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 4 – 13 January 2021

Comments of Suffolk County Council as Lead Local Flood Authority

1. Comments on the Applicant's revised draft Development Consent Order.

1.1 Schedule 1, Part 3, Requirement 41 – This should also reference the Work No 38 (sealing end compounds) and Work No 34 (permanent access road) served by the operational drainage management plan.

1.2 SCC questions whether Work No 33 needs to be reworded as this mainly relates to landscaping works, as part of OLEMS, but still references drainage.

2. Comments on any revised/updated Statement of Common Ground (if any)

2.1 Not applicable.

3. Comments on any additional information/submissions received by Deadline 3.

Onshore Substations Update Clarification Note, Document Reference: REP3-057, Date: 15th December 2020

Paragraph No	SPR statement	SCC Comment
15	The substations will be further from the existing surface water flood extent to the south and west (see Figure 2 in Appendix 1).	This is only true for the EA1N & EA2 substations. The National Grid substation will still interact with an existing surface water flow path. No details have been provided on how this will be managed.

Outline Landscape and Ecological Management Strategy, Document Reference: REP3-030, Date: 15th December 2020

Paragraph No	SPR statement	SCC Comment
45 & 136	The northern SuDS basin has been moved eastwards towards the National Grid substation (Figure 3), allowing additional space for further woodland planting between the access road and this SuDS basin as described in section 3.5.12	This should be noted due to the impacts it has on future space restrictions for any extension to the National Grid substation. It should also be noted that the plan area of the attenuation/infiltration basins is yet to be agreed and thus, the plan area of these features may increase. This will result in even less space to the west of the proposed National Grid substation for future expansion. 
134	The outline design of the onshore substation drainage has been designed in accordance with best practice as referenced in the SuDS Manual (CIRIA 2015). This includes maximising amenity and biodiversity benefits, whilst delivering the key objectives of managing flood risk and water quality	As per comments in response to the Outline Operational Drainage Management Plan, the proposals do not manage surface water flood risk as required by national and local policy and do not comply with best practice.
135	The outline design of the onshore substation drainage has inherent benefit to reducing downstream flood risk in the village of Friston. For the onshore substations and National Grid infrastructure, the storage afforded by the SuDS basins will be designed to accommodate runoff from a 1 in 100 year storm event plus a 20% additional allowance for climate change. These measures will limit the runoff to the equivalent of the pre-existing greenfield (undeveloped) runoff rate. The English standard is to design for a 1 in 100-year (+20% for climate change) storm event.	Disagree that 20% Climate Change is suitable, as per previous SCC representations. There is no commitment to remove impermeable areas by 2069 (the upper end of the 20% epoch). Instead, 40% should be used as a conservative approach. Regardless, neither of the proposed SuDS basins are designed to manage either the 1:100 + 20% or + 40% event, as explained in SCC's response to the Outline Operational Drainage Management Plan and specifically, Appendix A (SuDS

		Design Summary Assumptions) of that document, which is provided as part of this submission.
137	Current outline design has not allowed for any infiltration in the base of the SuDS basins. Following consent, detailed design will likely allow for some percolation through the base of the SuDS basins which would help reduce the required storage volume and enable greater reductions in flood risk downstream.	If infiltration is achievable and viable then this must be solely relied upon, as per previous SCC representations. If infiltration is not achievable or viable, then no infiltration rate can be utilised as part of the design process to ensure a conservative design approach based siltation of the base of the attenuation structure.
139	The Applicant has committed to providing additional 'surface water management SuDS basin' capacity (currently identified as concept within Figure 5) to reduce flood risk for the village of Friston, in addition to the SuDS strategy currently proposed. Confirmation of the size, volume and location of this additional 'surface water management SuDS basin' capacity will follow detailed design of the onshore substation and National Grid substation; following establishment of a catchment hydraulic model and final project parameters.	Whilst the intention of this (to reduce existing surface water flood risk to Friston) is supported, the operational access road will result in the loss of an existing surface water flood storage basin. This must be replaced like for like to ensure there is no increase in surface water flood risk to Friston. The 'additional SuDS basin' would have to meet this requirement as a minimum and would not provide any additional benefit until this existing volume is replaced. The basin must serve the same catchment as the existing flood storage basin to ensure that surface water flood risk in Friston is not increased.

