

Written Submission for Deadline 2

Response from the Alde and Ore Association (Registered Charity number 1154583)

The Alde and Ore Association exists to protect for the public benefit the Alde, Ore and Butley rivers and their banks from Shingle Street to their tidal limits together with features of public interest. It has some 2000 members.

Summary

The Association wishes to express great concern that:

A.- the Applicant's papers give no confidence that the full implications have been properly considered for building a project within an Area of Outstanding Natural Beauty, and lasting possibly two or more centuries, on a fragile, dynamic coastline against a background of climate change: details of geomorphological history and challenges to EDF assumptions for assessing coastal change are given below;

B.-the proposed plan for Coastal Monitoring and Mitigation is incomplete in geographical coverage and commitment to a full legal and funding framework: it should be extended in geographical scope and time;

C.- the area will be affected detrimentally until at least the medium term to the area: access to even just the Alde and Ore Estuary area will be significantly impeded by the massive traffic levels required to service the project over 10-12 years using an infrastructure which even now, at times, barely covers the normal needs of this rural area, and which will be to the detriment of a substantial key industry which exists because of enjoyment of the area.

Discussions with SZC staff at the Consultation Open days have done nothing to give any confidence that these matters have been fully understood and thought through.

Detailed submission

A. Coastal geomorphology and processes and possible impact on them of the Proposed Development

1. The Applicant's papers present the issues relating to the coast as being confined to the Greater Sizewell Bay, asserting that bay is a self-contained unit.

2. **The Suffolk coast is not divided into separate and discreet sections**, as the Association described at the Oral Hearing. It is the result of a long geomorphological history of deposition, erosion and sedimentation flows along its entire length with successions of deposition and erosion in different places. It is all of a piece and has a long integrated geomorphological history of natural evolution: it is subject to many continuing dynamic forces, principally wind, waves, sea surges and sea level change working on the young geology. This is continuing. The Development Project itself will be a long-term installation lasting a minimum of 160 years and will be a new intrusion in the geomorphological history.

The Applicant's papers dismiss the need to consider anything but the immediate shoreline on which SZC would sit. But SZC would be one installation in one sub area on the edge of the long Suffolk Heritage Coast, designated as such in 1979 and managed by Natural England. The coast is **not** a series of bite size self-contained segments. The report by Professors Jackson and Cooper addressing the BEEMS Technical Report TR311 (for reference see end of this submission) confirms that the entire 70 km long Suffolk coast and adjacent seabed comprise a single large scale coastal system within which geomorphic changes are

intimately linked. (pages 1,3, 11, 18 e.g. *'on a continuous soft-sediment mobile coast like that of Suffolk, changes in one part of the system are intimately related to changes elsewhere', 19(7.4))*

Geomorphological history: This integrated history is evident from its changes over time. Dunwich, to the north of Sizewell, was a major port in Roman and Anglo Saxon times, its port was then silted up because of the north south long term sediment drift, then over the 14th and 15th centuries much of the town fell into the sea with the collapsed cliff material feeding changes in the coastline miles to the south, then the Minsmere River which was a harbour became silted up and is now the site of the valuable Minsmere reserve. Moving further south the harbour to the north of Aldeburgh (now North Warren RSPB marshes) silted up in the 17th century although the inward curve of that shoreline did not really fill out until the 19th/20th century. Aldeburgh town once extended further seawards, but two or three streets were washed away in the 18th century. All this time the eastern bank of the Alde and Ore River Estuary was formed by shingle drifting south, with the spit forming the estuary extending as far as Orford by around the end 12th century but then in the stormy period in the 14-15th centuries was extended to about where it is now so by 1600 (it in fact went further in later centuries but was broken through again). The whole length of Orfordness, a unique shingle spit, is a special international site requiring protection. (*SAC Special Conservation Area*)

Now, after millennia of losses and gains and long term net drift south, with many intermittent flows south to north and in and offshore, the coast now consists of the remnants of Dunwich town, extensive shingle beaches to the south including those to be affected by the actual building of SZC, Thorpeness Cliffs with at sea level the Coralline Crag, the shingle shore to Aldeburgh, manmade sea defences, the unique and very long Orfordness spit which forms the eastern bank of the Alde and Ore Estuary.

In the light of this historical evidence, the Association has found no justification for the Applicant 's papers to maintain that the Greater Sizewell Bay is a self-contained zone and the coast to the south will be unaffected by what is a very long-term project.

