the site must comply with current guidance and legislation at that time.			
ID 2. The Applicants note ESC provided its analysis of the Applicants' baseline noise data within Appendix 4 of the Joint Local Impact Report (REP1-132). As admitted within their Deadline 5 submission (REP5-048), ESC chose to ignore certain data in the dataset within its analysis of the background noise levels. The Applicants do not accept ESC's approach of 'ignoring' data to arrive at the background noise levels they suggest.			ESC did not omit data from the analysis of background noise levels detailed in Appendix 4 of the Joint Local Impact Report (REP1-132) and note that the Applicants' own expert reviewer confirmed (REP7-041) that the analysis presented by ESC was appropriate, albeit different to that presented by the Applicants. The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8. Information regarding the site visit undertake by ESC was submitted at Deadline 5.

The Applicants maintain that their baseline noise survey was undertaken over a long-term monitoring period, under consistently favourable meteorological conditions conducive to noise monitoring. As a result, the Applicants consider that the survey data collected are high quality and reflective of the existing noise climate experienced at the onshore substation locations. The Applicants note that ESC have not provided evidence of their site visit undertaken to inform their opinion that background noise levels are lower than those presented by the Applicants.			
ID 3. The Applicants note ESC provided its analysis of the Applicants' baseline noise data within Appendix 4 of the *Joint Local Impact Report* (REP1-132). As admitted within their Deadline 5 submission (REP5-048), ESC chose to ignore certain data in the dataset within its analysis of the background noise levels. The Applicants do not accept ESC's approach of 'ignoring' data to arrive at the background noise levels they suggest.			ESC did not omit data from the analysis of background noise levels detailed in Appendix 4 of the Joint Local Impact Report (REP1-132) and note that the Applicants' own expert reviewer confirmed (REP7-041) that the analysis presented by ESC was appropriate, albeit different to that presented by the Applicants. The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

IDs 4 and 5. The Applicants refer to section 4.2 of the Expert Report on Noise submitted at Deadline 7 (document reference ExA.AS-5.D7.V1), written by an EH/1/3 committee member with a key role in development of the BS4142 guidance. The Applicants do not agree with ESC's interpretation of the guidance and consider the interpretation of Lowest Observed Adverse Effect Level (LOAEL) at +5dB above background is consistent with current guidance and is a level adopted by other NSIPs in their assessment of operational noise. The definition for LOAEL as presented within Chapter 25 of the ES (APP-073) is 'the level above which adverse effects on health and quality of life can be detected'. Whilst this approach of defining the LOAEL was adopted for the Thanet Extension offshore wind farm, other similar projects have used the same approach taken by the Applicants with			ESC comments on the Applicants Expert Report on Noise submitted at Deadline 7 (REP7-041) are set out separately in this document. ESC notes that the proposed onshore substation sites for Hornsea Project Two, Hornsea Project Three and all other examples for similar DCOs provided by the Applicants are for sites adjoining existing National Grid substations and therefore a different the context to this development which is that of new industrial noise source being introduced to an exclusively rural noise climate. The appropriate figures for LOAEL are not agreed between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

regard to using a 5dB noise increase as the LOAEL, including Hornsea Project TWO and Hornsea Project THREE The Applicants therefore do not agree with ESC's interpretation of the guidance and consider the interpretation of LOAEL at +5dB above background is consistent with current guidance and standard industry practice.			
ID 6. The Applicants note that the operational noise limits referred to by ESC within their comment are the same as the background noise levels they suggest at ID3 of this table. The Applicants do not agree with ESC's view that the maximum operational noise rating limits should be set at or below background. This approach is not supported by either local policy or industry guidance. The Applicants consider that setting maximum operational noise rating limits at the LOAEL is appropriate and in line with current guidance, as supported by the Expert Report on Noise submitted at			The operational limits proposed by ESC were set in relation to background sound levels in accordance with the methodology adopted by Applicants in the ES (albeit based on a different definition of LOAEL in relation to the background noise level, as this relationship is not agreed between ESC and the Applicants). The appropriate figures for LOAEL and representative background sound levels are therefore not agreed between ESC and the Applicants. However, this difference of opinion does affect the final position which is set out in ESC's Response to Hearing Action Points ISH12 submitted at Deadline 8. ESC comments on the Applicants Expert Report on Noise submitted at Deadline 7 (REP7-041) are set out separately in this document.

