



Sizewell C Case Team
Planning Inspectorate
sizewellc@planninginspectorate.gov.uk
(Email only)

MMO Reference: DCO/2013/00021
Planning Inspectorate Reference: EN010012
MMO Registration Identification Number: 20025459

30 September 2020

Dear Sizewell C Case Team,

Planning Act 2008, Application by NNB Nuclear Generation (SZC) Limited for an Order Granting Development Consent for The Sizewell C Project

Relevant Representation

On 8 July 2020, the Marine Management Organisation (the “MMO”) received notice under Section 56 of the Planning Act 2008 (the “PA 2008”) that the Planning Inspectorate (“PINS”) had accepted an application made by NNB Nuclear Generation (SZC) Limited (the “Applicant”) for a development consent order (the “DCO Application/DCO”) (MMO ref: DCO/2013/00021; PINS ref: EN010012).

The Development Consent Order Application includes a draft development consent order (the “DCO”) and an Environmental Statement (the “ES”). The draft DCO includes, at Schedule 20, a draft Deemed Consent under Part 4 (Marine Licensing) of the Marine and Coastal Access Act 2009 (the “Deemed Marine Licence/DML”).

The DCO Application seeks authorisation for the construction, operation and maintenance of the Sizewell C Project, comprising of two nuclear reactor units together with associated onshore and offshore infrastructure and associated development (the “Project”). The marine elements of the Project include a cooling water system comprised of intake and outfall tunnels, a combined drainage outfall in the North Sea, a fish return system, a beach landing facility, and sections of the sea defences that are, or will become, marine over the life of the project.

This document comprises the MMO’s initial comments in respect of the DCO Application in the form of a relevant representation. This is without prejudice to any future representation



the MMO may make about the DCO Application throughout the examination process. This is also without prejudice to any decision the MMO may make on any associated application for consent, permission, approval or any other type of authorisation submitted to the MMO either for the works in the marine area or for any other authorisation relevant to the proposed development.

Yours faithfully


Ellen Mackenzie
Marine Licensing Case Officer
D +44 (0)2087200961
E Ellen.Mackenzie@marinemanagement.org.uk



Contents

1. General comments on the application.....	4
1.1 Major Comments.....	4
1.2 Minor Comments.....	4
2. Development Consent Order (DCO).....	5
2.1 DCO Interpretations, Articles and Requirements Comments.....	5
2.2 DCO Part 6 'Harbour Powers' Comments.....	9
3. Deemed Marine Licence (DML) – Schedule 20	13
3.1 DML Schedule 20 Comments	13
4. Other Application Documents	22
4.1 General Comments.....	22
4.2 Coastal Processes Monitoring and Mitigation Plan (BEEMS TR523)	22
5. Environmental Statement (ES): Volume 2 – Main Development Site	24
5.1 Chapter 20 – Coastal Geomorphology and Hydrodynamics	24
5.2 Chapter 21 – Marine Water Quality and Sediments.....	26
5.3 Appendix 21E - Marine Water and Sediment Quality Synthesis (MSR2/6); BEEMS Technical Report TR306 Edition 5.	27
5.4 Chapter 22 – Marine Ecology and Fisheries	28
5.5 Appendix 22E - Sizewell Marine Mammals Characterisation (TR324).....	35
5.6 Appendix 22F - Review of Commercial and Recreational Fisheries activity in the vicinity of Sizewell Power Station: Edition 3 (TR123).....	35
5.7 Appendix 22G - Predictions of Entrainment by Sizewell C in Relation to Adjacent Fish and Invertebrate Populations (TR318)	35
5.8 Appendix 22I - Sizewell C Impingement Predictions Based Upon Specific Cooling Water System Design (TR406)	36
5.9 Appendix 22J - Modelling of Sediment Dispersion of Dredge Material for SZC Construction and Operation (TR480).....	37
5.10 Appendix 22L - Underwater Noise Effects Assessment for Sizewell C: Edition 2 (TR312).....	37
5.11 Appendix 22N - Sizewell C Draft Marine Mammal Mitigation Protocol (MMMP) (TR509).....	38
5.12 Appendix 22O - Eels Regulations Compliance Assessment.....	38
5.13 Chapter 24 – Marine Navigation	39
6. Shadow Habitats Regulations Assessment (HRA)	39
6.1 General Comments.....	39
6.2 Comments on Volume 1: Screening and Appropriate Assessment Part 1 of 5	40
6.3 Comments on Volume 1: Screening and Appropriate Assessment Part 4 of 5	44
6.4 Comments on Volume 2: Stage 3 Assessment of Alternative Solutions	44
6.5 Comments on Volume 3: Stage 4 Imperative Reasons of Public Interest.....	44
7. References	44



1. General comments on the application

1.1 Major Comments

- 1.1.1 The MMO has major concerns relating to the arbitration process outlined in Part 7, Article 82, and the appeals process outlined in Schedule 23 of the DCO. Our concerns are highlighted in section 2.1.
- 1.1.2 In addition, the MMO has concerns about the timeframes for submission of documents. We advise that a 6-month lead period (prior to the commencement of activities), would be more appropriate to allow sufficient time to review the submissions and resolve any issues; the submissions may require multiple rounds of consultation and the shorter the lead time, the higher risk that there will be delays to the Applicant's project delivery timeframe.
- 1.1.3 The MMO has major concerns about the inclusion of Unexploded Ordnance (UXO) clearance works within the DCO and DML, and we propose that this should be removed and consented via a separate marine licence. This is explained in section 3.1
- 1.1.4 The MMO has concerns about the inclusion of harbour powers in Part 6 of the DCO and we recommend that the 'Harbour Powers' provisions are thoroughly reviewed by the PINS legal team. The MMO Harbour Orders Team is happy to offer further advice on this throughout the consenting process. This is detailed in section 2.2.
- 1.1.5 The MMO agree with the approach taken in relation to equivalent adult value (EAV) and stock areas. However, the MMO advises that more evidence should be provided to justify the assumptions on the beneficial effect of the low velocity side-entry (LVSE) design and to justify not installing an acoustic fish deterrent (AFD) system. Furthermore, it is likely that additional discussions will be required concerning the design and operation of the fish recovery and return (FRR) system, including monitoring of impingement and FRR survivability. As with other consented NNB projects, it is possible to make agreement on these matters a condition of the DCO and DML. Our reasoning for this is detailed in section 5.4.1.
- 1.1.6 The MMO notes that the coastal defence features will be positioned landward of current Mean High Water Springs (MHWS). As this is outside of the MMO's jurisdiction, the conditions in the DML relating to these works will not be enforceable by the MMO. These conditions will need to be secured elsewhere in the DCO so that they can be enforced by East Suffolk Council. See more details in paragraph 3.1.5.
- 1.1.7 The MMO is also concerned about the level of detail provided in the application documents. Throughout the application, particularly in the Habitats Regulation Assessment (HRA), the level of detail provided is lacking. This has made it difficult for the MMO to come to robust conclusions, and therefore uncertainty remains. We look forward to further details being provided by the Applicant ahead of examination to allow the MMO to have confidence in the examination.

1.2 Minor Comments

- 1.2.1 The Applicant should demonstrate that they have considered whether the project adheres to all the relevant marine plans and policies in the area. The MMO recommends that this is presented in a single, coherent document instead of a



number of separate references throughout the submission. The relevant marine plan policies that should be met can be identified using the Explore Marine Plans tool and policy information on the following website:



1.2.2 Please note that our comments in relation to the Water Framework Directive are discussed as appropriate throughout our response and not as an individual section.

2. Development Consent Order (DCO)

2.1 DCO Interpretations, Articles and Requirements Comments

2.1.1 In relation to Part 1, Article 2, 'Interpretations', the MMO advises that the Applicant should provide a definition for both 'onshore' and 'offshore'.

2.1.2 In relation to Part 1, Article 2, 'Interpretations', the MMO seeks further clarification on the definition of 'commence' within the DCO and DML. The definition in the DCO excludes operations consisting of '(a) site preparation and clearance works'. However, the MMO notes that under the Marine and Coastal Access Act 2009 (MCAA) some ground preparation works may be licensable (e.g. dredging). Consequently, the Applicant should clarify what marine works are excluded from the definition of commence.

2.1.3 In relation to Part 2 Article 4 (1)(a), the MMO notes that 'the undertaker may deviate vertically to any extent found necessary or convenient'. This allows for structures to move in the plan position which is a critical issue for the hard Coastal Defence Feature (hCDF), the final design of which is not complete. Additionally, there is no detail about whether there are any horizontal limits of deviation. The MMO advises that the Applicant provides information on the limits of deviation dimensions applicable to the plan position of the hCDF and any other marine structures to allow for further consideration potential impacts.

2.1.4 In relation to Part 7, Article 82, 'Arbitration', the MMO strongly disputes the requirement for an arbitrator for matters under which the MMO are the enforcing body for its statutory functions via the DML. The MMO position is that any matter in relation to the DMLs should not be subject to arbitration. This is for the following reasons;

- a) The MMO's position is that the Applicant should rely on judicial review to challenge any decision of the MMO. The private nature of the arbitration process does not align with the public functions and duties of the MMO. The removal of the MMO decision-making function, and its placement into the hands of a private arbitration process, is inconsistent with the MMO legal function, powers and responsibilities, which was never intended by Parliament in enacting the Planning Act 2008 or MCAA 2009.
- b) The MMO also consider that arbitration would not be consistent with p.4 of Annex B of the PINS Guidance Note 11, which states that "the MMO will seek to ensure wherever possible that any deemed licence is generally consistent with those issued independently by the MMO". Inclusion of a different mechanism for determination of disputes in respect of DMLs would not be consistent with Marine Licences issued independently by the MMO.



- c) It is the MMO's position that the scale and importance of Nationally Significant Infrastructure Projects (NSIPs) mean that sufficient time is required to ensure a scientifically robust judgement is made. Leaving such decisions to a private third party is not appropriate, particularly when imposing an arbitrary time period.
- d) The offshore and onshore elements of this project are complex and therefore require complex decisions. Such decisions should be made by the public body tasked with doing so, not a private third party which are not subject to judicial review or the same statutory requirements as the MMO.
- e) The arbitration process would remove both parties from the right to appeal; removing the appeals route for the MMO against the decisions of an arbitrator is extremely concerning to the MMO.
- f) It is also the MMO's position that providing for disagreements to be resolved by arbitration (in private) sits uneasily with the general presumption regarding transparency and public participation in environmental decision making.
- g) The MMO considers that the practical result of allowing the arbitration process to expressly apply to the MMOs decisions would be establishing a new procedure and would replace the review of the MMOs decision making on conventional public law grounds (via the process of judicial review), for discharge of conditions under an expressly granted licence, with a merits review undertaken by an arbitrator.
- h) The MMO draws your attention to the clear and well-established principle that the Courts will be very slow to conclude that an "expert and experienced decision-maker assigned the task by statute has reached a perverse scientific conclusion": *Mott v Environment Agency* [2016] 1 W.L.R. 4338 (CA). In light of this, the MMOs view is that it would require clear and compelling evidence as to why it is necessary and appropriate (and/or what had been intended by Parliament) to conclude that that heightened level of discretion given to decisions of a statutory body in the technical/environmental field be displaced by a decision by a private third party arbitrator.
- i) To entrust the final decision in the event of a dispute to an arbitrator, who is not susceptible to the same public scrutiny (not just by the MMO and Applicant but affected members of the public) or appeal is in the MMO's opinion, inconsistent with the objectives of the 2008 Planning Act and MCAA.

The MMO therefore suggest that this Article is amended to include the following proposed wording:

'(6) Any matter for which the consent or approval of the Secretary of State or the Marine Management Organisation is required under any provision of this Order shall not be subject to arbitration.'

This is in line with the recently consented Norfolk Vanguard project where it is explicitly stated in the DML that the MMO shall not be subject to arbitration.

2.1.5 In addition to this, the MMO notes Article 83 'Procedure in relation to certain approvals etc.', and Schedule 23 'Procedure for approvals, consents and appeals' which outline timeframes for decision making by discharging authorities. The MMO



should not be bound by these timeframes which conflict with timeframes detailed in the DML, and this should be made explicit in these sections of the DCO.

- 2.1.6 Furthermore, the MMO does not agree with the appeals process outlined in Schedule 23, Article 3. This section proposes changes to the Marine Licensing (Licence Application Appeals) Regulations 2011 (Appeal Regulations). The MMO has major concerns with this approach highlighted in comments 2.1.7 to 2.1.14.
- 2.1.7 The MMO is subject to an appeal process in respect of specific aspects of marine licences granted under Part 4 MCAA Section 73 which provides an appeal process for Applicants of marine licences through the Appeals Regulations. This appeal process is for an Applicant to appeal a refusal of a marine licence or the inclusion of conditions within a licence.
- 2.1.8 If the Applicant wants requires some form of mechanism to be available to appeal in the event that the MMO either fails to make a determination within an appropriate time period or makes a decision to refuse to approve the documentation, this is already available to the Applicant in the form of an escalated internal procedure and judicial review (JR), and therefore including any additional appeal mechanism for the MMO in the order is simply unnecessary.
- 2.1.9 The MMO believes this amendment to the appeals process constitutes a misunderstanding of when the appeal regulations apply. The 2011 regulations apply a statutory appeal process to the decisions the MMO takes regarding whether to grant or refuse a licence or conditions which are to be applied to the licence. However, they do not include an appeal process to any decisions the MMO is required to give in response to an application to discharge any conditions of a marine licence issued directly by us. Therefore, if the DCO were to be granted with the proposed appeal process included, this would not be an appeal procedure broadly consistent with the existing statutory processes. This amendment would be introducing and making available to this specific Applicant a new and enhanced appeal process which is not available to other marine licence holders.
- 2.1.10 This is problematic because it would lead to a clear disparity between those licence holders who obtained their marine licence directly from the MMO and those who obtained their marine licence via the DCO process. This would lead to an inconsistent playing field across the regulated community. Had parliament intended the appeal process to extend to these decisions, whether in relation to NSIPs or the marine licence granted directly by the MMO, then the wording of the Appeal Regulations would have been drafted differently.
- 2.1.11 In addition, the effect of the proposed change, in this case, would be to replace the review of the MMO decision making on conventional public law grounds (via the process of JR), for discharge of conditions under an expressly granted licence, with a merits review by the Secretary of State (SoS). This is a fundamental departure from what Parliament intended, and the MMO can see no justification for such a major change particularly where the purpose of the deemed licence regime under the Planning Act 2008 is essentially to remove the need for a separate application for a licence alongside or following the making of the Order and not to fundamentally change the regulatory regime that applies.