Applicants' Comments on Written Representations, Volume 2: Technical Stakeholders, Document Reference: REP2-016, Date: 17th November 2020

Doc reference	SPR statement	SCC Comment
Section 2.16 Page 114	The Applicants note that SCC (as the Lead Local Flood Authority) has a policy to keep watercourses open wherever possible and does not support the piping of the marked up watercourses running east-west at the onshore substation locations. The Applicants are preparing an Outline Operational Drainage Management Plan which will be submitted to the Examination at Deadline 3.	The Applicants have now provided the Outline Operational Drainage Management Plan at Deadline 3. As such, SCC are now able to comment on this. Details to address SCC's concern have not been provided as part of the submitted Outline Operational Drainage Management Plan. As such, it is still not known how the Applicant proposes to manage the watercourse running east to west that is directly on the line of the proposed NG substation. This is a serious concern for SCC which could ultimately result in an increase in surface water flood risk to the development and to downstream receptors such as Friston.

Outline Operational Drainage Management Plan, Document Reference: REP3-046, Date: 15th December 2020

Paragraph No.	SPR statement	SCC Comment
31	This Outline Operational Drainage Management Plan is informed by existing documentation at the time of production.	No detailed assessment of Friston Surface Water Management Plan (SWMP) has been undertaken. The Outline Operational Drainage Management Plan reiterates information contained within the SWMP but there is no assessment of how this affects/informs the surface water drainage strategy and in particular the Outline Operational Drainage Management Plan. As such, this SPR statement is not correct.
Table 3.1 – Data Sources	Environment Agency's Risk of Flooding from Surface Water assigned high confidence	The Environment Agency's website states; *"The results are an indicator of an area's flood risk, particularly the likelihood of surface water flooding. It is not suitable for identifying whether an individual property will flood. It does not include the flood risk from sources such as blocked drains and burst pipes."* On this basis, and as per previous SCC representations, this information is not suitable to be used with a high level of confidence. This level of confidence could be assigned to the Friston Surface Water Management Plan.
45	The National Grid substation, National Grid Construction Consolidation Site (CCS), cable sealing end compounds and permanent substation operational access road are located in an area with varying risk of surface water flooding. The northern and western boundary around the National Grid substation, including the cable sealing end compounds, and part of the footprint of the National Grid substation, includes areas at both high risk of surface water flooding (i.e. greater than 1 in 30 annual probability of surface water flooding) and medium risk of surface water flooding (i.e. between 1 in 100 and 1 in 30 annual probability of surface water flooding). This flood risk is	This flood risk is associated with a series of ordinary watercourses, one from the north, in proximity to Little Moor Farm, the other from the east. The National Grid substation is located directly on the line of these watercourses. It is unclear how these watercourses will be facilitated alongside the development whilst complying with Suffolk County Council Policy to resist the piping of ordinary watercourses. Whilst it is acknowledged that this will be the subject of a Land Drainage Act Consent application, SCC have serious concerns on this matter which could ultimately result in an increase in surface water flood risk to the development and to downstream receptors such as Friston.