Deadline 7 (document reference ExA.AS-5.D7.V1). With regard to the derivation of background noise levels, the Applicants note ESC provided its analysis of the Applicants' baseline noise data within Appendix 4 of the Joint Local Impact Report (REP1-132). As admitted within their Deadline 5 submission (REP5-048), ESC chose to ignore certain data in the dataset within its analysis of the background noise levels. The Applicants do not accept ESC's approach of 'ignoring' data to arrive at the background noise levels they suggest. The Applicants do not share or accept ESC's interpretation of BS4142:2014 +A1:2019 regarding how to establish representative background noise levels and refer to the Expert Report on Noise submitted at Deadline 7 (document reference ExA.AS-5.D7.V1) written by an EH/1/3 committee member with a key role in development of the BS4142 guidance.			

ID 7. As supported by the *Expert Report on Noise* submitted at Deadline 7 (document reference ExA.AS-5.D7.V1), the Applicants maintain that the methodology adopted for the assessment of operation phase noise is in line with the current available BS4142 guidance. Having undertaken early engagement with the supply chain, the Applicants are confident that the maximum operational noise rating levels specified within the *draft DCO* (an updated version has been submitted at Deadline 7, document reference 3.1) are achievable and will design the scheme to comply with such requirements			ESC comments on the Applicants Expert Report on Noise submitted at Deadline 7 (REP7-041) are set out separately in this document.
IDs 8 and 9. The Applicants note that this statement is included within the *East Anglia ONE Operational Noise Assessment* (REP5-022) to provide context of the 'typical' noise emissions from certain components of a substation. However, the assessment goes on to identify that '*no tones are objectively quantifiable*'			ESC comments on the East Anglia One Operational Noise Assessment (REP5-022) in relation to this scheme are set out in submissions at Deadline 6 (REP6-081). ESC maintains that the magnetostriction effects inherently associated with the proposed equipment mean that the operational noise limits should be subject to a +6 dB feature correction for tonality unless there is 1/3 Octave tonality analysis to confirm otherwise. This remains an area of disagreement between the Applicants and ESC. However, the new proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design means that this difference of opinion no

(paragraph 68), demonstrating that tonality can in effect be designed out during detailed design. The Applicants will continue to give consideration to noise matters, including the tonal characteristics of any such noise emissions, during the detail design of the onshore substations. However, the Applicants reiterate that, irrespective of any tonal character corrections, the overall operational noise rating levels (including any tonal corrections) must comply with the maximum operational noise rating levels specified within the *draft DCO* (an updated version has been submitted at Deadline 7, document reference 3.1). As such, concerns raised in relation to tonality are inconsequential as this element will be controlled by virtue of Requirement 27 of the DCO. The Applicants refer to the *Expert Report on Noise* submitted at Deadline 7 (document reference ExA.AS-5.D7.V1), written by an Environmental Health/1/3 (EH/1/3) committee member with a key			longer affects the final position which is set out in ESC's Response to Hearing Action Points ISH12 submitted at Deadline 8. ESC comments on the Applicants' Expert Report on Noise submitted at Deadline 7 (REP7-041) are set out separately in this document.

role in development of the BS4142 guidance.			
ID 10. The Applicants clarify that the offer made during Issue Specific Hearing (ISH) 4 was to provide the operational noise monitoring report for East Anglia ONE only. The sound intensity measurements referred to by ESC are in relation to the operation phase noise monitoring undertaken at East Anglia ONE. Appendix A of the *East Anglia ONE Onshore Substation Operational Noise Assessment* (REP5-022) provides the 1/3 Octave Band Measurements at each noise sensitive receptor location.			The East Anglia One Operational Noise Assessment (REP5-022) does not include 1/3 Octave data for noise levels at or close to the site boundary or on the substation site, as would be required to assess the tonality of the equipment at source. ESC maintains that the magnetostriction effects inherently associated with the proposed equipment mean that the operational noise limits should be subject to a +6 dB feature correction for tonality unless there is 1/3 Octave tonality analysis to confirm otherwise. This remains an area of disagreement between the Applicants and ESC. However, the new proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design means that this difference of opinion no longer affects the final position which is set out in ESC's Response to Hearing Action Points ISH12 submitted at Deadline 8.
ID 11. The Applicants note that the wording of Requirement 27 has been amended within the updated *draft DCO* submitted at Deadline 7 (document reference 3.1) with reference to tonal noise character penalties. The Applicants reiterate again that the maximum operational noise rating levels specified within the DCO Requirements are inclusive of any tonal correction and the detailed design of the			ESC does not agree with the Applicants' response. However, the new proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design means that this difference of opinion no longer affects the final position which is set out in ESC's Response to Hearing Action Points ISH12 submitted at Deadline 8.