- 2.1.12 The MMO notes that the Planning Act 2008 which set out the regime for DCOs does not have any 'statutory' appeals process either. It works on the basis that the Applicant and those with an interest in the application work with the Examining Authority to agree the terms of the order, but it is ultimately for the SoS to decide on its terms. The way to appeal against the decisions of the SoS to grant the order as made, or refuse the order, is provided for in the Act through the JR process and not by way of an appeal to PINS or to a tribunal.
- 2.1.13 The MMO requests the removal of the appeals process stipulated in Schedule 23 of the DML as the MMO considers it is wholly inappropriate for the DCO to replace the existing appeals process (JR) with a modified version of the appeals route set out in the 2011 regulations for the reasons already set out above.
- 2.1.14 The MMO would like to highlight that there is a current mechanism available to the Applicant should the MMO fail to make a determination within what the Applicant considers to be a reasonable timescale. The Applicant would write to the MMO explaining this and requiring the MMO to make a determination by a specific date. Should the MMO fail to make the decision then the Applicant would be able to judicially review that failure to make a decision. If the MMO were to make the determination, but decided to refuse to approve the documents, the Applicant would again be able to challenge that refusal through JR. This provides a degree of certainty and the Applicant can already be confident of a reliable and consistent approval process.
- 2.1.15 Part 7, Article 86, 'Marine enforcement authority', states that the MMO will be the relevant local planning authority (LPA) for land seaward of mean low water springs. However, our jurisdiction actually covers the area seaward of MHWS (as defined in Section 42 of the MCAA 2009).
- 2.1.16 In relation to Schedule 1 'Authorised Development', the final DCO/DML authorised development should be cross referenceable with the project description and final Environmental Impact Assessment (EIA). The DCO/DML authorised development should be clearly linked to the 'Worst Case Scenario' as outlined within the EIA and it should be clear that the works can be built within the scope of the ES.
- 2.1.17 In relation to Schedule 1, Part 2 'Other Associated Development', the MMO is concerned about the lack of detail provided here for any marine works. For example, '(g) in connection with the marine works, dredging and the provision of buoys, beacons, fenders and other navigational warning or ship impact protection works;'. All dimensions should be clarified, and a 'Worst Case Scenario' identified if the dimensions are not known exactly at this point.
- 2.1.18 The MMO would expect key mitigation documents to be captured within Schedule 2, 'Requirements', for example the Environmental Management Plan. This mitigation must be agreed by the appropriate bodies, and we must be confident that the mitigation will be effective. We would also expect the timing requirements to be provided in the final DCO/DML.



2.2 DCO Part 6 ‘Harbour Powers’ Comments

- 2.2.1 The MMO would like to highlight to PINS that the creation of Harbour Orders is a complex process and the timescales for approval can often take a number of years, depending on the complexity of the proposals. The process involves lengthy discussions between the applicant, the MMO Harbour Orders Team and the MMO Legal Team. The process also includes a final legal check by lawyers at the Department for Transport (DfT) before the Harbour Order is laid before Parliament.
- 2.2.2 As the Applicant wishes to include powers that would normally be created in a Harbour Order within this DCO, the MMO recommends that the ‘Harbour Powers’ provisions are thoroughly reviewed by the PINS legal team. We appreciate that Harbour Orders are not a commonly reviewed area of law, therefore the MMO Harbour Orders Team are happy to offer further advice throughout the consenting process.
- 2.2.3 Additionally, as Harbour Orders are a complex area where review periods can be lengthy, the MMO reserves the right to make additional comments on the provisions in the future.
- 2.2.4 The MMO has reviewed the provisions to create a new harbour authority as if they were in a separate Harbour Order, as this is the legislation the MMO is familiar with when introducing new harbour legislation. Consequently, although comments are outlined below, it will be up to PINS to consider their relevance to the DCO process.
- 2.2.5 The MMO welcomes the addition of Part 6 ‘Harbour Powers’ to the DCO to make it clear that the DCO authorises the creation of a new harbour authority.
- 2.2.6 The MMO notes that the draft DCO appears to create new offences. The MMO has received guidance from the Ministry of Justice (MoJ) that when considering harbour orders which create new offences, a Justice Impact Test must be carried out and submitted to the MoJ for their approval. As the Justice Impact Test is a requirement for Harbour Orders, the MoJ may require this to be done for a DCO that creates new offences. The MMO suggests that PINS contact the MoJ to discuss whether a Justice Impact Test will be required for the new offences within this DCO.
- 2.2.7 As previously advised to the Applicant, DfT will need to be consulted on this application. This is because DfT are responsible for Port Policy and other areas which harbour legislation relates to, for example they are the Secretary of State which confirms harbour byelaws. Other bodies which the MMO advise should be consulted in relation to the harbour powers include the UK Major Ports Group, Chamber of Shipping and the British Ports Association.
- 2.2.8 The MMO also encourages the Applicant to consult with local recreational and fishing vessels to ensure that they are aware of the proposals. Additionally, as non-compliance with a byelaw or direction could be an offence, the Applicant should notify local users of any changes to the byelaws and general directions during the lifetime of the harbour authority, so these users can be properly informed. Keeping copies of directions and byelaws online will assist further here, see further information regarding this in our comment 2.2.18 below.



2.2.9 In relation to Article 46, 'Incorporation of the Harbours, Docks and Piers Clauses Act 1847', the MMO notes that paragraph 8.6 of the Explanatory Memorandum states that:

'Sections 14 -19, 25, 27, 29-34, 36, 40-46, 48 - 50, 81 and 82 relate to the calculation, charging and enforcement of rates by an undertaker on vessels and members of the public. As the undertaker will not be collecting rates, these sections are irrelevant.'

The MMO suggests the Applicant should check the sections listed as not all of them appear to be in relation to rates. For example, section 16 is in relation to lifeboats.

2.2.10 Additionally, in relation to Article 46, the applicant has stated that they will not be collecting rates. The MMO notes that in the 1847 Act, which is being incorporated into this DCO, 'rates' are defined as:

'The word "rate" shall mean any rate or duty or other payment in the nature thereof payable under the special Act'

With 'special Act' being incorporated into the DCO as meaning the Sizewell C DCO. However, Article 72 of the DCO states that charges other than ship, passenger and goods dues may be made. Ship, passenger and goods dues is defined in the Harbours Act 1964 as:

"ship, passenger and goods dues" means, in relation to a harbour, charges (other than any exigible by virtue of section 29 of this Act) of any of the following kinds, namely, —

(a)charges in respect of any ship for entering, using or leaving the harbour, including charges made on the ship in respect of marking or lighting the harbour;

(b)charges for any passengers embarking or disembarking at the harbour (but not including charges in respect of any services rendered or facilities provided for them); and

(c)charges in respect of goods brought into, taken out of, or carried through the harbour by ship (but not including charges in respect of work performed, services rendered or facilities provided in respect of goods so brought, taken or carried);'

The Explanatory Memorandum states that Article 72 enables the undertaker to charge for services performed by them in the exercise and performance of its statutory duties as harbour authority. The MMO seeks clarity from the Applicant on why it is considered that 'rates' will not be collected but charges other than ship, passenger and goods dues may be made.

2.2.11 Article 46 (9)(g) states that the definition of "vessel" in Article 49(1) is substituted for the definition in section 3 of the 1847 Act (Interpretation). The MMO is not clear which Article 49(1) this refers to, and which Act Article 49(1) refers to. Article 49 of the Harbours, Docks and Piers Clauses Act 1847 is in relation to 'rates' and the applicant has stated above that rates are not to be collected, whereas Article 49 of the DCO is in relation to agreements entered into by the undertaker and does not concern vessels. The MMO requests that this is clarified.



- 2.2.12 In relation to Article 50 'Application of Pilotage Act 1987' to become a Competent Harbour Authority (CHA), the MMO notes that a CHA is in relation to Pilotage and is not the same as a Statutory Harbour Authority (SHA). The MMO does not process the creation of CHAs; the method to become one is under separate legislation from the Harbours Act 1964. DfT would be the body responsible for creating CHAs. Therefore, the MMO advise that PINS should discuss this with DfT.
- 2.2.13 Additionally, the Applicant should include a justification of the powers that allow a CHA to be created within the DCO Explanatory Memorandum, just as they have justified the inclusion of the Harbour Order in paragraphs 8.2 and 8.3. In 8.22 of the Explanatory Memorandum, the applicant quoted previous orders where pilotage powers have been given, but they are all specific pilotage orders from a separate legal process to the creation of a DCO, apart from the Wylfa DCO. Moreover, the Wylfa DCO has not yet been confirmed, and so the MMO does not believe that a 'precedent' has been firmly set. The MMO therefore suggest that PINS should undertake a legal review to confirm if it is possible to create a CHA within a DCO.
- 2.2.14 Article 51 (1) refers to 'Schedule 21 (Limits of harbour)'. This appears to be a typographical error as Schedule 21 is entitled 'Removal of important hedgerows'. It appears this article should refer to Schedule 19 instead, which is entitled 'Limits of harbour'.
- 2.2.15 In relation to Article 55, the MMO request further information about the mitigation proposed in relation to the 'Power to Dredge.' It is not clear what process will be followed to ensure that the relevant Statutory Nature Conservation Body are able to view any updated plans and methodologies related to this.
- 2.2.16 The MMO is not clear why 'Rights to lease etc.' is numbered as Article 62(A) rather than Article 62.
- 2.2.17 In relation to Article 64 (1) 'Confirmation of byelaws', the MMO notes that the harbour byelaws will be confirmed by the Secretary of State for Business, Energy and Industrial Strategy, however harbour byelaws are usually confirmed by the Secretary of State for DfT. Therefore, the MMO advises that DfT should be consulted prior to the confirmation of these byelaws and PINS should undertake a legal review to ensure that this is the correct method.
- 2.2.18 In relation to Article 64 (2) 'Confirmation of byelaws', the MMO recommends that the notice is also published online on a website managed by the harbour authority/ the Applicant to allow for public inspection; usually harbour authorities have their own website where this would be done. Although the MMO appreciates that this case is different as the harbour created from this DCO will not be used in the same way as a typical harbour, the development will likely have a website where this could be published. Likewise, for Article 64 (4) and 64 (9), the MMO advises that copies of the byelaws are published online. As a minor point, the MMO also suggests that the periods of time referred to in the Article are defined in a clearer manner such as "within at least 28 days" instead of "at least one month".
- 2.2.19 The MMO notes that Article 65 'General directions to vessels' includes approaches to the harbour and channels leading to harbour. The MMO advises that it may not be appropriate for general directions to be given outside of the harbour jurisdiction.
- 2.2.20 In relation to Article 65 (3) the MMO notes that there is a procedure which has been agreed with the Royal Yachting Association and Chamber of Shipping with regard



3. Deemed Marine Licence (DML) – Schedule 20

3.1 DML Schedule 20 Comments

- 3.1.1 The MMO notes that UXO survey and clearance activities are referenced in relation to works no. 2b, 2d, 2f, 2g, 2h, 2i, 2j, 2k, and 2l, and that that potential for UXO detonations are considered in Volume 2, Chapter 22 of the ES – Marine Ecology. Only a hypothetical scenario has been considered at this stage as little is known about potential UXO finds within the Greater Sizewell Bay. In addition, the draft DCO/DML does not set out the maximum parameters of UXO detonation activities. If the Applicant wishes to undertake UXO works under this DML then a full assessment must be provided within the ES to include UXO detonation or removal, the use of explosives, and the maximum parameters of UXO detonation activities should be clearly defined in the DCO/DML.
- 3.1.2 Additionally, under the United Kingdom (UK) Marine Strategy, all developers are committed to record human activities in UK seas that produce loud, low to medium frequency (10 Hertz -10 Kilohertz) impulsive noise. Consequently, if UXOs are to be removed/detonated under this DML, then a further requirement must be added to refer to UXO detonation to satisfy the UK Marine Noise Registry requirements. Condition 39 should also be amended to refer to UXO detonation to satisfy the UK Marine Noise Registry requirements.
- 3.1.3 The MMO do not consider that any UXO campaign should be authorised through conditions on the DML. UXO campaigns are high risk activities which require detailed, complex impact assessments, conditions and enforcement. It is the MMO's opinion that this activity should be removed from the DML and that it would be more appropriate for the MMO to determine this part of the works, in consultation with relevant stakeholders, through a separate marine licence application.
- 3.1.4 The Applicant will also need to apply to the MMO for a separate European Protected Species (EPS) licence in order to authorise any UXO campaign for the project. Mitigation measures captured within an EPS licence and marine licence for UXO campaigns are usually aligned and this would not be possible under the proposed arrangement. Consequently, a separate marine licence with a set of conditions customised for this activity would be more easily enforceable. Condition complexity is such that a recent marine licence for the UXO campaign at Hornsea 2 Offshore Wind Farm required 19 separate project-specific conditions; the draft DML does not sufficiently secure the required mitigation for this activity. Separating this out from the DML would allow for the UXO campaign to be adequately assessed, conditioned and varied independently without needing to vary the DML should a greater number or magnitude of ordnance be discovered in post-consent survey work than has currently been assessed in the ES.
- 3.1.5 The application documents specify that the soft Coastal Defence Feature (sCDF) and the hCDF are to be positioned landward of the current MHWS. As the MMO's jurisdiction covers the area seaward of MHWS (as defined in Section 42 of the MCAA 2009), it is not appropriate to condition these works on the DML, as such conditions would not be enforceable by the MMO. The MMO advises that any works landward of MHWS must be conditioned elsewhere in the DCO, to be enforced by East Suffolk Council, the relevant LPA in the area. Where there are activities that



will take place in the area that the LPA's and the MMO's jurisdictions overlap, we will work in accordance with the Coastal Concordat to manage enforcement and future licences together. However, the MMO recognises that the MHWS line may change over time and thus it may be appropriate to retain conditions on the DML relating to the coastal defence features so that the MMO can manage the enforcement of conditions for these works should they enter our jurisdiction in the future. We suggest the inclusion of a condition similar to that included within the DML (schedule 13) of the Eggborough Gas Fired Generating Station Order (National Infrastructure Planning 2018);

(4) The undertaker (and any agent, contractor or subcontractor acting on its behalf) may engage in the licensed activities in –

(a) the area bounded by the coordinates set out in Table 12 of this paragraph; and

(b) If there is a change in mean high water springs during the construction, maintenance and operation of the licensed activities, the area bounded by the coordinates set out in table 13 in this paragraph to the extent that they fall below mean high water spring tide at the time the licensed activities are carried out.