	associated with the drainage of surface water from the north in proximity to Little Moor Farm.	
57	The modelling report by BMT (BMT, 2020) does not appear to have carried out a detailed rainfall analysis or provided a conclusion on the return period for the October 2019 rainfall event. SCC indicated via email (25th September 2020) that the return period for this rainfall event was equivalent to approximately a 1 in 42-year event.	Minutes from ETG 19/11/2019 state: *"MW indicated that the event on 6th October has been confirmed by the Environment Agency as being equivalent to a 1 in 40 year event. Other rain gauges in the wider area indicated a return period of approximately 1 in 5 or 1 in 10 years. This difference may indicate that, due to limited historic data, the rainfall in Friston was of this magnitude, or that the rainfall event was more localised and heavier in the Friston area."* As such, the statement contained in the Outline Operational Drainage Management Plan is misleading. SCC has no record of an email dated 25th September 2020 and requests clarification from the Applicant.
60	It also notes that the Friston River drains a catchment area of approximately 11km2 to the southeast of Saxmundham	As per previous SCC representations, this is the wider Friston River hydraulic catchment and not the catchment of Friston village itself.
62	This is supported by the BMT (2020) report which suggests that soil types present in the upper catchment are very permeable, with many perforated pipes used to drain the soils, all of which contribute flow to the field drainage ditches and feed the lower catchment. The superficial geology is glacial till and eroded fluvial deposits. The upper catchment is predominately made up of clay soils. In the village the soils become sandier.	The Applicants are requested to clarify where exactly the BMT report states that soils in the upper catchment are 'very permeable'. Additionally, the document goes on to acknowledge the upper catchment (the area for proposed development) is predominantly made up of clay soils. These two statements are contradictory.
65	Subsequently BMT developed a 2D model to investigate surface water runoff in the Friston catchment and the flooding to Friston in October 2019. The results of this modelling will be considered to inform the drainage	Why has the SWMP modelling not been considered at this stage? The Applicant must not only use the existing model but they should build on and develop the model further.

<table>
<tr><td></td><td>design for the onshore substations and National Grid infrastructure.</td><td></td></tr>
<tr><td>70</td><td>The final Operational Drainage Management Plan will be produced to include details of the scope and extent of soil surveys required to determine the existing infiltration potential of the soils within the catchment.</td><td>The final Operational Drainage Management Plan should include the results of infiltration testing on which the design is based. The scope and extent of the soil surveys will need to be determined well in advance of this. This suggestion is illogical. There is no reason why these details cannot be agreed now.</td></tr>
<tr><td>72</td><td>Runoff rates in Table 3.3 below are expressed under two methods. The first is based on the Flood Estimation Handbook (FEH) produced by the UK Centre for Ecology and Hydrology. The second is ‘IH124’ which was developed by the Institute of Hydrology3 . Although shown to be slightly less accurate than more recent FEH based methods, the IH124 method is still considered to be an acceptable approach for assessing greenfield runoff rates.</td><td>Whilst both methodologies are recognised, CIRIA SuDS Manual states a clear preference for the use of the FEH methodology wherever possible; “FEH methods should be the preferred approach for developing runoff estimate for use in surface water management design”. Given FEH outputs provide a more conservative approach and given the existing surface water flood risk in Friston, this is the approach supported by SCC. SCC request that the use of IH124 methodology is removed from calculations for clarity.</td></tr>
<tr><td>75</td><td>The surface water drainage strategy adopted for the Projects will incorporate both infiltration and attenuation prior to discharge to a surface water body.</td><td>SCC LLFA do not support this approach. If infiltration is proven to be achievable and viable then this must be utilised, as per the surface water disposal hierarchy. If infiltration is not shown to be achievable or viable then infiltration cannot be factored into the design of an attenuation and positive discharge system.</td></tr>
<tr><td>80</td><td>For the onshore substations and National Grid infrastructure, the storage will be designed to accommodate runoff from a 1 in 100 year storm event plus a 20% additional allowance for climate change. These measures will limit the runoff to the equivalent of the pre-existing greenfield (undeveloped) runoff rate</td><td>The design attenuation storage for both attenuation basins falls well short of the required attenuation volume (even when only accounting for 20% climate change) for each substation. These figures are taken from Outline Operational Drainage Management Plan, Appendix A: SuDS Design Summary Assumptions.
<table>
<tr><td></td><td>Storage req. (m^3)</td><td>Design storage (m^3)</td></tr>
<tr><td>EA1N/EA2</td><td>9669.9</td><td>5927.6</td></tr>
<tr><td>NG</td><td>6445.6</td><td>4069.5</td></tr>
</table></td></tr>
</table>