The EDF assumption needs examining more closely, and it is right that it will be explored in the coming Issue Specific Hearing on the coast. Any development which is likely to affect coastal sedimentation flows and currents needs to take account of impacts along the length of the coast, not just in the vicinity of the Greater Sizewell Bay. Such impacts could affect the need for coastal defences or lead to the loss of existing natural formations which contribute to the economy, settlements and environmental features such as Orfordness, at least as far south as Shingle Street. Jackson and Cooper point out the effects of introducing an artificial headland into a mobile coastal system (pages 9, 10/11 Section 5 including hard structures altering erosion patterns for tens of kilometres possibly more compared with the 'ca. 1 km alongshore' in the EDF papers, also p. 11 Section 7 introduction, p19 Section 7.4)

3. EDF Principles for assessment of coastal change: EDF's own documents (6.3 Vol 2 Ch 20 Table 26) set out the principles in assessing coastal change and these are given in italics below. It would seem in most cases the assumptions behind the principles take a limited approach and take no account of the precautionary principle. The Alde and Ore Association's comments are listed against each.

1) To adopt a future projection based on "reasonably foreseeable" conditions.

AOA Comment: The problem with this is that over even 160 years, the bare minimum of time the building will be in situ, the assumption of 'reasonably foreseeable', that is extreme events would have a low chance of occurrence, is too minimalist. This is a coast which can experience major overnight changes whether the 1953 inundation, the cliff fall at Thorpeness in 2017, and further back in time the loss of three streets in Aldeburgh or Dunwich town. Also, there were major surges in 1817, 1883, 1912, 1928, 1938, 1949, 1976, 1978 as well as 1953 (Pye and Blott Coastal Processes see full reference below). More recently the 2013 surge caused inundation, storms in 2017 affected cliffs. So, the assumption of low occurrence is flawed.

2) *Sea level rise in the year 2070 would be 0.52 m relative to 1990 levels (UKCP18, see Section 2.4.1 and Palmer et al, 2018).*

AOA comment: This does not go far enough forward in time. By the year 2070 the plant, if built by 2035, will still have half its working life ahead and then the nuclear plant buildings will still be in situ for decades, or may be a century or more, until the nuclear waste is disposed of. Sea level rise will not stop in 2070. It is due to rise between 0.6 and 1 metres between 2019 and 2100 and will continue to rise after that, both from isostatic rebalancing and whatever is due to climate change so that it could be just as much again in the 2100s.

3) *Extrapolation of the observed 1991-2018 SLR trend accounts for 68% of the UKCP18 SLR prediction at 2070, which implies that the observed shoreline response already includes a significant element of shoreline response due to SLR. Accordingly, an additional sea level rise of 0.17 m (the UKCP18 prediction) is considered in determining the shoreline response at 2070.*

AOA comment: the same point as made at 2 above applies: continuing sea level rise will continue to affect the physical building and its impact on the coast long after it has ceased to operate and until it can be demolished should a solution to storing nuclear waste ever be found. Jackson and Cooper also comment on the impact of sea level rise affecting shoreline behaviour including its interaction with sandbanks (page 7) which they consider is not fully addressed.

4) *The offshore wave climate remains unchanged (UKCP18 indicates small reductions in mean and annual maximum significant wave height)*

AOA Comment: Recent work by Professor David Sear, Southampton University with Professor Mark Bailey has shown that the coastal change in Suffolk is markedly affected by waves which themselves are substantially influenced by the North Atlantic Oscillation (NAO)- for example between the late 1200s and 1600 the NAO caused substantial build-up of the Orfordness Spit from Orford, (the part between Aldeburgh and Orford having built up the same length over a longer period mostly in the previous 8 centuries) (Ref Mark Bailey's lecture <https://www.youtube.com/watch?v=0JJ1149ZrZA&feature=youtu.be>).

Jackson and Cooper also refer to the NAO page 16 first two paragraphs and also under assessment of the wave regime pages 4/5. This long-term consideration is missing from the principles.

5) *The inshore wave climate remains unchanged*

AOA Comment: How can this be a valid assumption when waves are dominated by climatic oscillations which are likely to change during the next 160 years, the minimum physical life of the plant?

6) *Minsmere Outfall remains physically in place until the sluice is no longer a functional element of Minsmere Levels drainage (due to SLR).*

AOA Comment: If the sluice is silted up that is likely to be due to the project construction becoming increasingly a projection into the sea which is likely to block sediment normally going south this and so this event is of relevance to the whole of the coastline.