3.1.6 The volumes and figures presented in the DCO are not always represented within the ES project description. On numerous occasions, the total figures for cable protection, scour protection and disposal volumes do not match across the ES, the DML and Schedule 1 of the DCO. The MMO requests that these volumes and figures for maximum parameters are provided in a clear table to allow for accurate consideration of the potential impacts of these elements of the proposed development, and requests that this level of clarity is reflected in the maximum parameters set out in the DML.

3.1.7 All references to '*the licence holder*' in the DML should be changed to '*the undertaker*' instead.

3.1.8 In relation to Part 1 'Introduction', the MMO notes that this section would usually have a subheading of 'Interpretation'. This would match Part 1, 'Interpretation' in the main DCO. The MMO recommends that the subheading of 'Interpretation' is inserted into Part 1 of the DML for consistency across the DCO.

3.1.9 The MMO advises that the definition of 'commence' in Part 1, Article 1 (1), 'Introduction' (page 130), should include more detail to clarify exactly which works will be excluded from this definition.

3.1.10 The definition of 'Environmental Statement' in Part 1, Article 1 (1) appears to contain typographical errors. It is currently defined as follows "Environmental Statement" means the document submitted by the undertaker to support its application for development consent and certified as such by the Secretary of State under article 78 and identified in Schedule 23 for the purposes of this Order;'. It appears that the cross-references should be to Article 80 (rather than Article 78) and Schedule 22 (rather than Schedule 23). This should be clarified.

3.1.11 The Applicant's definition of 'maintain' in Part 1, Article 1 (1), 'Introduction', differs to the MMO's definition. The MMO define 'maintain' as 'the upkeep or repair of an



existing structure or asset wholly within its existing three-dimensional boundaries'. The MMO advises that the definition of 'maintain' is altered to include that existing structures or assets can only be maintained 'within its existing three-dimensional boundaries'. Additionally, the definition of 'maintain' in the DML differs to the definition of 'maintain' in Part 1, Article 2 (1) of the DCO. The MMO advises that the Applicant should clarify if there is a reason why the definitions differ.

3.1.12 In Part 2, Article 4 (2)(a) the reference to 'Works no. 1 a(m)' without confirmation that this is the Beach Landing Facility (BLF) can be hard to follow. Including a brief description of the works here would aid the reader and reduce the risk of misunderstanding. For example, Article 4 could be changed to:

'(2) Such activities are authorised in relation to the construction, maintenance and operation of—

(a) Work No. 1a(m) — A Beach Landing Facility comprising—...'

This comment is relevant throughout Article 4 (2).

3.1.13 In relation to Part 2, Article 4 (2)(a)(i) the MMO advises that the term 'approximately' is not accurate enough to be enforceable, and a maximum diameter would be more appropriate. This comment also applies throughout Article 4 (2).

3.1.14 Part 2, Article 4 (2)(b)(ii) regarding the sCDF states, '*Replacement of sacrificial sediments comprising sand and shingle, or by pass, not in exceedance of 120,000m³ per annum;*'. The MMO requests that the Applicant clarifies what is meant by 'or by pass'.

3.1.15 Similarly, in relation to Part 2, Article 4 (2)(b)(iii) the MMO requests clarification from the Applicant on what is meant by 'redistribute'.

3.1.16 In relation to Part 2, Article 4 (2)(d)(i), (2)(f)(i), and (2)(h)(i), the MMO advises that some bored tunnels are not licensable under the 2009 Act. For further details, see



3.1.17 The MMO notes in relation to Part 2, Article 4 (2)(e)(iv) that the Applicant could consider adding Low Velocity Side-Entry to the introduction section.

3.1.18 In Part 2 'Licensed Activities – General' the MMO advises that all works should be able to be cross-referenced with the project description and 'Worst-Case Scenario' in the EIA. Additionally, further details must be provided here to include maximum areas and volumes. For example, there is no volume provided for the disposal of dredged material in Article 4 (2)(e)(iii). Details of the disposal site should also be included.

3.1.19 Part 2, Article 4 (2)(l) relates to the combined drainage outfall tunnel and associated head structure. However, no volumes of anti-scour material around the base of the outfall head is provided. The volumes of anti-scour material should be stated here. Additionally, the MMO requests that the applicant identifies where scour material has been referenced in the ES.

3.1.20 Similarly, all of the following activities in Part 2 include use of anti-scour material but do not include volumes: Article 4 (2)(i) which relates to outfall heads including



vertical shafts, Article 4 (2)(e) which relates to intake heads including vertical shafts, Article 4 (2) (g) which also relates to intake heads and vertical shafts, Article 4 (2)(j) which relates to a fish return tunnel and outfall head, Article 4 (2)(k) which relates to a second fish return tunnel and outfall head. The volumes of anti-scour material should be detailed for all these activities.

- 3.1.21 The MMO notes that there are two Part 3 headings on pages 135 and 136. Part 3 on page 135 is entitled 'Conditions', and Part 3 on page 136 is entitled 'During Construction, Operation, and Maintenance', however what follows are also conditions. The MMO suggests that the second Part 3 heading is not necessary and a subtitle 'During Construction, Operation, and Maintenance' could be inserted above condition 21 instead.
- 3.1.22 In Part 3, all mitigation as outlined within the final EIA should be able to be cross-referenced and linked with a condition.
- 3.1.23 Part 3, Condition 10 states in relation to the programme of works '*...The programme should include:...*' The MMO requests that the Applicant changes this to '*...The programme must include:...*' to make the condition enforceable. This also applies to all other conditions that state 'should include' instead of 'must include'.
- 3.1.24 In relation to Part 3, Condition 10 (a), the MMO suggests that the Applicant should add "as outlined in Part 2" to the end of the section.
- 3.1.25 In relation to Part 3, Condition 11 (1) the MMO notes that the DML requires method statements to be submitted to the MMO 6 weeks prior to the commencement of each licenced activity or each phase of licenced activity. The MMO also notes that there are no timescales stated for the submission of many of the other post consent plans. The MMO does not agree that a 6-week timescale provides sufficient time for the post consent documentation to be considered prior to the commencement of the works. The MMO believes that this timescale is unrealistic as the pre-construction sign-off process is not always straightforward. The MMO appreciates that in many cases the Applicant could be working towards a very tight post-consent time schedule, and a delay in document sign off could lead to project deadlines slipping, significant cost implications and frustration. Consequently, it is crucial to manage the Applicant's expectations and enable forward planning through ensuring that there is enough time allowed for this process. Therefore, the MMO recommends that a more realistic, 6-month timeframe is provided for consideration of post-consent documentation submissions. This will allow for sufficient stakeholder consultation and comment to be provided.
- 3.1.26 A 6-month timeframe for documents to be submitted prior to the commencement of works is recommended because, based on the MMO's extensive DCO-experience, it is very common for the post-consent submissions to require multiple rounds of consultations to address stakeholder concerns. This process alone can be very time-consuming. For example, the time scale of one in-depth plan (such as the Archaeological Written Scheme of Investigation) could potentially follow this path:
- 4 weeks to acknowledge and review the document within the MMO.
 - Up to 6 weeks for external consultation of the documentation.



- Once consultation is closed the MMO must review the response and possibly ask for additional information from the Applicant. At this stage the MMO and the Applicant would be in discussion to agree on an approach to the responses. This could take up to 4 weeks.
- The MMO could then request further information from the Applicant, which dependent on the level of detail, could represent a further significant time period of for example 4-6 further weeks.
- Once this is returned by the Applicant, the MMO may need to begin the consultation process again.

3.1.27 It is noted from the above that, even if discharge documentation were to follow the current timescales, and no further communication was required from the Applicant (which is highly unlikely) the current turnaround equates to 14 weeks. Whilst the MMO always endeavours to process any post-consent documentation as efficiently as possible, allowing the MMO up to 6 months provides sufficient buffer for any additional Applicant and consultee engagement which may be required in order to reach an informed decision, with less risk of delays to the Applicant.

3.1.28 Additionally, in relation to Condition 11 (1) the MMO advises that each method statement must include locations.

3.1.29 In relation to Part 3, Condition 11 (2) the MMO suggests that the Applicant should consider adding the Marine Case Management System (MCMS) to Part 1 'Introduction'.

3.1.30 The MMO notes that Part 3, Condition 12 (2) is not a pre-construction condition and should be moved to the appropriate section of the DML.

3.1.31 In Part 3, it appears there is currently no provision for updated methodologies, final design, or updated plans to be provided. The MMO advises that it is clarified how this will be included and conditioned.

3.1.32 In relation to Part 3, Condition 14, the MMO advises that the wording of the Notice to Mariners condition is updated to reflect the current requirements agreed with Maritime and Coastguard Agency / UK Hydrographic Office:

'Local mariners and fishermen's organisations must be made fully aware of the activity through a local Notice to Mariners. This must be issued at least 5 days before the commencement of the works. The MMO must be sent a copy of the notification within 24 hours of issue.'

3.1.33 In relation to Part 3, Condition 17 (1) the MMO advises that to aid sign-off of the plan it would be useful if the plan could also include:

'... (f) – confidence that the proposed mitigation will be effective.'

3.1.34 In Part 3, Condition 17, the MMO notes that there is no mention of the role of the Marine Technical Forum (MTF) in the delivery of the Monitoring and Mitigation Plan actions. This group was set up with a constitution designed to oversee the Monitoring and Mitigation Plan through the construction and operation phases. The MMO therefore recommends that its role is referenced in the DCO in a similar fashion to the ES.



- 3.1.35 In relation to Part 3, Conditions 17, 18, 19 and 20 (1), the MMO request that the Applicant adds a timeframe of when these documents will be submitted to the MMO for approval considering the approval timeframes discussed in paragraph 3.1.25.
- 3.1.36 The MMO advises that Part 3, Condition 20 (1) should be amended to state that the plan will be approved by the MMO in consultation with the appropriate Inshore Fisheries and Conservation Authority (IFCA). If the applicant does amend the wording of this condition then IFCA should also be added to Part 1, 'Introduction'.
- 3.1.37 In relation to Part 3, Condition 24 (3) a 10-minute cessation period should be stated. The MMO requests that the Applicant changes this.
- 3.1.38 The MMO advises that a number of changes are made to the wording of Part 3, Condition 33. The condition should be amended to '*local*' MMO office from '*district*' MMO office. This will align with the description in Part 1, Article 2 'Addresses'. The condition should state that '*the undertaker must endeavour to locate the material and recover or move it to a location where it poses no risk to navigation*'. Additionally, the condition should state that the undertaker must demonstrate to the MMO that they have made suitable attempts to locate, recover or move the material should they not be able to do so. Finally, the MMO would like to see the reporting time of such an incident reduced from 48 hours to 24 hours. This is in-line with the MMO dropped objects reporting timeframe.
- 3.1.39 The MMO requests that Condition 34 is amended to say that the Maintenance Activities Plan must be submitted to the MMO '*for approval*'.
- 3.1.40 In relation to Part 3, Condition 35 the DML notes that there are requirements for dredging at the BLF (1a(m)), the drilling of the tunnel (2k and 2l), the intake heads and vertical shafts (2b and 2d), the outfall heads (2f) and the FRR (2g, 2h, 2i and 2j). The ES (Volume 2, Chapter 3, p.3.4.122) gives a total volume of 110,000m³ which we assume is the capital dredge for the activities listed above. There does not appear to be any reference to volumes for navigational/maintenance dredge or pre-dredge silt removal requirements. Some consideration should also be given to requirements for initial silt removal which may be needed prior to any capital dredge. If volumes of navigational dredging / silt removal are not provided within requirement number 36 (with supporting assessment linked back to the ES) then a separate marine licence may be required for that activity. As that requirement would be directly linked to the construction of the plant, then it would likely fall under EIA regulations.
- 3.1.41 Also, in relation to Condition 35, the MMO requests that the wording of this condition is amended to include the requirement for the depth of material that will be dredged to be provided. For example, Condition 35 (d) could be amended to '*volume and depth of material to be dredged*'.
- 3.1.42 In relation to Part 3, Condition 36, the MMO requests that additional details are included in the requirements for this condition. The MMO proposes that the condition is amended to:

36.—(1) For Work Nos. 1A(m), 2K and 2L, 2B, 2D, 2F, 2G and 2H, and 2I and 2J, no dredging or disposal activity shall commence pursuant to the relevant Work No. until a sample plan and sediment sample



analysis request for that Work No. has been submitted to, and approved by, the MMO. The plan must include:

- (a) Name of the area to be dredged;*
- (b) Name of the disposal site;*
- (c) Details of the material type proposed for deposition dredge and disposal;*
- (d) Volume of the material proposed for dredge and disposal;*
- (e) Dredging methodology (including dredge depth and proposed programme for the dredge and disposal activities)*
- (f) The location and depth of any supporting samples and*
- (g) Analysis results which shall not exceed 3 years in age.*

- 3.1.43 The MMO notes that the Applicant is seeking to have a new disposal site designated within the footprint of Sizewell C NNB, and the Applicant has submitted a site characterisation report for the proposed new disposal site. The MMO advises that PINS must consult with all stakeholders who could have an interest in the designation of a new disposal site in this area. It will be necessary to consult the owner of the seabed where the new disposal site is to be designated. This will likely be The Crown Estate, which owns the sea bed up to the 200-mile limit of UK territorial waters. Consultation should also include relevant local interests, user groups and marine protection organisations. The MMO will aim to provide specific comments on the disposal site characterisation report in our future responses.
- 3.1.44 In relation to Part 3, Conditions 35, 36, 40-45, 47, 48, and 50, the Applicant should include a timeframe of when documents will be submitted to the MMO. As detailed above, the MMO recommends that this should be 6 months prior to the commencement of works. This is particularly relevant for the *Sabellaria spinulosa* Monitoring Plan that will be submitted under Condition 45 because it relates to a sensitive and protected feature.
- 3.1.45 In relation to Part 3, Condition 37 (2), the MMO advises that ‘OSPAR’ is included in DML Part 1, ‘Introduction’.
- 3.1.46 Notwithstanding our advice in the above paragraphs 3.1.3 and 3.1.4 that UXO works should be removed from the DML, if UXO works are to remain within the DML then Part 3, Condition 39 may need to include the requirement for a Site Integrity Plan for the Southern North Sea Special Area of Conservation (SAC) to be submitted to the MMO.
- 3.1.47 Additionally, in Condition 39 it is not clear if UXO detonation will only be undertaken during construction, or if this be continued during maintenance and operation. The MMO advises that it is specified when UXO detonation will take place.
- 3.1.48 The MMO advises that Part 3, Conditions 40 (1), 41(1), and 42 (1), relating to the BLF, sCDF, and hCDF, should be amended to state that the works will not commence until the activity details have been submitted to and approved by the MMO *‘in consultation with East Suffolk Council’*. For example, Condition 40 (1) should be amended to:



'Beach Landing Facility

40.—(1) Development of Work No. 1A(m) shall not commence until the following activity details have been submitted to and approved by the MMO in consultation with East Suffolk Council...

- 3.1.49 The MMO advises that in Part 3, Condition 40, the requirement to provide a noise risk assessment should be included due to the option of percussive piling. Any mitigation that is provided to minimise impacts to protected species which is not already captured in the HRA/a separate provision in the DML, should also be included here.
- 3.1.50 There appears to be a typographical error at Part 3, Condition 41 (2) (soft Coastal Defence Feature). We consider that the cross reference to Work No. 1a(o) should instead be to Work No. 1a(n), for consistency with Part 3, Condition 41 (1).
- 3.1.51 The MMO notes that Work No. 1a (o) relates to the construction of the hCDF. However, no volumes or dimensions of rock protection are provided in the DML, and nor is it referenced in the ES, Vol 2, Chapter 3. The MMO notes that maximum requirements must be detailed in the DML. Additionally, it appears that the reference in Part 3 Condition 42 (2) to Work No. 1a (t) is a typographical error and should refer to Work No. 1a(o), for consistency with Part 3, Condition 42 (1).
- 3.1.52 Part 3, Conditions 40-50 all list specific details that must be provided to the MMO in relation to the conditions. All of these conditions should be amended to state the *'details must include but are not limited to: ...'* and they should all include a provision for *'any other reasonable details the MMO deem are required'*. For example, Condition 42 (1) should be amended to:

'42.—(1) Development of Work No. 1A(o) shall not commence until the following activity details have been submitted to and approved by the MMO. The details must include but are not limited to:

- (a) start and end dates for the installation*
- (b) installation methodology and detailed method statement,*
- (c) vehicles and plant to be used,*
- (d) any other reasonable details the MMO deem are required.'*

- 3.1.53 Part 3, Conditions 40-44, 47 and 48, all list the details that must be provided to the MMO about the different activities referred to in each condition. These conditions should be amended to include 'impacts to receptors' as an additional detail that must be provided. For example, Condition 40 (1) should be amended to:

'40.—(1) Development of Work No. 1A(m) shall not commence until the following activity details have been submitted to and approved by the MMO. The details must include but are not limited to:

- (a) start and end dates for the installation*
- (b) installation methodology and detailed method statement,*
- (c) navigational lighting to be used on plant,*



- (d) vessels to be used,*
- (e) impacts to receptors, and*
- (f) any other reasonable details the MMO deem are required.'*

3.1.54 Part 3, Conditions 40-44 should also include 'links to the coastal processes monitoring and mitigation plan' as an additional detail that must be provided. For example, Condition 41 (1) should be amended to:

'41.—(1) Development of Work No. 1A(n) shall not commence until the following activity details have been submitted to and approved by the MMO. The details must include but are not limited to:

- (a) start and end dates for the installation*
- (b) installation methodology and detailed method statement,*
- (c) vehicles and plant to be used,*
- (d) impacts to receptors,*
- (e) links to the coastal processes monitoring and mitigation plan, and*
- (f) any other reasonable details the MMO deem are required.'*

3.1.55 Additionally, in Part 3, there are no mitigation requirements for Conditions 41, 42, 44, 45, and 47. The MMO advises that this should be included for these conditions.

3.1.56 The MMO understand that East Suffolk Council have comments regarding information that should also be included in conditions 41 – 43. Assuming that there are no conflicts, the MMO welcome that the recommendations from both of our organisations are included in these conditions.

3.1.57 Part 3, Condition 45 appears to have a typographical error in the first line as it says 'untilo' where it should say 'until'.

3.1.58 In relation to Part 3, Condition 45, the MMO requests that the Applicant adds '(3) demonstration of how the project design reduces the loss of reef, and surrounding area available for reef to develop into, as far as practicable' as part of the details that must be provided within the Sabellaria Monitoring Plan.

3.1.59 In relation to Part 3, Condition 50 (b) the MMO would also need an analysis of the confidence of the additional adaptive measures. We therefore request the Applicant amends this Condition to include this. There is also a typographical error here as 'Unit 2' has been missed off at the end.

3.1.60 In relation to Part 4, Tables 6 and 7, 'FRR' should be included in Part 1, 'Introduction'.



4. Other Application Documents

4.1 General Comments

4.1.1 The MMO note that detailed monitoring plans will need to be produced for each project element and submitted to the MMO for approval. At this stage detail is lacking throughout.

4.2 Coastal Processes Monitoring and Mitigation Plan (BEEMS TR523)

4.2.1 The MMO advise that any coastal monitoring plan should also be included as a requirement. This is because for any works landward of MHWS, East Suffolk Council will be the enforcement body; any monitoring that relates to the sCHF and hCDF will be of relevance to the council.

4.2.2 The plan restates the impact assessments that are included in the relevant ES chapter. The MMO understands that the level of monitoring relates to the scale of impact, however the scale of predicted impact is not fully agreed at this stage as, unavoidably in the marine environment, some uncertainties remain. The MMO advises that monitoring options to address these uncertainties should be included. This is most relevant to the monitoring of the BLF.

4.2.3 The MMO notes that the plan presents a monitoring strategy, and the available methodologies, with a broad description of how each will be applied to a project element. The MMO advises that more detailed monitoring plans must be agreed for each project element and method.

4.2.4 The MMO notes that there is no monitoring of the change to sub-tidal bed substrate included in the plan. This must be included here. Alternatively, if this is considered within benthic ecology section, this should be referenced here.

4.2.5 The plan states that the overall bathymetry of the banks will be surveyed within the background monitoring programme – i.e. once every 5 years. It is the MMO's view that 5 years would be too long to alert the project to any unexpected changes which can occur in a dynamic marine environment, at least during the early years of the construction programme.

4.2.6 The report is heavy with abbreviations which are not all expanded. A listing of all abbreviations and particular technical terms (e.g. "white ribbon") should be included.

4.2.7 Within section 2.1 the choice of final terrestrial monitoring approach is not made. The MMO advises that it would be useful to describe the criteria for the final choice here.

4.2.8 Additionally, in relation to section 2.1, the MMO notes that the focus of the X-band radar is on the positions of the bar crests and shoreline. The MMO advises that evidence for the height, width and slopes of the bars should come from echo sounding.

4.2.9 The MMO advises that section 2.2.1 should include an explanation of how the proposed approach is better than LiDAR – either terrestrial based or via Remote Piloted Aircraft (RPA) with similar Real-time Kinematic-Global Positioning System (RTK-GPS) positioning.



- 4.2.10 The MMO advises that section 2.2.2 should include a view on the target accuracies, horizontal and vertical, and hence a view on the uncertainty in the observed beach volume. In particular, this should include how vegetation is taken account of.
- 4.2.11 Additionally, in relation to section 2.2.2, the MMO agrees that this method does allow very high resolution. However, the resolution that is being considered for the monitoring should be stated here. It should also be clarified if the data will be averaged onto a grid, or some other method of analysis.
- 4.2.12 In section 2.3, both multi beam and single beam echo sounding are mentioned. The MMO seeks clarity on which will be used where and why. Additionally, a view on the target accuracies, horizontal and vertical, is again needed.
- 4.2.13 In relation to section 2.5 and the baseline monitoring, the MMO advises that there is a strong advantage to, where possible, continuing the data collection that has been undertaken since 2008. It is not clear if these datasets will provide the baseline against which the monitoring will be based, or if the proposed methods will be undertaken for a sufficient period before the start of construction to provide the baseline dataset. This should be clarified.
- 4.2.14 It would be useful for section 3.3 to include an illustration of the proposed monitoring area and the anticipated area of scour.
- 4.2.15 Additionally, in relation to section 3.3, the MMO is concerned that if all jack-up barges operating do not put their spud legs down within 100m of the offshore cooling water infrastructure, their effect will not be captured within the monitoring. The MMO advises that confirmation should be provided that all spud legs will be placed within 100m of the structures, and if not, the monitoring survey area should be increased to cover this.
- 4.2.16 The MMO advises that the assumption within section 3.3 that the scour around the offshore cooling water infrastructure will reach equilibrium in 3 months is subject to uncertainty. If the 6-month survey shows scour development continuing (in depth or extent), then further surveys will be needed until the equilibrium is reached – or mitigation measures are put in place (see next comment).
- 4.2.17 Although the potential for scour protection is mentioned in section 3.3, there is no mention of the approach to monitoring its effectiveness. The MMO advises that this monitoring would most likely require a pre-installation survey, post-installation survey and follow up survey(s) to show scour has been curtailed.
- 4.2.18 Additionally, in relation to section 3.3 (as well as section 4.3), the MMO advises that it would be standard practice to grid the multibeam echo sounder (MBES) data to enable analysis. The resolution grid that will be used should be detailed in these two sections.
- 4.2.19 It would be useful for section 4.3 to include an illustration of the proposed monitoring area for the nearshore outfalls and the anticipated area of scour. Seeing how the predicted scour relates to the observed changes at Sizewell B (SZB) would also be useful.
- 4.2.20 Within section 4.3, it is not clear how the total extent of the monitoring is 1800m if it extends 500m north and 100 m south. This should be clarified.



- 4.2.21 The monitoring detailed in section 4.3 is designed to cover the uncertainty in response of the bar. There should be a presentation of the baseline against which the monitoring will be measured as well as consideration of the approach to thresholds of change (including natural variability) within which the predicted lack of change can be confirmed. Conversely, a conceptual mitigation plan could be considered.
- 4.2.22 In relation to section 4.3, the MMO seeks clarity on whether scour protection will be used for the nearshore outfalls.
- 4.2.23 In relation to section 4.3, the MMO notes that the inner bar will be surveyed, if possible. The MMO seeks clarity on whether it has been confirmed that the proposed Autonomous Survey Vessels (ASVs) cannot be used here in the shallow water areas.
- 4.2.24 Additionally, in relation to section 4.3, the gap in data coverage between the aerial and marine surveying – the white ribbon – is a key parameter in judging the survey quality. The MMO advises that there should be a target coverage for the combined survey methods.
- 4.2.25 A view on the target accuracies, horizontal and vertical, is again needed for section 4.3; in particular, when considering combining the proposed aerial and marine survey data.
- 4.2.26 Our comments above on section 4.3 on accuracy and grids etc., also apply to section 5.3.
- 4.2.27 In relation to the BLF and section 5.3, the MMO is not convinced that there will be no impacts from the BLF piles and dredging (see our comments 5.2.8 and 5.2.9 below). As the monitoring is designed to cover these uncertainties there should be a presentation of the baseline against which the monitoring will be measured, and consideration of the approach to thresholds of change (including natural variability) within which the predicted lack of change can be confirmed. Conversely a conceptual mitigation plan should be considered should change occur, for example, if the material dredge to the side of the BLF berth doesn't disperse.
- 4.2.28 Additionally, a view on the target accuracies, horizontal and vertical, is needed for section 5.3.
- 4.2.29 It would be useful for section 5.3 to include an illustration of the proposed monitoring area around the BLF and the anticipated area of scour, indicating the limit of predicted effects and the relevant bed contours.