onshore substations will be undertaken to comply with these limits. As such, the Applicants consider ESC's comment to be a moot point.			
ID 15. As noted within the *Applicants' Response to Appendix 4 of the Local Impact Report* (REP3-071), a further review of the dataset of baseline noise measurements taken at SSR3 was undertaken. The data shows a bi-modal distribution of the baseline noise levels at SSR3, with the full night-time measurement data ranging between 18dB(A) to 39dB(A). Whilst the Applicants agree that one of the peaks appears around 24dB, whilst another significant peak appears around 30dB(A). As a result of this bi-modal distribution it is inappropriate to use the modal value suggested by ESC. For consistency the same statistical analysis methodology used for SSR3 was employed at other monitoring locations (i.e. using the arithmetic average value between the two modal peaks). The Applicants note that the measured baseline noise levels at SSR3 included levels below the measurement ranges of			ESC notes that the Applicants' own expert reviewer confirmed that analysis presented by ESC was appropriate (REP7-041), albeit different to that presented by the Applicants. The subject of representative background sound levels therefore remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

the sound level meters (SLMs). The measurement range of each of the SLMs in accordance with IEC 61672 is stated in the manufacturer's specification are as follows: • Rion NL-52 SLM: between 25dB(A) and 138dB(A); and • B&K 2250 SLM: between 24.8dB(A) and 139.7dB(A). The manufacturers specification for both SLMs also refers to 'inherent noise', which is understood to relate to the electronic noise generated by the SLM itself. Taking into consideration the 'inherent noise level' stated within the manufacturers specifications, baseline noise measurements made between 18dB(A) and 24dB(A) are still acceptable but should be used with caution as an increasing error margin in those measurements would occur as noise levels reduce towards 17dB(A). The cumulative sampling of the noise levels at SSR3 indicates that up to 41% of the measured data is below the level that the Council's Consultant would term as the 'noise floor' of the SLM. This adds further weight to the use of 26.1dB LAf90,5mins			

as the most appropriate background noise descriptor at this location. It is considered that removing values below the noise floor of each SLM within the analysis would result in artificially increasing the overall background noise level above that already determined for the onshore substation locations. By including these outliers, the Applicants consider that a more representative background noise level for each monitoring location has been established.			
ID 19. The Applicants are not aware of any guidance relating to corrections for noise measurements below the noise floor of noise measurement equipment. By excluding values below the noise floor, the Applicants would have omitted 41% of the baseline noise measurement data collected at SSR3, resulting in an artificially increased baseline noise level at this receptor location. By including these values, the Applicants have presented the most representative baseline noise levels for SSR3 based upon the measurement data collected.			ESC did not omit data from the analysis of background noise levels detailed in Appendix 4 of the Joint Local Impact Report (REP1-132) and note that the Applicants' own expert reviewer confirmed (REP7-041) that the analysis presented by ESC was appropriate, albeit different to that presented by the Applicants. The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

ID 20. The Applicants note that the overall operational noise rating levels (including any tones) must comply with the maximum operational noise rating levels specified within the *draft DCO* (an updated version has been submitted at Deadline 7, document reference 3.1). As such, concerns raised in relation to tonality are inconsequential as this element will be controlled by virtue of DCO Requirement 27. Site boundary measurements were not undertaken during the on-substation survey for the reasons described within the *East Anglia ONE Operational Noise Assessment Report* (REP5-022); observations were undertaken during the off-substation survey following the measurement at Bullenhall Farm at the nearest point of the public bridleway to the East Anglia ONE substation (approximately 110m from the East Anglia ONE substation boundary). No audible tonal noise emissions were observed at this location.		ESC does not agree with the Applicants' response. ESC notes that the results of measurements taken at Bullenhall Hall Farm and on the East Anglia One substation site are not presented in 1/3 Octave Bands as would be required for tonality test to be conducted on the source levels. However, the new proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design and requiring formal approval from ESC means that this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