7) *No shoreline accretion, and shoreline sinuosity remains similar to that at present.*

AOA Comment: The science behind coastal erosion is still developing and over the coming 150 years such a simple assumption cannot be justified. In a paper written in 2016 by H Burningham and J French 'Understanding coastal change using shoreline trend analysis supported by cluster-based segmentation' (Geomorphology Journal 282 (2017) 131-1549) the authors explored a new approach to examining coastal change as it is often highly linear and may show complex behaviour including trend reversals taking entire the 74 miles of the Suffolk coast. They found that there was a very complex range of behaviours and that while continuing sea level rise drives erosional and steepening along the coast as a whole, the presence of structural control (manmade or natural) exerts a complex influence on erosion processes and sediment movement. Further the relative importance of wave direction and potential variability with regional climate changes such as the NAO appears to exert an important control on sediment transport direction alongshore.

8) No change in the 'Hold the Line' status for Blyth river jetties, as per the SMP [Shoreline Management Plan] across all three epochs. "

No comment.

Missing assumptions: The Association notes that the assumptions take no account of the fact that all forecasts indicate climate change will not only bring sea level rises but more frequent and more violent storms. As a coast already subject to considerable winter surges, these, combined with sea level rise, will heighten the damaging effect of the sea on the coast.

4. Long-term coastal implications of the construction: The Association wishes to point out the long-term implications of the Proposed Development structure- it will be in place decades, possibly hundreds of years or more after the completed project is decommissioned in 70 or so years' time. As the Applicant recognises, it will protrude into the sea even during the time the Project is in operation and so proposes that shingle recycling will be necessary to protect the front. Such recycling is likely to have an impact further south along the coast, but the documents only mention it in terms of safeguarding the Hard Core Defence Front, ignoring or unaware of wider implications. Looking at it another way, Jackson and Cooper comment on the potential inadequacy of the planned recycling and nourishment page 20 Section 5.

5. Building on a fragile, dynamic coast: The coastline into which the project will protrude is a fragile and dynamic one. The construction and recycling actions could well have a detrimental impact in blocking sedimentation flows and the natural supplies which have led shingle deposits protecting the shoreline and coastal formations such as the Orfordness Spit to the south.

6. Unknown impacts because of incomplete plans: Complete assessment by Interested Parties of the likely coastal impact is also prevented as the Development Application is incomplete. There are no final plans on how the Hard Core Defence Front will be designed, making it impossible to make an assessment of the impact it may have on coastal flows. The supplementary consultation in December 2020 contained adjusted ideas but, again, not enough to be able to provide comments. Further, there are revised ideas for a permanent beach landing platform and temporary landing facilities, again exactly what is unclear. And, as yet the impact has not been assessed by the Applicant. These are to be examined in an Issue Special Hearing on coastal impact so no more will be said here.

B. A Coastal Monitoring and Mitigation Plan.

1. A plan is proposed by the Applicant, but its scope is highly localised and makes no allowance for longshore impacts in neighbouring parts of the coast which have been highlighted in the preceding sections. It omits considering Policy Development Zone 5 (Thorpeness to Orfordness) of the Suffolk Shoreline Management Plan². Appendix C of a Review of Coastal Processes and Geomorphology by Royal Haskoning in 2009 for the Suffolk Shoreline Management Plan² included the comments that *"Changes in the rate of littoral drift or changes in the severity of wave action could affect the stability of Orford Ness, from the Martello Tower to Orford Haven. "Orford Ness is a shingle cusped foreland that shows changes in elevation attributed to changes in sea-level rise during its formation. Birkbeck College and Babbie (2000, henceforth BC&B) report that it appears to have formed since the rate of sea level rise slowed around 6000 years ago and was probably formed from a spit. It has been supplied with sediment by longshore transport from the north."* *"The shingle of Orford Spit has been largely derived from the exposures of the Pleistocene, Westleton Beds that outcrop on the Suffolk coast between the Minsmere and Hundred Rivers"*. The report also comments that there was, at the time of writing, both a north and south drift depending on wind/wave direction, but the overall trend is southwards: this illustrates the dynamic and changeable coastline.

2. The EDF papers do recognise that once the project starts protruding into the sea, after about 50 years of being put in place because of the receding shoreline over time, the sediment will be trapped to the north affecting the coast there with deposition and possibly blocking natural sediment flows southwards.
3. Monitoring should therefore include some assessment of sediment drift levels in both directions, particularly before and during the time of shingle recycling at SZC. Therefore, any monitoring and mitigation plan should cover the wider area from Southwold in the north to Shingle Street in the south.
4. To summarise, there needs long term provision for continuing monitoring and for mitigation for all parts of the coast likely to be affected. Without any such protection, coastal changes to the detriment of the local population may force local funding on an area which is being damaged because of actions further north to supply power for the national good.