5. Environmental Statement (ES): Volume 2 – Main Development Site

5.1 Chapter 20 – Coastal Geomorphology and Hydrodynamics



- 5.1.1 Paragraph (P.) 20.3.5 states that thermal plumes have not been assessed because there is no pathway to impact upon geomorphic receptors. The MMO agree that the thermal difference from the outfall is unlikely to alter the geomorphology, however the rising plume from the outfall may influence the hydrodynamics before mixing, and hence may have an effect on sediment transport. Due to mixing and the relative magnitude of the outfall flow and the passing coastal flow, any pathway to effect is likely to be small, however it is present and should be considered here.
- 5.1.2 In relation to the study area in p.20.3.9, the MMO agrees that the use of MHWS as an upper limit for the impact assessment is reasonable. However, it should be noted that MHWS is based on the average of the highest water reached during a spring neap cycle. As such, higher tidal water levels will occur regularly as well as higher water levels due to non-tidal forcing. The nett drift averaged over a 10-year period, being towards SZC at Thorpeness and north of Sizewell does not imply automatically that there cannot be any impact of SZC outside the sub cell.
- 5.1.3 P.20.3.21 states that the final detailed designs are not yet available and that assumptions are to assess the likely worst-case impacts. This is an important note to remember in reviewing the predicted effects.
- 5.1.4 In relation to p.20.4.6, the historic change in predominantly North East (NE) waves to a bimodal situation during the 19th Century and up to 1925 is noted. In our previous comments (dated 01/11/2019) the MMO asked why the impact of the “19th Century” wave climate resuming has not been assessed. This has still not been considered as the present situation of little coastal change (and hence little impact) depends on the present wave regime continuing. The MMO advises that any future assessment should consider the risks of the system reverting to the NE wave dominated scenario of the early 20th Century when high rates of erosion and accretion occurred.
- 5.1.5 The MMO notes that p.20.4.31 states suspended sediment concentrations (SSC) ‘regularly peaks at low water slack’. We presume that this is from near bed SSC observations, hence the comment on settling, however this should be made clear.
- 5.1.6 In relation to p.20.4.65, the MMO notes that there is some evidence for a link to the North Atlantic Oscillation (Blanco and Brampton, 2017). As described above, the risk that the wave climate at Sizewell reverts to the pre-1925 case should be considered. Such a change could significantly alter the sediment supply and coastline behaviour.
- 5.1.7 In relation to p.20.4.77 on the future shoreline baseline geomorphic elements, it is assumed that the future baseline will resemble the present day. As mentioned above, the lack of assessment of changes to the offshore wave climate to a NE domination is a gap in the analysis. For the nearshore climate, it assumes the bank system is stable. However, the northern end of Dunwich bank has lowered 2 metres in the past 10 years; the most logical assumption would be for this trend to continue. This will affect the nearshore wave climate and should be included.
- 5.1.8 In relation to p.20.8.14, and p.20.8.29 the MMO advises that the presence of the piles may lead to some salient at the jetty location or just down drift of it. Although this is unlikely to be large, it may have some effect on the littoral drift and should be considered.



- 5.1.9 In relation to p.20.8.22, the MMO advises that based on the infill rates predicted, the proposed maintenance dredging for barge access will include a capital dredge in advance of the period of operation (April to October), in addition to dredging for 2-3 days per month over the usage period. We are concerned that slope degradation, as is typical following a dredge, may result in more maintenance than is assessed. Within this slope degradation, sediment may slump from the inner longshore bar as the dredged area intercepts it. Continued maintenance of this area could degrade the inner longshore bar. Assuming this dredging is all done by plough dredging, some of the coarser sediment will remain where it is ploughed to, resulting in a bed feature with potential to alter the near shore wave conditions or be dispersed with a portion of it remaining in the local area. Neither of these cases has been assessed in terms of geomorphic impacts.
- 5.1.10 The MMO notes that for p.20.12.15, some dredging will be required. During these periods of dredging, bathymetric monitoring is required for the berth pocket, the area where the sediment is ploughed to and the inner longshore bar. This monitoring will cover the uncertainties described in p.20.8.22. The MMO notes that there is no mitigation proposed for navigational dredging at the BLF. Please see our comments on the Coastal Processes Monitoring and Mitigation Plan in section 4.2 of this letter.
- 5.1.11 The MMO advises that Table 20.6 should be updated to include monitoring that relates to the navigational dredging in the berth pocket, in the area where the sediment is ploughed to, and over the inner longshore bar. Additionally, the tabulated techniques are not consistent with the Coastal Processes Monitoring and Mitigation Plan.
- 5.1.12 The MMO advises that Table 20.8 should include loss or change to the substrate in the areas of navigational dredging.
- 5.1.13 In relation to section 20.14, the MMO refers you to our comments above on the risk of a change in wave climate over the lifetime of the station (see paragraph 5.1.4).
- 5.1.14 In general, despite the littoral drift to the south, the mitigation ignores potential impacts to the south of SZC. While the MMO recognises that the assessment concentrates on the stretch of the coast to the north of the site because that is a particularly sensitive area, the less sensitive parts to the south should be further considered. This comment applies in general to this whole chapter, although the sensitivity assessment for changes to sediment supply in section 20.14 is welcomed, in particular the sensitivity to a lowered Dunwich Bank.

5.2 Chapter 21 – Marine Water Quality and Sediments

- 5.2.1 P. 21.3.81 refers to ‘combined sources or ammonia’, however it is not clear what is meant by combined sources. This should be clarified.
- 5.2.2 Further clarity is welcome on the models listed in p.21.3.89. For example, it would be useful to have the release version of CORMIX stated here as well as similar information on the provenance of the General Estuarine Transport Model (GETM).
- 5.2.3 P.21.4.26 on 2014/15 water sampling states that Tables 21.10 and 21.11 show data in ‘averages and ranges’, however only the averages are provided in these tables.



- 5.2.4 It is noted that p.21.4.29 summarises survey data for metals and polycyclic aromatic hydrocarbons (PAHs). Since metal data is already shown in Table 21.10, it is not clear why there is no similar table for PAHs.
- 5.2.5 In p.21.6.37, ammonia is said to be ‘rapidly used’ in the marine environment. The word ‘rapidly’ should be defined in the context of likely impacts.
- 5.2.6 P.21.6.70 on acute and chronic Predicted No Effect Concentration (PNEC) for hydrazine does not provide justification for the values used. This paragraph should either provide more explanation of the values or reference the related synthesis report where this can be found. This is important as the basis of the assessment of the impact of hydrazine is made on the choice of these PNECs.
- 5.2.7 In p.21.6.121 the method to derive the 98th percentiles is not described. It is implied that these are generated directly from the GETM model. However, in the synthesis report (and associated feeder reports), it is clear that the 98th percentile is derived by adding the mean monthly uplift due to the plants to the 98th historical seasonal variation. This methodology should be stated clearly in the ES, along with the reason for its use (i.e. the GETM model over predicts peak temperatures). The approach may be precautionary, but the shortcomings of the modelling should be stated here.
- 5.2.8 P.21.6.137 explains the method used to estimate future peak (98 percentile) sea temperatures. This involves adding the 98th percentile monthly uplift and the 98th percentile historical monthly variation to the mean monthly predicted uplift due to the cooling water streams. Whilst this is stated to be precautionary, no reference is given to justify this.
- 5.2.9 In relation to p.21.6.173 on acute and chronic PNEC for hydrazine – we have the same comment as stated above in paragraph 5.2.6.

5.3 Appendix 21E - Marine Water and Sediment Quality Synthesis (MSR2/6); BEEMS Technical Report TR306 Edition 5.

- 5.3.1 In section 4.3.1 there is a narrative description of the expected sediment footprints from the dredging associated with the installation of the cooling water intake and heads. Comments are made that the peak concentrations could be more than 2000 milligrams per litre (mg/l), but are short lived. However, there is no description of how these findings were determined, no details of the modelling, and no graphical or tabular results. In this section, it is implied that the sediment plumes and associated deposition do not result in significant impact, however it is difficult to determine the basis of the findings based on the evidence presented in this report. The MMO advises that further information is provided.
- 5.3.2 The mixing zone definition in section 1.2.2 is specified based on the 2010 guidance. This definition does not state a specific extent, rather the zone is defined as what is acceptable in terms of site-specific impacts. It is not clear how this mixing zone approach is applied in this study. It also makes it difficult to determine whether the extent of the footprints presented later are significant or not. Clarifying the appropriateness of this definition is possibly outside the remit of the synthesis report, but it would be useful to clarify how mixing zone criteria have or will be interpreted in the ES.



- 5.3.3 In section 7.1 the 98th percentile temperature values have been derived by adding the mean predicted temperature uplift to the observed 98th percentile temperature. This is because the GETM model tends to over-predict the absolute temperature. However, no discussion is presented as to why the GETM model over-predicts or if any sensitivity tests have been carried out to determine the key sources of the over-prediction. Equally there is no discussion as to whether the over-prediction of the baseline temperature has any influence on the predicted uplift. No justification is given to show that adding mean predicted uplift to the 98th observed value is a valid or reliable representation of the future 98th percentile absolute value. The MMO would expect to see a statement that a sensitivity analysis had been carried out to assess the impact of the assumption, with a reference to the relevant feeder report.
- 5.3.4 In section 7.1.3 potential thermal barriers to fish migration are discussed. The reference to the BEEMS standard for thermal barriers in an estuary is referred to several times in the report, however it is the MMO's view that this is not applicable at the site which is coastal water. Consequently, no analysis has yet been done on thermal barrier as no appropriate assessment method has been defined for coastal waters. It is stated that an analysis will be presented in TR483. This should be included in a revised synthesis report.
- 5.3.5 In section 5.4.1 there is no discussion about the selection of the locations of the outfall and intakes. In reviewing the sections on the operational impacts, it would have been useful to know whether the outfall and intake layout used in the assessments has already been optimised to minimise the environmental impact.
- 5.3.6 Additionally, in section 5.4.1 the CORMIX expert system was used as part of the screening assessment of the discharges from the Combined Drainage Outfall (CDO) to be operated during the construction phase. As the CORMIX analysis is dependent on the geometry of the outfall diffuser or discharge point, the assumption about the CDO design should have been presented. In the same section, it is implied that the GETM far-field model has dedicated model variables for Zinc and Chromium. It is likely that a conservative arbitrary tracer was used, the results for which were then scaled based on the Zinc and Chromium discharge concentration, however this should be made clearer.
- 5.3.7 Section 5.5.1 on the discharge of ammonia from the CDO, states that 'it is evident from the derived data that there is exceedance of [Environmental Quality Standards] ...'. However, it is the MMO's view that it is not evident to the reader as the observed data are not presented. Additionally, the same section refers to mixing figures to determine the ratio of unionised to ionised ammonia. This is not explained sufficiently to understand what e.g. 96% mixing means.
- 5.3.8 The MMO advises that it would be useful to include in section 7.3.4 a reference to the relevant feeder report on the derivation of PNEC values for hydrazine.

5.4 Chapter 22 – Marine Ecology and Fisheries

5.4.1 Major comments



- 5.4.1.1 Overall, the MMO consider that the marine ecology topic assessment is generally thorough and robust. The MMO note that the fish impingement and entrainment assessments follow similar methods used in the assessment for Hinkley Point C Nuclear Power Station (HPC). There is likely to be a need for further discussion on the approach to estimating EAVs and stock areas. The MMO is comfortable with the approach EDF has taken in relation to EAVs and stock areas.
- 5.4.1.2 More evidence will be required to justify the assumptions on the beneficial effect of the LVSE design in the absence of an AFD system. It is likely that further discussions will be required concerning the design and operation of the FRR system, including monitoring of impingement and FRR survivability. As with HPC, it will be possible to make agreement on these matters a condition of the DCO/DML.
- 5.4.1.3 In relation to EAVs, the extended method which takes account of repeat spawning potential (in contrast to the Applicant's 'core method') inevitably yields higher EAVs for long-lived species such as bass or cod (in the case of bass, estimated to be by a factor of 3 to 5). However, the extended method does not take account of fishing mortality. Indicative modelling suggests that this may reduce the extended method EAV for bass by a factor of up to 2, although this is uncertain due to the many assumptions that have to be made in generating an estimate.
- 5.4.1.4 Conceptually these two methods differ in their age end-point selected for the calculation. The core method equates losses to the number of adult first-time spawners. In contrast the extension method carries losses to the maximum natural life span and consequently would include multiple spawning events.
- 5.4.1.5 The MMO consider there is no single best method for calculating EAVs in general. While regulators are required to adopt a precautionary approach, care needs to be taken to avoid an over-precautionary approach. The choice of method should be proportionate to the environmental risk and take account of the species likely to be affected. More complex methods may be necessary where simpler methods indicate there is a significant risk. In the context of SZC, entrainment estimates in the draft ES are all generally well below 0.1% of spawning stock biomass (SSB). While a higher estimate was obtained for gobies these are short-lived species and an extended method would not be appropriate for this species.
- 5.4.1.6 On its own, uncertainty concerning the 'best' EAV method to use would not be a reason for requiring additional effort to be expended on the extended method. If there are significant concerns about other elements of the assessment (effectiveness of LVSE in absence of AFD, scale of assessment area) it might be appropriate to suggest to the Applicant to apply the extended method, although once these analyses are completed, decision-making will still require a judgement to be made taking account of the model outputs, analogue evidence from Sizewell B monitoring, proportionality and an appropriate level of precaution.