ID 21. The Applicants note that ESC has undertaken its own analysis of the Applicants baseline noise dataset as presented within Appendix 4 of the *Joint Local Impact Report* (REP1-132). The Applicants understand that, during their site visit undertaken to qualitatively assess night-time noise levels in the area, ESC's surveyor spent a total of 2 hours at site on one occasion between the hours of 11pm and 1am in November 2019. It is also understood that that only four measurement locations were attended during ESC's site visit, with one location of a single 15-minute measurement and three positions of a single 5-minute measurement each. It is the Applicants view that an attended noise survey of such short duration should not be compared with the extensive baseline noise data collected by the Applicants, which was undertaken over a much longer-timeframe under consistently favourable meteorological conditions and recorded baseline noise levels over a recurring 24-hour period for		ESC maintains that purpose of this visit was to investigate the sound climate around Friston and attempt to establish any factors which may explain why the noise environment described by the Applicants was at odds with the Council officer's and consultant's combined significant experience conducting and reviewing noise assessments in this type of rural setting. ESC does not and has not claimed that this exercise is intended to replace the unattended noise monitoring conducted by the Applicants. The subject of representative background sound levels therefore remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

the duration of the survey in line with the methodology agreed with the Expert Topic Group (ETG). A single measurement at each location (as understood to have been undertaken by ESC's surveyor) is wholly inadequate in providing a representative experience of the existing noise climate of the onshore substation locations.			
ID 22. The Applicants have reviewed the statistical analysis undertaken that was presented within *Chapter 25* of the ES (APP-073) and note a mistake in the reporting of the baseline noise at SSR3, which was corrected within the *Applicants' Response to Appendix 4 of the Local Impact Report* (REP3- 071) and subsequently within the *Noise Modelling Clarification Note* submitted at Deadline 4 (REP4-043). The correction was made following a review of the baseline noise data at all monitoring locations, soon after representations were received from ESC. The review identified that all other monitoring locations have been correctly analysed, and the Applicants do not			Noted. The subject of representative background sound levels remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

agree with ESC's interpretation of the baseline noise data. The Applicants refer to their comment at ID15 regarding the baseline noise level at SSR3.			
ID 26. ESC's assertion that 1/3 Octave Band data is not presented within the *East Anglia ONE Onshore Substation Operational Noise Assessment* (REP5-022) is not correct. Appendix A of the report tabulates the 1/3 Octave Band measurements. This is considered sufficient to enable an assessment of tonality at the receiving location in line with Annex C of BS4142:2014 +A1:2019. The Applicants clarify that the offer made during ISH4 was to provide the operational noise monitoring report for East Anglia ONE only and note that the absence of tonal characters can be confirmed without the need for sound intensity measurements. Acknowledging the differences between the East Anglia ONE substation and the			ESC notes that the results of measurements taken at Bullenhall Hall farm and on the East Anglia One substation site are not presented in 1/3 Octave Bands as would be required for tonality test to be conducted on the source levels. However, the new proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design and requiring formal approval from ESC means that this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8. ESC maintains that the differences in relative source and receiver positions and sound climate between Friston and the Bramford EA1 site mean that the East Anglia One operational substation monitoring does not show that noise the proposed EA1N and EA2 sites will not be tonal at the receivers in Friston. ESC maintains that the magnetostriction effects inherently associated with the proposed equipment mean that the operational noise limits should be subject to a +6 dB feature correction for tonality unless there is 1/3 Octave tonality analysis to confirm otherwise. This remains an area of disagreement between the Applicants and ESC. However, as stated above the new commitment to provide a pre-commencement Operation Noise Control Plan requiring formal approval from ESC means that this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.