C. Adverse impact of site construction traffic over 10-12 years using basically inadequate rural road infrastructure.

1. The proposed construction is in an Area of Outstanding Natural beauty and on the Suffolk Heritage Coastline, which includes the Alde and Ore Estuary, which so many people come to visit and enjoy because it is not spoiled and industrialised.
2. In 2013 the Association repeated a 10-year economic study of the value of the Ade and Ore economy, which involved both desk studies and on-the-ground surveys of what people did, valued and spent in the area. This revealed a local economy worth at a minimum about £100 million a year: and we know it was an understated valuation because of data we subsequently obtained. Of this £100 m, tourism and related activities brought in £79 million.
3. When asked to give five words to express why they liked the area, the top words from 275 people, were scenery, peace, tranquillity, countryside, beauty. If access becomes difficult for visitors, and tranquillity is also lost, even a 10% fall off in those enjoying the area would cost the area, updating the 7-year-old figures, possibly about £10 million a year in lost revenue and all the related employment. Nor is the tourism a summer only phenomenon, the area is very popular with visitors in most months of the year- in the peak holiday season, the local population is 3-5 times the normal levels (taking into account the large amount of holiday accommodation).
4. Access to the estuary area depends upon the limited capacity of the A12, which is not even of trunk road capacity, and off that the two roads of minor A road status, the A1152 and the A1094 which leads into Aldeburgh, with two modest B roads B1069 and the B1122 from the north: these are the roads the Applicant wants to use. The Applicant is still seeking limited ways to minimise the impact of the likely traffic load, but the sheer volumes and vehicle sizes needed for the largest building site in Europe will mean the area's limited capacity built only for rural traffic loads will be overwhelmed. Further, HGVs are quite frightening and unsuitable at times as they can take up more than half the width of the local roads. Also, in addition to the HGVs, there will be many countless smaller vehicles providing services, or out of hours leisure time travel by those working on the site, all of which will considerably hamper the normal movements of residents and tourists, schools, emergency vehicles for ambulance and fire. The very narrow roads, even the A road, also have hidden dips which are deceptive to non-local drivers and can easily become blocked. A single incident in summer 2019 with a towed holiday caravan and HGV going in opposite directions became jammed together on the A1094, - led to a two-hour blockage with no escape from Aldeburgh even for emergency vehicles except by circuitous routes. These poor experiences can only increase with the substantial works traffic necessary for the energy projects and it is very likely that tourists seeking to enjoy peace and tranquillity will go elsewhere rather than get stuck in long traffic jams or snarl ups.

5. Finally, **there is the issue of cumulative effect of traffic access.** In addition to the SZC project, currently there are plans for a huge onshore windfarm construction, far bigger than many to date with, it seems, the likelihood for up to a half dozen other projects following in its wake. The cumulative effective of all the energy plants will swamp this Area of Outstanding Natural Beauty and undermine daily life and the key economic business of tourism providing employment in the area. The Association asks that EDF/Sizewell C developer to join with ScottishPowerRenewables and other energy companies and the government to develop a coherent, plan for bringing power on shore to the best placed power distribution network without having to despoil many stretches of a vulnerable coastline and land behind.

Overall, to summarise, in considering the site, the impact on the coastline has not transparently been fully examined, nor account taken of the greater forces of climate change and sea level rise affecting the natural evolution of the coastline, nor that the local economy will be damaged by the massive traffic requirements, and account needs to be taken of the cumulative effect of all energy projects. Should this third Sizewell project be allowed to go ahead, the plans for Coastal Monitoring and Mitigation should not ignore the integral coastal evolution of the area and should be changed to enable damage limitation over a far wider area way south to Aldeburgh onto Shingle Street.

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References:

Response to: SZC-SZ0200-XX-000-REP-100041 Sizewell Coastal Geomorphology and Hydrodynamics: Synthesis for Environmental Impact Assessment (MSR1 – Edition 4) BEEMS Technical Report TR311 By Professor Derek Jackson and Professor Andrew Cooper, May 2021. A copy of this study is attached to the submission of 2 June 2021 by STOP Sizewell

K Pye and SJ Blott 'Coastal Processes and Morphological Change in the Dunwich-Sizewell Area, Suffolk, UK' Journal of Coastal Research May 2006.

H Burningham and J French 'Understanding coastal change using shoreline trend analysis supported by cluster-based segmentation' (Geomorphology Journal 282 (2017) 131-1549)