		As per the above figures, the design storage of each basin is far below the storage required. The projects rely on flooding wider areas, beyond the attenuation basin, during the 1:100+20% event. Utilising freeboard and the perimeter access track for storage during the design storm event is not compliant with local and national guidance. This approach demonstrates a clear increase in surface water flood risk. Further comments on this point are contained below in response to Appendix A (SuDS Design Summary Assumptions) of this document. A maximum design water depth of 1m would be acceptable, a minimum freeboard of 300mm should be provided with a total basin depth of 1.5m
81	A sensitivity check will be carried out for a 1 in 100 year storm event with a 40% allowance for climate change to ensure there is no off-site flooding for this storm event.	The calculations provided demonstrate there is an increase in off-site flood risk during the 1:100+40% event. As a result, this sensitivity test has not been met. The degree of failure (cumulatively 2,661.6m^3) is considered a significant failure and a significant increase in surface water flood risk.
84	A review of the pollutant removal measures will be carried out in accordance with CIRIA C753 SuDS Manual (CIRIA, 2015).	A review of whether the proposed SuDS provides sufficient treatment of surface water must be completed at this stage. Failure to do so could result in insufficient space being allocated for SuDS and thus proprietary treatment measures being implemented at a later date, contrary to NPS EN-1.
92	Parts of the substation operational access road are likely to cross areas at both high risk of surface water flooding (i.e. greater than 1 in 30 annual probability of surface water flooding) and medium risk of surface water flooding (i.e. between 1 in 100 and 1 in 30 annual probability of surface water flooding)	This road will intersect an existing ordinary watercourse and an existing surface water flood storage basin. The identified surface water flood risk is associated with these existing features. Whilst the watercourse will be subject to land drainage consent and thus SCC have an element of control, the existing surface water flood storage basin will not be

		protected under the Land Drainage Act 1991. Therefore, details on how this feature will be replaced to prevent an increase in surface water flood risk to Friston must be provided now.
93		Incorrect reference to section proposing production of catchment hydraulic model
94	In addition, the Applicant retains the option to install further attenuation measures along the existing surface water flow route during the detailed design phase to reduce water in-flow rates to the onshore substation and National Grid infrastructure area and potentially reduce flood risk for the village of Friston, in addition to the surface water drainage strategy currently proposed.	Whilst the intention of this (to reduce existing surface water flood risk to Friston) is supported, the operational access road will result in the loss of an existing flood storage basin. This must be replaced like for like to ensure there is no increase in surface water flood risk to Friston. The 'additional SuDS basin' would have to meet this requirement as a minimum and would not provide any additional benefit until this existing volume is replaced. The basin must serve the same catchment as the existing flood storage basin to ensure that surface water flood risk in Friston is not increased.
95	The specifications of this additional 'surface water management SuDS basin' will require development of an appropriate catchment hydraulic model. The detailed design of the onshore substations and National Grid infrastructure will include the size, volume and location of this basin.	An additional basin would require the work stated by SPR. However, replacement of the existing surface water flood storage basin with a like for like feature would not require such modelling and must be done now to ensure there is no increase in surface water flood risk to Friston.
96	A new outfall pipe will be installed to manage runoff from the onshore substations and National Grid infrastructure to the existing Friston watercourse in the vicinity of Church Lane.	This outfall pipe would only be required if a positive discharge to the Friston Main River was required, i.e. infiltration was proven not to be achievable or viable.
98	The infiltration rate or discharge rate to the Friston watercourse will be calculated based on the results of site specific geotechnical and infiltration surveys (as per section 3.4.	Section 3.4 only proposes to undertake a detailed topographic survey.
99	Maintenance of the onshore substations and National Grid infrastructure drainage systems (to the point of connection to the Friston watercourse) will be the responsibility of the site operator during the operational phase of the Projects (until the site is decommissioned).	SCC are conscious that through Written Questions the ExA have previously asked the Applicants of their intentions for long term SuDS adoption & maintenance. SCC wish to highlight that the details contained within this document are somewhat ambiguous when compared to the Applicants