onshore substations for the Projects, the Applicants note that the findings of the East Anglia ONE operational substation monitoring demonstrate that onshore substations can be designed such that tonal characteristics within operational noise emissions are mitigated.		
ESC Comments on Outline Watercourse Crossing Method Statement (REP3-048)		
ID2.		Whilst ESC welcomes the further reduction in the Hundred River crossing width for each project (to 34m per project), as set out in our previous responses (including most recently our Deadline 7 response (REP7-063)) the Council considers that it remains unclear why a doubled crossing width is required for two projects when a reduced width for both projects has been achieved in other sensitive locations. The Applicants' explanation for the need for this greater width provided at ISH14 (day 2) is noted. The commitment made at ISH14 to including reference within the Outline Watercourse Crossing Method Statement (OWCMS REP6-041) for the need for the habitat loss within the crossing area to be minimised as part of the detailed project design is welcomed.
Applicants' Comments on ESC's Deadline 2 Submissions (REP5-010) - Ecological Enhancement Clarification Note (REP1-035)		
ID5.		As a point of clarification, the Council have never requested that a detailed ecological enhancement strategy should be developed prior to the detailed design of the project. Detailed design should include ecological enhancement details as an integral part of it. Whilst ESC acknowledges that there are potentially opportunities for ecological enhancements within the projects, it is considered that the principle of this needs to be demonstrated to meet the requirements of National Policy.

			As above, the Council notes that the Applicants now intend to provide updated calculations in relation to ecological enhancement at Deadline 8. We therefore have no further comment on this at this time.
Deadline 7 Project Update Note (REP7-042)			
Section 1.2 Reduction of Order Limits at Work No.6 (Landfall)			ESC welcomes the removal of plot 3 from the Order Limits and notes the updating of the Land Plans (onshore). Work Plans (onshore), Location Plan (onshore) and Book of Reference to reflect this change.
Section 1.3 Hundred River Crossing			Whilst the Council welcomes the further reduction in the Hundred River crossing width for each project (to 34m per project), as set out in our previous responses (including most recently our Deadline 7 response [REP7-063]) ESC considers that it remains unclear why a doubled crossing width is required for two projects when a reduced width for both projects has been achieved in other sensitive locations. The Applicants' explanation for the need for this greater width provided at ISH14 (day 2) is noted. The commitment made at ISH14 to including reference within the OWCMS (REP6-041) for the need for the habitat loss within the crossing area to be minimised as part of the detailed project design is welcomed.
Section 1.4 National Grid Substation Noise Condition			ESC welcomes the commitment to include the additional noise monitoring location to the north of the National Grid substation at SSR3 and the inclusion of the National Grid substation within the requirement. ESC has no objections to the removal of Requirement 26 given the Applicants confirmation that the onshore substations can only ever operate when the National Grid substation is operational
Expert Report on Noise (REP7-041)			

4.1 Application and interpretation of policy			It is not correct to say that ESC's position is that "any adverse impacts should be prevented or avoided without any regard to costs or other factors". ESC acknowledges the policy requirements set out in paragraph 2.24 of Noise Policy Statement for England (NPSE) which states that "…all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur." Overarching National Policy Statement for Energy (EN-1) also contains similar wording in paragraph 5.11.9. Until very recently, the Applicants' position has been that the operational noise limits have been set at a level to avoid adverse impacts. However, ESC does not agree with the LOAEL thresholds proposed by the Applicants to set these operation limits and therefore suggested that lower operational noise limits should be set to avoid adverse impacts. ESC considers that the LOAEL should be set at background sound level. The appropriate figures for LOAEL and representative background sound levels are not agreed between ESC and the Applicants and these points are discussed in the following sections.
4.2 Application and interpretation of BS4142			The key phrase in the wording of Section 11 of BS4142:2014+A1:2019 reproduced in the Applicants' report is "depending on context". In this case, the context is one of a new industrial noise source being introduced to an otherwise exclusively rural noise climate. ESC maintains that the lowest observed affects are likely to occur with a rating level equal to the background sound level, as opposed to 5 dB above as stated by the Applicants. This is a matter of interpretation and it is not correct to say the policy or standards clearly direct towards a single definition of LOAEL over the other. For example, ESC considers the context in this situation to be different to a situation where a new industrial noise is introduced to a sound climate with contributions from other existing similar sources (e.g a new onshore substation