- 5.4.1.7 The extended method potentially offers a benefit over the core method as it takes account of repeated spawning by long-lived species. However, the extended method makes additional assumptions which may introduce further unquantified uncertainties in the assessment. In particular, it doesn't take account of fisheries mortality. The core method is a simpler method to apply which is likely to yield slightly lower EAVs for long-lived species. The MMO conclude that both models will be incorrect. The extended method will yield higher EAVs for long-lived species compared to the core method but also has greater uncertainty associated with it.
- 5.4.1.8 The extension method goes beyond the core method by allowing mature fish that are discounted in the core method after spawning to age with their cohort annually, to be subject natural mortality and to contribute to lost EAV again. The extension method is the more precautionary of the two methods, although both assessments are considered precautionary. Recall that the population being modelled is assumed stable and that a lifetimes spawning is on average required for stability. However precautionary, and representative of reality are not the same thing. Which method is likely the most accurate in the real world depends on the local context. For a species subject to high fishing mortality with little probability of reaching a natural lifespan, the core method can be more representative. For a species likely to live out its lifespan, the extension method is likely more representative. Thus, the approach could be species specific. The challenge in either case is the assumption of a stable state is weak. Populations allowing only one spawning event may well be overfished lacking the extended age structures that provide resilience and dampen impacts of years of poor recruitment. Populations subject to only natural mortality from the historically low stock levels currently seen are likely to increase unless subject to other constraints.
- 5.4.1.9 If $EAV > 1$ occurs frequently, this suggests that the extension method is not a suitable representation of the context (either because of issues related to a growing population or because of the interpretation of spawning events) and more complex modelling would be necessary for example, an approach that allows density dependent natural mortality on a population as completion for food or disease transmission become more prevalent. $EAVs > 1$ are not an issue for the core method because the endpoint precludes repeat spawning.
- 5.4.1.10 Based on the evidence in the draft ES, the MMO do not currently see a justification for application of the extended method as predicted impacts are all small and generally less than 0.1% SSB. If other areas of uncertainty within the assessment are considered significant (scale of assessment area, effectiveness of LVSE intakes in absence of AFD etc) then this might need to be revisited.
- 5.4.1.11 The models to assess fish entrapment comprise many elements each of which contains estimates and assumptions which are uncertain. Adopting an over-precautionary approach at each stage will inevitably lead to overestimation of impacts by one or two orders of magnitude. The outputs from such models are therefore not particularly helpful for decision-making even though they may represent 'best available' science.



- 5.4.1.12 We would highlight that it is notable that other key uncertainties are not addressed such as the impact of density dependent mortality increasing survival rates of fish that avoid entrapment, or the extent to which e.g. bass distributions might change following decommissioning of SZB and operation of SZC. It is therefore important that assessment requirements remain proportionate and that weight is given to analogue evidence from the operation of existing once-through cooling plant.
- 5.4.1.13 In relation to the scale of assessment, the MMO notes that the Applicant's advisor Cefas continue to justify the use of ICES stock areas as using the best available evidence. The MMO conclude that the use of ICES stock areas for commercial fish species represents the current best scientific evidence available. There is currently no robust information that would support use of more local stock areas in the assessment. The percentage impact on a stock increases in proportion to the decrease in stock area/size used (the stock area/size is the denominator in the impact calculation). Thus, a ten-fold reduction in the stock area/size used results in a 10-fold increase in estimate impact.
- 5.4.1.14 Section 7.8 of Appendix 22I to the Marine Ecology and Fisheries chapter of the ES provides some further reassurance that impacts are not significant, although it is subject to the same potential limitations relating to the various elements of the entrapment assessment.
- 5.4.1.15 Therefore, based on current evidence, the MMO consider that the scale of assessment areas and the method adopted to estimating EAVs is appropriate and proportionate, pending clarification on other uncertainties in the entrapment assessment (e.g. beneficial impact of LVSE system in absence of AFD).
- 5.4.1.16 Should assessment of the final intake design result in significant (order of magnitude) increases in current estimates of entrapment, then it may be appropriate to consider applying the 'extended method' for estimating EAVs for long-lived species such as bass and cod.
- 5.4.1.17 The MMO consider the core method is the better in that the end-point age is more likely to be reflective of reality in the context of currently fished seas, and because the MMO consider the extension method, while very precautionary, has conceptual challenges for $EAV > 1$ and problems for comparing to SSB. The MMO is comfortable that all due efforts have been made to secure data at an appropriate scale.

5.4.2 Minor comments

- 5.4.2.1 All of our comments below on the plankton impact assessment and the benthic ecology assessment are minor.
- 5.4.2.2 The fish noise assessment is considered sufficiently comprehensive and satisfactory although it would have been helpful for the assessment to estimate the relative temporal exposure of fish within the various impact zones. This would have provided additional context for the worst-case scenario that has been assessed. However, it is noted that this would not have altered the conclusions of the assessment.



- 5.4.2.3 The marine mammal noise assessment is considered comprehensive and adequate. However, within the marine mammal assessment there are some minor evidence gaps relating to the toxicity of chemicals used in the construction and operation of SZC to marine mammals.
- 5.4.2.4 The indirect effects and food webs assessment omits entrainment as a pressure. Given that the plankton assessment indicates that entrainment could have a minor impact on primary production within the Greater Sizewell Bay (GSB), the MMO consider that this impact should be assessed here.
- 5.4.2.5 For the commercial and recreational fisheries assessment, it is not stated whether the hCDF will restrict access during construction. The MMO advises that this should be clarified. Additional clarification of mitigation measures should also be provided.
- 5.4.2.6 The mitigation and monitoring section of the chapter is mostly adequate, although would benefit from a thorough quality review to include missing impact pathways, text and inconsistencies with the other sections of the chapter.
- 5.4.2.7 In relation to p.22.3.92, the MMO seek clarity on why the option to run 2 pumps discharging at a higher temperature is not preferred if this results in a lower level of impact compared to running 4 pumps discharging at a lower temperature. Such a mitigation measure would also halve the level of fish entrapment. The MMO presume that it is not considered to be safe to operate in this way for long periods, but this should be clarified.
- 5.4.2.8 In relation to p.22.5.12 and 22.12.14, the MMO advise that for the final Marine Mammal Mitigation Protocol (MMMP) the guidance from the Joint Nature Conservation Committee (JNCC) (2020) and N. D. Merchant and S. P. Robinson (2020) should be considered. See this guidance listed in our references.
- 5.4.2.9 P.22.4.53 of this chapter and Appendix 22D (page 9) state that there are 88 species of finfish recorded, however the MMO notes that Appendix 22I (TR406) states 91 species of finfish were recorded (page 17, section 2 'Background'). This should be clarified.
- 5.4.2.10 P.22.6.124 states that 'To envelope alternative tunnelling methods, assessments considered the use of indicative ground conditioning TBM chemicals.' The MMO advises that there a DCO/DML condition is added requiring specific authorisation of tunnelling chemicals to be used. This would manage the uncertainty as the subsequent assessments of impacts to fish are all predicated on the use of the same chemicals that are proposed for use at other consented NNB projects. This is also relevant to p.22.8.331 which states 'The use of TBM surfactants in the tunnelling process remains to be confirmed and assessments present a precautionary approach enveloping worst-case representative chemicals'. Furthermore, this is relevant to p.22.9.142 regarding the assessments of impacts to marine mammals which are also predicted on the use of the same chemicals that are proposed for use at consented NNB projects.



- 5.4.2.11 In p.22.6.234 the MMO notes that it is unclear whether there are actual differences in mysid density between locations of intakes for SZB or SZC. Appendix 22G (page 9) notes that the difference may be due to sampling; 'This is possibly due to differences in efficiency of sampling gears; species such as mysids can avoid sampling gear with small apertures.'
- 5.4.2.12 The MMO assumes that p.22.6.372 should say Appendix 21F instead of 22F, p. 22.8.717 should say Appendix 21E instead of 22E, and p.22.8.825 should say Appendix 21F instead of 22F.
- 5.4.2.13 It is noted that a review of the single non-indigenous species (NIS) recorded during the benthic ecology baseline surveys is provided in the impact assessment (e.g. p.22.7.109, p.22.7.339, p.22.7.515). However, in relation to p.22.7.6 – 22.7.28 and Appendix 22C p.1.4, the benthic ecology baseline does not include a review of the existing non-native species that occur within the study area from either the benthic baseline surveys or a review of wider data sources.
- 5.4.2.14 P.22.8.215 acknowledges that fish in active migration may not avoid the ensonified area and therefore the assessment considers the worst-case scenario in terms of disruption to migratory pathways for fish. However, the MMO would find it helpful for the assessment to provide additional context by taking account of mean swimming speeds and determining the period of exposure within the various mortality/recoverable injury/ temporary threshold shift (TTS) impact zones.
- 5.4.2.15 In relation to p.22.8.545 the MMO advises that further justification for the FRR survival rates should be provided. This should take account of factors such as FRR design and operation, the specific design of the cooling water intake tunnels, the effect of biofouling on surface roughness of the intake tunnels, and survival following discharge through the FRR outfall.
- 5.4.2.16 The uncertainty surrounding the estimate in p.22.8.581 should be recognised. In particular, the extent to which bass might congregate in the vicinity of the SZC outfall, particularly once SZB is turned off.
- 5.4.2.17 The MMO advises that in p.22.8.620 and 22.8.622, the significance of the impact should be set in the context of the 40% silver eel escapement target.
- 5.4.2.18 In relation to p.22.8.646, it is the MMO's view that in the absence of information on the rate at which fish may migrate into the GSB area (the replenishment rate), it is difficult to quantitatively assess localised impacts on abundance. If there was no replenishment from outside of GSB, the rates of impingement would decline as local abundance declined. Survival of remaining fish might increase due to less competition for food (density-dependent mortality is likely to apply to at least some marine species). Given that many marine species exhibit seasonal migrations, it is likely that there would be at least annual replenishment of local stock from the wider stock area. Due to high levels of natural spatial and temporal variability in fish abundance, it is unlikely that monitoring could detect any localised changes.



- 5.4.2.19 In relation to p.22.9.124, 22.9.131 and 22.9.136 respectively, the MMO notes that no information is presented on the toxicity of dissolved chromium or zinc, un-ionised ammonia, or hydrazine, to marine mammals. It is considered unlikely that the predicted concentrations would be acutely or sub-lethally toxic to marine mammals, but the assessment is currently incomplete as it does not assess direct toxicity pathways.
- 5.4.2.20 For p.22.10.18 it is unclear how these pressures have been selected. For example, entrainment has been ignored, even though the phytoplankton assessment indicates that primary production within GSB could be affected.
- 5.4.2.21 In the impingement row in Table 22.114 (page 561) 'No' is missing from the 'Assessed for Food Webs' column. It is the MMO's view that it would be helpful to include some further discussion of the potential for and extent of any local changes in fish populations here.
- 5.4.2.22 In Table 22.149, it is unclear whether the construction or operation of the hCDF might affect access for commercial or recreational fishers. The MMO advises that this should be clarified.
- 5.4.2.23 P.22.11.49 suggests that potting for whelks occurs further offshore but p.22.11.50 suggests that the intake/outfall works (at 3km) are beyond the normal range of <10m potters. These statements appear incompatible as the baseline text indicates that most potting activity is undertaken by <10m vessels. The MMO suggests that further clarification is provided.
- 5.4.2.24 To inform the assessment of significance in relation to p.22.11.91, the MMO advises that the Applicant should clarify whether any exclusion zone will be in place during operation of the cooling water intakes and outfalls or whether exclusion areas will only be applied during maintenance works.
- 5.4.2.25 In p.22.12.19, the MMO would expect to see reference to establishing a liaison forum with local fishermen and issuing Notice to Mariners in relation to the construction works. These actions are mentioned in the commercial fisheries assessment but not included in p.22.5 or p.22.12.
- 5.4.2.26 In relation to p.22.12.29 the MMO advises that preparation and agreement of a detailed Comprehensive Impingement Monitoring Programme (CIMP) should be a DCO/DML condition. In addition to the monitoring stated in this paragraph, the CIMP should also include monitoring of survival of fish through the FRR and enable monitoring of long-term changes in impingement as a result of climate change.
- 5.4.2.27 Table 22.155 does not include all the relevant impact pathways that have been assessed. For example, the potential effects of underwater noise and vibration due to dredging activities and impact piling on zooplankton are not included.
- 5.4.2.28 In Table 22.156 (page 609) there appears to be some missing text in the 'Sabellaria spinulosa reef' row and the 'additional mitigation' column.