		response to Written Questions on this topic.
102	Land Drainage Consent associated with temporary and permanent works at the Projects' and NG onshore substations would be applied for separately to Land Drainage Consent for temporary construction works along the onshore cable route. An application for Land Drainage Consent in respect of the onshore substations and National Grid infrastructure works will be submitted to the LLFA post-consent and will include details of the measures to be implemented in relation to any affected Ordinary Watercourses.	Whilst it is noted that the Applicant intends to apply for Land Drainage Consent post-consent, this presents a problem. The National Grid substation is directly on the line of an existing ordinary watercourse. SCC have no details RE how this watercourse would be facilitated. SCC Policy would not accept piping or pumping. A diversion may be possible but given the proposals and site topography, it is unclear whether this is possible. It would be prudent for the Applicant to put some thought to this issue and provide a potential solution so SCC can see there is a feasible solution available. If the Projects obtain DCO consent but there is not a SCC policy compliant solution available for the re-routing of this watercourse, what would be the next course of action? It makes sense to address this now.
Appendix A – SuDS Design Summary Assumptions		1. Calculations demonstrate that the required attenuation volume for 1:100 + 20% **cannot** be accommodated without utilising freeboard. Thus, leaving the basin without any freeboard during the critical event. Freeboard must not be used for the design event. CIRIA SuDS Manual defines 'freeboard' as *"distance between the design water level and the top of the structure, provided as a precautionary safety measure against early system failure"*. A freeboard of 300mm above the design water level is considered acceptable. 2. SCC LLFA maintains its position that the Projects should be using 1:100+40% as the design event, 3. The calculations demonstrate a combined flood volume of 2,661.6m3 during 1:100+40% that is not proposed to be retained within the site, hence increasing surface water flood risk in Friston. To be clear, it is SCC LLFA's view that the above points are

		entirely unacceptable and represent a significant increase in surface water flood risk off site, specifically to Friston. This is contrary to national and local policy. The Applicant has provided no explanation as to why they deem this to be an acceptable approach. 4. No plans have been provided to illustrate the plan area of the basins in relation to the proposed Projects. This plan should include dimensions for the basins. 5. No plans or sections have been provided to illustrate the location and design of swales. 6. The calculations suggest that the post-development run off rate would be limited to the greenfield 1 in 2 year event. Could this please be confirmed? If so, this is a significant betterment to existing runoff rates and should be highlighted as a design criterion within the report. This should be used to demonstrate the Projects can comply with volume control requirements for the 1 in 100, 6 hour event. 7. As per earlier response to Para 80, the detention basin design volumes fall well short of the attenuation storage volume required based on proposed impermeable areas. 8. No breakdown of these calculations has been provided. For example, greenfield runoff calculations and MicroDrainage calculations must be provided to support the basic details that have been provided. 9. Sections through the proposed basins should be provided with water levels for 1:1, 1:30 & 1:100 (all with CC) shown on the sections.

		10. SuDS sizing has been estimated using FSR rainfall, despite SCC stating a clear preference for the use of FEH rainfall.
		At no point in this document is it made clear that infiltration must be prioritised. Indeed, no reference is made at all to the SuDS Infiltration Note submitted previously by the Applicant. The SuDS Infiltration Note should be integrated into this document. This document should then clearly state that infiltration will be pursued primarily as per the SuDS Infiltration Note, with an attenuation and positive discharge approach only being pursued if infiltration is demonstrated to be unachievable or unviable. Read in isolation, this document seeks to pursue an attenuation and positive discharge approach, contrary to national and local policy & guidance.

Outline Watercourse Crossing Method Statement, Document Reference: REP3-048, Date: 15th December 2020