			next to an existing National Grid substation site) where a higher LOAEL threshold might be more appropriate. The Applicants' report discusses the note in Section 11 of BS4142:2014+A1:2019 regarding situations where background sound levels and rating levels are low. ESC raised the issue of assessing the impact where both background sound levels and rating levels are low with the Applicants during consultation in November 2019 and received the following response: "*BS4142:1997 advised that the standard did not apply where background levels were below 30dBA; at the time the standard was developed and published the capability and accuracy of sound level meters was unable to cope with such low background levels. Sound level meter technology has improved considerably since that time and the latest version of BS4142 acknowledges this by removing the guidance relating to low background levels. The reviewer's comment implies that the previous guidance regarding low background levels should continue to apply, regardless of technological improvements, a position with which we fundamentally disagree, and which is not in accordance with current industry best practice.*" Notwithstanding the Applicants' previous position on this matter, ESC agree that the standard clearly directs that "Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background". However, ESC strongly disagrees with the report's author that there is no technical basis for ever setting an operational noise limits below 35 dB LAr. The previous version of BS4142 advised that background sound levels could be considered to be low at 30 dB LAF90 and rating levels at around 35 dB LAr rating levels. However, these thresholds were removed from the standard to allow a wider degree of interpretation depending on context. In this case, ESC considers the context of a new industrial source being introduced to an existing rural environment, and the precedent that sets for the assessment

			of noise from future connections in the area, provides robust reasoning for the adoption of a lower operational noise limit than would apply elsewhere. Had the Applicants adopted this alternative position earlier in the Examination period, or ideally before submitting the final Environmental Statement, ESC would have had the opportunity to conduct a review of the available research literature and legal precedent in order to attempt to agree an appropriate threshold with the Applicants. However, with so little of the of examination period remaining this has not been possible, and this therefore remains a matter of disagreement between the Applicants and ESC. This difference of opinion however no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.
4.3 Representative background sound levels			In reference to the analysis of the Applicants' noise survey data presented by ESC in Appendix 4 of the Local Impact Report (REP1-132) the report's author states *"There is nothing wrong with their analysis and there is nothing to suggest from BS4142 that their analysis is invalid or inappropriate"* but goes on to suggest some reasons for using alternative statistical analysis techniques (REP7-041). ESC maintains that the statistical analysis presented in Appendix 4 of the Local Impact Report (REP1-132) provides more representative figures for typical background sound levels. However, ESC do agree with the report's author that at low noise levels there is point where the outcome of the assessment becomes less reliant on the precise background sound level and more reliant on the absolute rating level of the noise source. However, as discussed in the comments on Section 4.2 of the same report, ESC maintains that the specific threshold is dependent on context and the specific position presented in the report is not agreed by ESC. The author goes on to discuss the effect of noise from transmission lines or other unidentified sources on the noise climate in the area. ESC agrees that it is not necessary to remove or

			exclude intermittent noise sources from the survey data where these form part of the typical sound climate. However, ESC maintains that the Applicants could reasonably be expected to attempt to identify the dominant noise sources in order to determine whether the sample period captured a variation in sound levels which is representative of typical conditions in the onshore substation study area. The subject of representative background noise levels therefore remains unresolved between ESC and the Applicants. However, this difference of opinion no longer affects ESC's final position which is set out in the Response to Hearing Action Points ISH12 submitted at Deadline 8.
4.4 Uncertainty			The report's author implies that a variation in operational noise levels by up to 3 dB over the operational limits imposed by the DCO requirement should be seen as acceptable by the Examining Authority. This is in stark contrast to ESC's understanding of the legal responsibilities placed on the Applicants to strictly meet any operational noise limits defined in a DCO requirement. ESC maintains the Applicants should consider calculation uncertainty when assessing the impact of their predicted noise ratings. However, the recent proposal to include a pre-commencement Operational Noise Control Plan including an assessment based on the detailed substation design and requiring formal approval provides ESC with sufficient comfort that any concerns associated with calculation uncertainties can be adequately considered at detailed design stage.
6 Construction noise			Section 6 correctly identifies that the Control of Pollution Act 1974 (COPA) contains provisions for the control of construction noise. Contractors have a legal duty under COPA to use Best Practicable Means (BPM) to minimise construction noise and vibration. Developers often use the provisions of Section 61 of COPA to obtain consent prior to starting works. ESC agree that this is a proactive approach and generally regarded as best practice for Nationally Significant Infrastructure Projects.