- 5.4.2.29 In Table 22.157 (page 614) the row describing the BLF construction impact on various fish hearing groups does not include all potential primary or tertiary mitigation. For example, where feasible, piling should be avoided during periods of high water to reduce the potential for underwater noise propagation.
- 5.4.2.30 In relation to the first row 'All fish receptors' in Table 22.162 (page 630), the residual effects should be 'negligible to minor adverse effects'.
- 5.4.2.31 Additionally, in the last row of Table 22.162 on page 632 'Demersal fish and elasmobranchs', the assessment of effects says 'minor positive effects' but 'Residual effects' says 'Minor adverse effects'. The MMO suggests clarity should be provided on this.
- 5.4.2.32 Similarly, in row 3 of Table 22.163 on page 635 the Assessment of effects says 'negligible effects' but 'Residual effects' says 'Minor adverse effects'. Clarification should also be provided here.

5.5 Appendix 22E - Sizewell Marine Mammals Characterisation (TR324)

- 5.5.1 In relation to p.4.2.1 the MMO advises that an additional source of baseline information on harbour and grey seal distributions is available from:

[REDACTED]

- 5.5.2 The Southern North Sea Special Area of Conservation (SAC) was designated in 2019 and is therefore no longer a candidate SAC (cSAC) as stated throughout this document.

5.6 Appendix 22F - Review of Commercial and Recreational Fisheries activity in the vicinity of Sizewell Power Station: Edition 3 (TR123)

- 5.6.1 Section 2.4 references a report by Walmsley *et al* (2019) that is in preparation. This has presumably been published now, and if so, the MMO advises that the information could be included in the baseline.
- 5.6.2 The MMO advises that the Council Regulation (EU) 2019/124 referenced in section 3.4 has now been superseded.
- 5.6.3 The final paragraph of section 11.2 suggests that the recreational angling baseline isn't robust and that further work to characterise the baseline is required.

5.7 Appendix 22G - Predictions of Entrainment by Sizewell C in Relation to Adjacent Fish and Invertebrate Populations (TR318)

- 5.7.1 In section 3.4 the MMO notes the following sentence: 'To obtain estimates of total annual entrainment by species, all samples from a given month were summed and the average entrainment (number per 10 m³) per day was calculated for each month. This number was then multiplied by 4,449,600 to provide estimated entrainment per day for SZB and by 11,392,704 to provide predicted entrainment per day for SZC'. This text is not consistent with step 3 on page 20 where the product is (in our view correctly) divided by 10.
- 5.7.2 In relation to Table 10, the MMO agrees with the approach taken to calculate EAVs and the conclusions of the assessment.



5.7.3 In relation to Table 12, the MMO is aware that these assessments have been made against percentage SSB thresholds based on stock areas. The MMO agrees with this approach and the conclusions of the assessment.

5.8 Appendix 22I - Sizewell C Impingement Predictions Based Upon Specific Cooling Water System Design (TR406)

5.8.1 Following on from 5.4.1.2 above, a specific assessment of the feasibility of installing and operating AFD at SZC should be provided in this Appendix. While an optimal sound field may require a large number of sound projectors, it is unclear whether a functional system could be established using fewer sound projectors.

5.8.2 Additionally, for p.3.3.6, the effectiveness of LVSE on its own (without AFD) in reducing relative impingement is unclear. Further evidence should be provided on this matter.

5.8.3 In Table 3, the MMO advises that the estimated percentage age reductions in impingement mortality require further justification.

5.8.4 In relation to section 5.2, clarification is required for the following text 'Each sample represented the estimated number and weight of fish that would have been impinged during the 24-h period, if the station was working at full capacity (i.e. 4 pumps in operation, which is not always the case during the year).' Upscaling of SZB impingement assumes plant operating at full capacity. This will underestimate actual rates of impingement, which could lead to underestimation of SZC impingement if SZC operates at higher operating capacity than SZB. Therefore, the MMO advises that it would be helpful if the Applicant could provide evidence on the scale of this uncertainty.

5.8.5 In relation to Figure 2, it is unclear how uncertainty in each step of the model has been incorporated. The MMO advises that this requires further explanation. For example, a Monte Carlo simulation could be carried out for impingement estimates.

5.8.6 In relation to section 5.7, the MMO advises that clarification is provided on the detailed design of the FRR system to justify the estimates of FRR survivability.

5.8.7 FRR survivability will also need to take account of the length of the intake tunnel (compared to SZB) and effects of biofouling of the tunnel lining on FRR survivability. The assessment should also consider survival of fish once discharged from the FRR outfall.

5.8.8 The argument in section 5.8.1 is considered applicable to commercially targeted species but less so for migratory species where commercial pressure is close to zero. However, the MMO advises that the extended method could be more applicable for migratory fish species where there is considered to be a significant risk to a particular species

5.8.9 In relation to section 5.10.3, given the uncertainty about the most appropriate stock units to use, it would be helpful if the assessment included some sensitivity analysis in relation to the scale of stocks.

5.8.10 In relation to section 5.12 bullet point c., the MMO advises that it may be more appropriate to express this in relation to the available headroom in the silver eel escapement target if this information is available from the EA.



5.8.11 The MMO advises that the evidence in section 7.6 supports the assertion that the Blackwater herring stock is unlikely to comprise a substantial proportion of fish impinged at SZC, but it remains unknown (and unknowable) whether any individuals from the Blackwater stock might be impinged. If it was assumed that Blackwater fish were impinged pro rata this would represent a very small impact on the Blackwater stock.

5.8.12 The MMO notes in relation to section 8.7 that no assessment of entrapment of invertebrates is provided (entrainment plus impingement). This is an omission and should be provided.

5.9 Appendix 22J - Modelling of Sediment Dispersion of Dredge Material for SZC Construction and Operation (TR480)

5.9.1 In addition to analysis of the SSC and sedimentation plumes, the sediment modelling considered the intersections between the SSC plume and the designated breeding colonies to allow the Habitats Regulations Assessment (HRA) and ES to assess the potential for indirect effects, whereby marine foraging birds may have reduced ability to capture fish prey. However, in relation to section 3, the MMO notes that it is unclear why a similar analysis has not been done for harbour porpoise (or their prey) which is a designated interest feature of the Southern Northern Sea SAC, located adjacent to the proposed development.

5.10 Appendix 22L - Underwater Noise Effects Assessment for Sizewell C: Edition 2 (TR312)

5.10.1 In relation to section 2.1.4, the MMO notes that the source level of dredging has been derived from Robinson *et al* (2012), which measured noise levels generated by a large trailing suction hopper dredger (THSD). At Sizewell C, dredging at the location of the BLF is anticipated to be by plough dredger with cutter suction dredging anticipated at the locations of the infrastructure installations. It is acknowledged that a large TSHD is likely to generate the highest levels of underwater noise and a worst-case assumption has therefore been made in the assessment. However, the MMO advises that it would be helpful for the assessment to explain how a large TSHD is considered to be representative of the proposed dredging activities and to describe the anticipated differences in the underwater noise generated by the types of dredging that are proposed at Sizewell C (see Jones and Marten, 2016).

5.10.2 Due to the proximity of the proposed development to the Southern North Sea SAC, which is designated for harbour porpoise, the underwater noise assessment will need to take account of the latest guidance on noise management in harbour porpoise SACs that has recently been published by JNCC (2020): JNCC (2020). Guidance on noise management in harbour porpoise SACs 2020. Available at:

[REDACTED]

5.10.3 In relation to the Southern North Sea SAC, a Site Integrity Plan demonstrating no impact to the site will need to be submitted to, and approved by, the MMO before the commencement of any construction activities that could affect the integrity of the Southern North Sea SAC. This follows a review of consents undertaken by the SoS for the Department for Business Energy and Industrial Strategy alongside the MMO. More information can be found at:



- [REDACTED]
- [REDACTED]
- 5.10.4 In relation to section 6.1.2, the MMO advises that revised noise exposure criteria to predict the onset of auditory effects in marine mammals have recently been published (Southall *et al.*, 2019), but are not reviewed in this Appendix. These criteria evaluate and update the Southall *et al.* (2007) guidelines in light of subsequent scientific findings. These revised noise exposure criteria support and complement the National Oceanic and Atmospheric Administration (NOAA) (2018) thresholds.
- 5.10.5 In relation to section 6.2.2, the MMO advises that the assessment approach for fish does not include any assumptions of behaviour. Fish that are in active migration are unlikely to remain within the cumulative impact zones for 24 hours. It is more likely that migratory fish do not deviate and continue on their swimming path despite the potential adverse conditions, and therefore the assessment should consider the potential cumulative effects for the fish should this occur. Such a consideration should take account of mean swimming speeds and period of exposure within the various mortality/recoverable injury/Temporary threshold shift impact zones.
- 5.10.6 In addition to taking account of JNCC guidelines for minimising the risk of injury to marine mammals from using explosives (JNCC, 2010) in section 8.1.1.1, the Applicant should also consider a recent paper that has been published on underwater noise abatement measures from pile-driving and explosions that complements and builds on the JNCC guidelines (Merchant and Robinson, 2020).
- 5.10.7 The MMO assumes that in section 8.3, the sentence “Drilling has very minor auditory effect zones and is unlikely to have negligible effects on marine mammals or fish” is incorrect and should read “Drilling has very minor auditory effect zones and is likely to have negligible effects on marine mammals or fish.”

5.11 Appendix 22N - Sizewell C Draft Marine Mammal Mitigation Protocol (MMMP) (TR509)

- 5.11.1 It is noted that the proposed draft MMMP will be updated once final construction methods have been confirmed and agreed in consultation with relevant Statutory Nature Conservation Bodies (SNCB)s. In addition to taking account of the JNCC guidelines for minimising the risk of injury to marine mammals from using explosives (JNCC, 2010), the Applicant should consider in the final MMMP the latest guidance on noise management in harbour porpoise SACs that has recently been published by JNCC (2020), due to the proximity of the proposed development to the Southern North Sea SAC. The Applicant should also consider a recent paper that has been published on underwater noise abatement measures from pile-driving and explosions that complements and builds on the JNCC 2010 guidelines (Merchant and Robinson, 2020). See both listed in the references.

5.12 Appendix 22O - Eels Regulations Compliance Assessment

- 5.12.1 In relation to section 6.1.2, the MMO notes that it is likely further discussion will be required around the FRR design and significance of impact in the context of the 40% silver eel escapement target, in light of recent EA advice on consented NNB projects.



5.13 Chapter 24 – Marine Navigation

5.13.1 The MMO advises that the marine components of the proposed development will take place in an area that is actively fished by a small number of local inshore commercial fishing vessels, and a larger number of recreational vessels. These fishers operate relatively close to shore and operate directly from the local beach and nearby ports such as Southwold and Aldeburgh. There are also several windfarms operating off the East Anglian coast, with vessels regularly transiting through the area to undertake construction and maintenance activities. The proposed works and the increase in vessel traffic in the area created by the development are likely to disrupt access to current fishing grounds, cause some disruption to navigation and create an increased navigational hazard in the area.

6. Shadow Habitats Regulations Assessment (HRA)

6.1 General Comments

- 6.1.1 The MMO broadly agrees with the conclusions of the Shadow Appropriate Assessment (AA). However, the assessment would greatly benefit from showing more detail around the conclusions drawn and this would allow MMO to agree beyond reasonable scientific doubt with the conclusions. At this stage uncertainty remains. The MMO wishes to highlight the below gaps that must be addressed.
- 6.1.2 The MMO agree with the list of European sites that have been screened in on a conservative basis. We also broadly agree with the sites and qualifying interest features 'screened in' for further assessment (Volume 1, Table 5.6). However, this is less clear for mobile species and we note that consideration of effects on some primary habitats and supporting habitats are lacking.
- 6.1.3 Additionally, some of the baseline information in Volume 1, Section 6.3 (Birds) is based on data that is ten or more years old. This would benefit from review and update where possible. This is particularly the case for species which demonstrate fluctuating trends over relatively short time scales (such as terns).
- 6.1.4 The assessment for protected habitats (Volume 1, Section 7), appears to miss some primary habitat and supporting habitat impact pathways.
- 6.1.5 The MMO broadly supports the assessment in relation to birds (Volume 1, Section 8), but there are some uncertainties concerning the significance of effects of thermal plumes and loss of prey resource for little tern (which have a restricted foraging range) and, to a lesser extent, common tern (which forages more widely). The uncertainties relating to changes in prey resource stem from uncertainties concerning estimation of the impact of entrapment on local fish populations which is detailed above in our comments on ES Chapter 22 'Marine Ecology and Fisheries'.
- 6.1.6 The MMO considers the marine mammal (Volume 1, Section 9) and migratory fish (Volume 1, Section 10) assessments are robust and we have very few comments.
- 6.1.7 The MMO have minor comments on Volume 2 'Assessment of Alternative Solutions' and Volume 3 'Imperative Reasons of Public Interest'. Our comments primarily



relate to minor uncertainties concerning the effects on Natura 200 features highlighted in our comments on the Shadow AA.