Paragraph No.	SPR statement	SCC Comment
Section 3		There are no details for the specific works proposed to ordinary watercourses but in principle, the techniques outlined in section 3 are acceptable methods to use for temporary works to the watercourses. With regards to the permanent works, careful consideration must be considered to ensure proposals are in keeping with SCC policy and guidance (see below response to paragraph no 71).
54	No materials will be stored within Flood Zone 2 or Flood Zone 3 along the length of the onshore cable route.	In addition to this, no materials should be stored on identified surface water flow paths
61	The Applicant has reduced the working width of the onshore cable route where the cables cross the Hundred River from 50m to 40m. This working width applies for a distance of 40m from the Hundred River's western bank and eastern bank (the Hundred River crossing buffer)	As per previous SCC representation, it is unclear how surface water will be managed in areas with reduced working widths.
62	The width of the onshore cable route between Aldeburgh Road (to the west of the Hundred River) and 40m from the western bank of the Hundred River will be reduced to 16.1m where a single project is constructed, or 27.1m where the onshore cables/ducts for East Anglia TWO and East Anglia ONE North are installed in parallel	As per previous SCC representation, it is unclear how surface water will be managed in areas with reduced working widths.
71	Land drainage consent associated with temporary and permanent works at the East Anglia TWO, East Anglia ONE North and National Grid onshore substations would be applied for separately to land drainage consent for temporary construction works along the onshore cable route. An application for	Whilst it is noted that the Applicant intends to apply for Land Drainage Consent post-consent, this presents a problem. The National Grid substation is directly on the line of an existing ordinary watercourse. SCC have no details RE how this watercourse would be facilitated. SCC Policy would not accept piping or pumping. A diversion

	land drainage consent in respect of the onshore substations and National Grid infrastructure works will be submitted to the LLFA post-consent and will include details of the measures to be implemented in relation to any affected Ordinary Watercourses.	may be possible but given the proposals and site topography, it is unclear whether this is possible. It would be prudent for the Applicant to put some thought to this issue and provide a potential solution so SCC can see there is a feasible solution available. If the Projects obtain DCO consent but there is not a SCC policy compliant solution available for the re-routing of this watercourse, what would be the next course of action? It makes sense to address this now.
96	The final Watercourse Crossing Method Statement will be prepared post-consent in accordance with this Outline Watercourse Crossing Method Statement in line with Requirement 22 of the draft DCO (document reference 3.1). The Applicant will consult with the relevant planning authority, Natural England and the Environment Agency during the preparation of the final Watercourse Crossing Method Statement to ensure appropriate mitigation measures are incorporated within the works.	The Lead Local Flood Authority and Internal Drainage Board must also be consulted during the preparation of the final Watercourse Crossing Method Statement in relation to Ordinary Watercourses.

Outline Code of Construction Practice, Document Reference: REP3-022, Date: 15th December 2020

Paragraph No.	SPR statement	SCC Comment
8	The Applicant will consult with the Environment Agency during preparation of the final Watercourse Crossing Method Statement.	The Lead Local Flood Authority and Internal Drainage Board must also be consulted during the preparation of the final Watercourse Crossing Method Statement in relation to Ordinary Watercourses.
37	In addition, where construction working areas are within Flood Zone 2 or 3 additional measures will be taken to minimise pollution risk during periods of extreme weather (i.e. flooding) by including:	These control measures must also be applied to areas of identified surface water flood risk.
38	Where construction working areas are adjacent to watercourses or cross Flood Zone 2 or 3, the following measures will be implemented:	These control measures must also be applied to areas of identified surface water flood risk.
105	Note that management measures of operational stage surface water drainage will be detailed and secured in the final Landscape Management Plan (LMP) produced post-consent to discharge requirements of the draft DCO. The LMP will be based upon the Outline Landscape and Ecological Management Strategy (OLEMS) submitted with this DCO application	This point needs to be updated to reflect the Outline Operational Drainage Management Plan.
108	Construction materials and excavation arisings from trenching activities will not be stored within areas identified as Flood Zone 2 or Flood Zone 3 along the length	These control measures must also be applied to areas of identified surface water flood risk.

	of the onshore cable route, or within the floodplain associated with the Hundred River	
	The drainage system will include drainage channels (or swales) along the length of the onshore cable route to collect surface water runoff and direct it to a suitable point of discharge or soak-away.	As per previous SCC representations, it has not been demonstrated that these mitigation options are deliverable within the redline boundary and comply with national and local requirements of prioritising the surface water disposal hierarchy.
	Attenuation or settlement ponds will be established within the onshore development area to assist in surface water runoff. Where necessary, topsoil and subsoil storage areas along the onshore cable route will be cleared to accommodate attenuation or settlement ponds.	

4. Responses to any further information requested by the Examining Authority for this deadline

4.1 Not applicable.