			The report also notes that practical guidance can be found in BS 5228-1:2014 on the steps that can be taken to manage construction noise. ESC agrees that BS 5228 provides appropriate guidance on BPM construction noise mitigation.
Outline Code of Construction Practice (REP7-025)			
Section 10.1.6 Measures Specific to Non Road Mobile Machinery			This document should include undertakings to minimise the potential impact of emissions to air from Non Road Mobile Machinery (NRMM) on nearby designated habitat sites. This should include an undertaking for NRMM to be located away from designated habitat sites wherever possible, in order to prevent further damage being caused to these sites to that already identified in the Deadline 6 Onshore Ecology Clarification Note (REP6-025). It should include requirements for minimum standards for NRMM, and appropriate monitoring to confirm that the impacts on air quality at designated sites do not exceed those forecasted. The Outline Code of Construction Practice (OCoCP) includes an undertaking for NRMM to comply with the requirements of EU Directive 2016/1628. While this is welcomed, it needs to be clarified, as this directive applies mainly to the manufacture, approval, import and distribution of NRMM, and not to its use at a construction site. Is it intended that all NRMM used at the site will conform with the Stage V emission limits set out in Annex II of Directive 2016/1628? This diverges from comments made in the Applicants' "Submission of Oral Case for Issue Specific Hearing 7," (REP6-052) which makes the case for not adopting Stage V emission limits. It is ESC's understanding that the Applicants will commit to using NRMM with minimum Stage IV emission limits, but this does not yet seem to be clearly identified in any documentation. In summary, ESC considers that clarification of the Applicants' proposals for use of NRMM is required.

			The HGV emission requirements are welcome in the OCoCP. The Council requests that requirements align with those in the Outline Construction Traffic Management Plan (OCTMP) following aforementioned amendments regarding monitoring, route choice and confirmation of 70% limit identified above. ESC welcomes the commitment to a comprehensive set of dust control measures for locations where potential dust impacts are greater and looks forward to confirming these through discussion around the Code of Construction Practice.
9 Noise and Vibration Management 9.1 Control Measures			Paragraph 92 states that the main objective with regard to managing construction noise will be to minimise noise and vibration impacts to acceptable levels in accordance with BS 5228:2009+A1:2014 (or the most recent iteration). ESC considers this is correct; likewise, the placement at the start of Section 9 of this commitment would underpin the entire construction noise and vibration control strategy.
			Paragraph 94 states that, prior to commencement of onshore works, the Applicants intend to apply for consent under Section 61 of COPA, including details of the works and proposed noise mitigation measures. ESC agrees that this is a proactive approach and also broadly that this is considered industry best practice.
			Paragraph 95 states that the Construction Phase Noise and Vibration Management Plan (CPNVMP) will be submitted for approval and form part of the final CoCP. ESC welcomes the response to our previously raised concerns in the updated OCoCP (REP7-026) which confirms that the CPNVMP will consider property sensitivity in the area.
			Paragraph 96 identifies other British Standards and Acts which will be adhered to and which will be considered in the development of the final CoCP. This includes BS 4142:2014, the Environmental Protection Act 1990 and the Noise and Statutory Nuisance Act 1993. ESC considers this an appropriate and proportional approach.
			Paragraph 97 sets out typical best practicable noise mitigation measures to be implemented and controlled through the CPNVMP. These measures appear to be derived from the applicable guidance in BS 5228-1 and represent an appropriate starting point for BPM

			construction noise mitigation. ESC considers that other measures might be required and expect this to be considered in the final CoCP.
			In paragraph 99, the Applicants have made amendments to address specific concerns raised by ESC. This is welcomed. Specific noise mitigation proposals are provided for landfall construction, the onshore cable route, and onshore substation construction respectively and these seem to be proportionate and relatively well considered in relation to specific works phases. The additional commitment to consider additional practicable measures in relation to works areas and residential receptors is also welcomed. ESC expects these measures to be developed further and confirmed in the final CPNVMP within the final COCP.