6.2 Comments on Volume 1: Screening and Appropriate Assessment Part 1 of 5

- 6.2.1 In relation to section 3.4.14 regarding in combination effects, the MMO notes that where mobile species are concerned, effects may occur within or outside the boundaries of the designated site and assessments should consider plans or projects that may affect these species throughout their range.
- 6.2.2 In relation to section 4.2.16, the MMO advises that seabird foraging ranges have recently been revised and updated (Woodward *et al*, 2019). The MMO are likely to agree with the conclusion that there is limited potential for significant effect, however the new data should be reviewed and included in this assessment.
- 6.2.3 In Table 4.5, the supporting habitat features are not identified in column 4. This results in some potential impact pathways via supporting habitats being missed e.g. in Table 5.6 and, for example, no assessment of the effects of dredging and disposal on supporting habitats of the Outer Thames Special Protection Area (SPA) in section 7. The MMO advises that supporting habitat features must be assessed here.
- 6.2.4 In relation to section 5.3.3, the MMO notes that it is difficult to follow the audit trail between the appendices and the tables. Some of the statements are unclear as to which sites they apply to and thus which sites have been scoped in/out in relation to the impact pathways for specific features. For example, in Table 5.3, '7 - Direct habitat loss and fragmentation', it is unclear to which sites the statements a) to d) apply. The MMO advises that this is made clearer.
- 6.2.5 In relation to 'Radiological effects' in Tables 5.2, 5.3, 5.4 and 5.5, the MMO advises that the Applicant should consider the potential impact of accidental releases during construction/decommissioning and operation unless Natural England or the Environment Agency confirm that they are content for this risk to be screened out.
- 6.2.6 In relation to 'Direct habitat loss and fragmentation' in Table 5.2, the MMO notes that in '7a' the stated impact pathway relates to mobile features rather than habitats and associated species. The MMO advises that this impact pathway should only consider direct impacts on protected habitats. Marine construction activities will directly affect supporting habitats within the Outer Thames SPA and Southern North Sea SAC and potentially indirectly affect habitat features in the Minsmere to Walberswick SAC, SPA and Ramsar site. This impact pathway appears to have been ignored in the assessment.
- 6.2.7 Additionally, in '7b', there is direct loss and some disturbance of supporting habitat features associated with the Outer Thames SPA and Southern North Sea SAC and potentially indirect effects to habitat features in the Minsmere to Walberswick SAC, SPA and Ramsar site. These impact pathways should both be assessed.
- 6.2.8 In relation to 'Disturbance effects on species populations' in Table 5.2, the MMO notes that some marine invertebrates are sensitive to underwater noise. The Minsmere to Walberswick Ramsar site includes mudflat habitat (primarily within the Blyth Estuary) which may contain characterising invertebrate species that are sensitive to underwater noise. It is noted that there are no detailed conservation



objectives for the Ramsar site and Natural England's advice should be sought as to whether this impact pathway should be assessed in the shadow HRA.

- 6.2.9 In relation to 'Physical interaction' in Table 5.2, the MMO advises that characterising species of features such as mudflat within the Minsmere to Walberswick Ramsar site may have pelagic larvae that would be sensitive to entrainment impacts. There is thus a potential impact pathway. Again, it is noted that there are no detailed conservation objectives for the Ramsar site and Natural England's advice should be sought as to whether this impact pathway should be assessed in the shadow HRA.
- 6.2.10 The MMO advises that the assessment of 'Disturbance effects on species populations' in Table 5.4 should include harbour and grey seal features.
- 6.2.11 In relation to 'Water quality effects – marine environment' in Table 5.5, the MMO advises that although water quality would not directly affect the designated sites for fish species, these species are mobile and may be affected by water quality conditions outside the designated sites. If sites are to be screened in for entrapment pressure on species associated with these sites, the MMO suggest they should also be screened in for marine water quality impacts.
- 6.2.12 In relation to 'Disturbance effects to species populations' in Table 5.5, the MMO advise that mobile features outside of their designated sites may be exposed to underwater noise changes. If sites are to be screened in for entrapment pressure on species associated with these sites, the MMO suggest they should also be screened in for disturbance impacts.
- 6.2.13 The 'recent' population estimates and data referred to in Table 6.1, 6.5 and 6.21 are not very recent. Populations of species such as Sandwich tern fluctuate markedly over time. Consequently, the MMO recommends that up to date estimates (preferably from the last 5 years) are sought from Natural England for all listed species.
- 6.2.14 The MMO advises that sections 6.4.2, 6.4.18 and 6.4.36 should also reference the 2019 Article 17 report, available at:
[REDACTED]
- 6.2.15 In relation to section 6.5, there is no information provided on twaite shad populations associated with non-UK SACs. The MMO advises this is provided.
- 6.2.16 In relation to section 7.8.1, and as per our comments above in relation to 'Disturbance effects on species populations' and 'Physical interaction' in Table 5.2, additional impact pathways should be considered in relation to the Ramsar site.
- 6.2.17 In relation to section 7.8.8, the MMO advises that the site also includes intertidal mudflat primarily within the Blyth Estuary.
- 6.2.18 In relation to section 7.8.9, the MMO advises that the assessment should consider mudflat habitat.
- 6.2.19 In relation to section 7.8.10, the MMO advises that the assessment should consider the interaction with the Blyth Estuary; Blyth estuary overlaps with the Minsmere-Walberswick SPA and could potentially impact how seawater percolates through sediment to the coastal lagoon at Minsmere.



- 6.2.20 In relation to section 8.3.22 it is likely that the terns will forage predominantly along the coast in shallow water rather than offshore. Therefore, the MMO advises that percentages of key foraging area affected by the thermal plumes may be greater than estimated.
- 6.2.21 It is unclear from the text what accounts for the differences between the numbers quoted in sections 8.3.24 and 8.3.22. The MMO advises that this is clarified.
- 6.2.22 In relation to section 8.3.99 and as detailed above in our comments on the marine ecology and fisheries chapter of the ES, there are some significant uncertainties surrounding the entrapment estimate relating to limitations of survey data, uncertainties concerning the effectiveness of LVSE design in reducing impingement, choice of method for EAVs, replenishment rates and density dependent mortality. These uncertainties will need to be worked through in the fish assessment before confirming whether effects of local loss of prey resources for birds might be significant.
- 6.2.23 Section 8.3.104 discusses little tern's breeding and foraging areas. The MMO advises that the Applicant should confirm if this information remains accurate.
- 6.2.24 In relation to sections 8.3.106 and 8.8.292, the MMO notes that due to the complexities of the plumes and uncertainties concerning their effect on foraging, it is difficult to be completely confident that the increase in plume extent (combined for SZB and SZC) in key foraging areas will avoid adverse effect. This is a matter of fine judgement concerning the level of precaution that should be applied and will require further discussion.
- 6.2.25 In relation to sections 8.3.128 and 8.8.350, and as highlighted in our comments above on the marine ecology and fisheries chapter of the ES, there are some significant uncertainties surrounding the entrapment estimate relating to limitations of survey data, uncertainties concerning the effectiveness of LVSE design in reducing impingement, choice of method for EAVs, replenishment rates and density dependent mortality. These uncertainties will need to be worked through in the fish assessment before the Applicant is able to confirm whether effects of local loss of prey resources for birds might be significant.
- 6.2.26 In relation to sections 8.3.209, 8.8.557 and 8.9.7, and as per the comments above, there remain some uncertainties concerning the significance of the effects of the project alone on little terns associated the Alde-Ore Estuary SPA. Similar uncertainties pertain to the significance of effects on the Ramsar site features discussed in sections 8.4.5 and 8.4.6.
- 6.2.27 As we have identified uncertainties concerning the significance of effects of the project on its own, there are necessarily also uncertainties concerning the in-combination effect in section 8.3.214 and 8.9.9.
- 6.2.28 In relation to section 8.8.560, the MMO notes that as the potential for adverse effects on marsh harrier have been acknowledged for the project alone, it is assumed that there also must be potential for adverse effects on marsh harrier in combination (if not alone). Additionally, as there are uncertainties concerning the significance of effects of the project on little tern on its own, there are necessarily



also uncertainties concerning the in-combination effect. These uncertainties make it problematic to reach a conclusion on integrity.

- 6.2.29 In relation to section 8.9.1 and as per our comments above on Table 5.2 'Disturbance effects on species populations' and 'Physical interaction', additional impact pathways should be considered in relation to the Ramsar site.
- 6.2.30 In relation to 8.10.4, our comments on the Alde-Ore Estuary SPA/Ramsar and Minsmere to Walberswick SPA/Ramsar in relation to little tern also apply to the Outer Thames SPA.
- 6.2.31 Furthermore, in relation to section 8.10.23, the same concerns that apply to little tern and the effects of thermal plumes on foraging also apply to the common tern, albeit to a lesser extent. Similarly, in relation to section 8.10.45 the same concerns that apply to little tern and the effects on prey resources also apply to common tern, but again to a lesser extent.
- 6.2.32 In relation to section 8.10.6, and as per our comments above, there remain some uncertainties concerning the significance of the effects of the project alone on the little tern and common tern which will require further discussion.
- 6.2.33 Additionally, in relation to section 8.10.71, due to the uncertainties associated with the assessment 'alone' there are also uncertainties with the in-combination assessment.
- 6.2.34 In relation to Tables 9.1 and 9.3, hearing damage and disturbance from underwater noise may also affect the population of the qualifying species. This is assessed in the shadow HRA and should be referenced as a potential impact pathway here.
- 6.2.35 The MMO advises that the DCO application for Thanet Extension has been refused and this project can be removed from the in-combination assessment in sections 9.4.64, 9.5.74, and 9.6.45.
- 6.2.36 The text in section 9.5.19 should reference the most recent JNCC guidance (2020); 'Guidance on noise management in harbour porpoise SACs 2020'. Available at:
[REDACTED]
- 6.2.37 In relation to section 10.5.12, the MMO advises that the Applicant needs to provide additional information to justify assessments of the effectiveness of the LVSE intakes. However, this will not be material to the conclusions in relation to twaite shad which are supported by the MMO.
- 6.2.38 The conclusion for habitats in section 11.2.4 is largely supported by the MMO with only minor uncertainties relating to a lack of assessment of the mudflat feature of the Minsmere to Walberswick Ramsar site.
- 6.2.39 There remains some minor uncertainty concerning conclusions in section 11.3.5 in relation to birds. These relate to potential effects on little tern (and to a lesser extent, common tern) from thermal plumes and depletion of local prey resources.
- 6.2.40 The conclusions in relation to marine mammals in section 11.4.4, and the conclusions in relation to migratory fish in section 11.5.3 are supported by the MMO. We would however, defer to Natural England on the range of some mobile species such as grey seal, and refer to our comment in 5.10.3 regarding a SIP.



6.2.41 The MMO has no comments on part 2, part 3, or part 5 of the Screening and Appropriate Assessment (AA).

6.3 Comments on Volume 1: Screening and Appropriate Assessment Part 4 of 5

6.3.1 Our comments above on the main report (Tables 5.2 to 5.5) should also be considered in relation to Appendices B1, B2 and B3.

6.3.2 In relation to Appendix C, Table C1 the MMO advises that the impact of Galloper Wind Farm Limited will not be in the baseline and therefore should not be screened out. This is because although the construction phase will not overlap, the wind farm will be in operation during the construction and operation of SZC. The table should also be updated to remove Vattenfall Wind Power Limited as the DCO for this development has been refused.

6.3.3 Our comments above on the main report (sections 7 to 10) should also be considered in relation to Appendices D1, D2 and D3.

6.4 Comments on Volume 2: Stage 3 Assessment of Alternative Solutions

6.4.1 It is noted in our comments above on the main report that other significant effects may be identified based on further review and update of the shadow AA. This is relevant to sections 1.1.3, 2.3.1 and 4.2.

6.5 Comments on Volume 3: Stage 4 Imperative Reasons of Public Interest

6.5.1 In relation to section 1.6.5, the MMO advises that the Applicant should consider whether the need is overriding in relation to the potential damage to European sites, and not just in relation to it being imperative.

6.5.2 In relation to section 4.3.2, the MMO advises that limited reliance should be placed on the strategic assessment prepared in support of the National Policy Statement (EN-6) because this was a much less detailed assessment than the AA prepared for SZC.

6.5.3 In relation to section 9.1.3 and as detailed above, it is not yet clear whether all significant effects have yet been identified in the AA. The extent to which the need is overriding will need to be considered in relation to an agreed assessment of the damage to Natura features.

7. References

Blanco, B.L.D.S.R., and Brampton, A.H. (2017). Is The North Atlantic Oscillation Affecting The Longshore Drift Rate In South-East England? Proceedings of Coastal Dynamics Conference 2017, 12-16 June 2017. Helsingør, Denmark.

JNCC (2020). Guidance on noise management in harbour porpoise SACs 2020. Available at: [REDACTED].

Jones, D. Marten, K. (2016). Dredging Sound Levels, Numerical Modelling And EIA. Available at: [REDACTED]



Merchant, N.D., Robinson, S.P. (2020). Abatement of underwater noise pollution from pile-driving and explosions in UK waters. Report of the UKAN workshop held on Tuesday 12 November 2019 at The Royal Society, London, p. 31. doi: 10.6084/m9.figshare.11815449.

National Infrastructure Planning, 'The Eggborough Gas Fired Generating Station Order 2018', Generating Stations: Eggborough CCGT [website], 2018. Available at:
[redacted]
[redacted]

National Marine Fisheries Service. (2018). 2018 Revisions to: Technical Guidance for Assessing the Effects of Anthropogenic Sound on Marine Mammal Hearing (Version 2.0): Underwater Thresholds for Onset of Permanent and Temporary Threshold Shifts. U.S. Dept. of Commer., NOAA. NOAA Technical Memorandum NMFS-OPR-59, p. 167.

Southall et al. (2019). Marine Mammal Noise Exposure Criteria: Updated Scientific Recommendations for Residual Hearing Effects. pp. 135-232. Doi:
[redacted]
[redacted]
[redacted]
[redacted]

UK Government, 'The Newhaven Harbour Revision Order 2016', UK Statutory Instruments [website], 2016, [redacted]
[redacted]

Woodward, I., Thaxter, C.B., Owen, E., Cook, A.C.P. (2019) Desk-based revision of seabird foraging ranges used for HRA screening. Report of work carried out by the British Trust for Ornithology on behalf of NIRAS and The Crown Estate. BTO Research Report No. 724, December 2019.

