



The Sizewell C Project

5.10 Shadow Habitats Regulations Assessment Addendum Appendix 9A: Southern North Sea Site Integrity Plan - Tracked Changes Version

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EXECUTIVE SUMMARY

Level 1 control documents will either be certified under the DCO at grant or annexed to the DoO. All are secured and legally enforceable. Some Level 1 documents are compliance documents and must be complied with when certain activities are carried out. Other Level 1 documents are strategies or draft plans which set the boundaries for a subsequent Level 2 document which is required to be approved by a body or governance group. The obligations in the DCO and DoO set out the status of each Level 1 document.

This Draft Site Integrity Plan is a Level 1 document which concerns the construction of the Beach Landing Facilities (BLF) as part of the Sizewell C Project.

Under Condition 40(2) of the Deemed Marine Licence in Schedule 20 of the **draft DCO, (Doc. Ref. 3.1(I))** prior to the commencement of impact piling associated with the BLF, a Site Integrity Plan must be submitted to and approved by the MMO. The Site Integrity Plan must be in general accordance with this Draft Site Integrity Plan.

Where further documents or details require approval, this document states which body or governance group is responsible for the approval and/or must be consulted. Any approvals by East Suffolk Council, Suffolk County Council or the MMO will be carried out in accordance with the procedure in Schedule 23 of the DCO. The DoO establishes the governance groups and sets out how these governance groups will run and, where appropriate, how decisions (including approvals) should be made. Any updates to these further documents or details must be approved by the same body or governance group and through the same consultation and procedure as the original document or details.

Where separate Level 1 or Level 2 control documents include measures that are relevant to the measures within this document, those measures have not been duplicated in this document, but cross-references have been included for context. Where separate legislation, consents, permits and licences are described in this document they are set out in the **Schedule of Other Consents, Licences and Agreements** (Doc Ref. 5.11)

For the purposes of this document the term 'SZC Co.' refers to NNB Nuclear Generation (SZC) Limited (or any other undertaker as defined by the DCO), its appointed representatives and the appointed construction contractors.

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1 INTRODUCTION

1.1 Objective of the SIP

1.1.1 This draft Site ~~integrity~~ Integrity Plan (SIP) for the Southern North Sea Special Area of Conservation (SNS SAC) has been produced to ensure there is no significant disturbance of harbour porpoise, *Phocoena phocoena*, as a result of underwater noise from the Sizewell C Project in-combination with other plans and projects, so that there is no potential for an ~~adverse effect on the integrity~~ Adverse Effect on Integrity (AEOI) of the SNS SAC in relation to the conservation objectives for harbour porpoise. A final updated SIP will be produced in general accordance with this Draft SIP, and this must be submitted to the MMO for its approval prior to the commencement of impact piling associated with the BLF of the temporary MBIF pursuant to condition 40 of the Deemed Marine Licence.

1.1.1 This draft SIP sets out the approach for the Sizewell C Project to ensure the avoidance of AEOI for the SNS SAC in-combination with other measures. The final SIP must be submitted to Marine Management Organisation (MMO) the prior to piling on the Beach Landing Facility or the Temporary Marine Beach Landing Facility commencing. The final SIP will include any updated information on management measures, advice or guidance for the SNS SAC, final design of the project and the in-combination assessment will be revised based on the latest information and scheduling of works for other plans and projects.

1.1.2 This version has been updated to address comments from Natural England submitted at deadline 7 [REP7-142] during the examination process.

1.1.3 This draft SIP has also been updated following the latest Underwater Noise Report ([REP5-124]).

~~1.1.2 The marine works associated with the Sizewell C Project are located wholly within the winter area of the SNS SAC. The winter area of the SNS SAC (12,696km²; **Figure 1-1**), has been recognised as an area within the SNS SAC that has high densities of harbour porpoise during the winter period (October to March, inclusive; see **section 1.3**).~~

~~1.1.3~~ 1.1.1 ~~This~~ This draft SIP provides the following:

- ~~A summary~~ An overview of the ~~relevant~~ requirement for a SIP for the marine components of the Sizewell C Project in ~~section 1.2~~ Section 1.1.

- An overview of the SNS SAC and Conservation Objectives for harbour porpoise in ~~section 1.3~~Section 0.
- ~~An outline of purpose of this document and proposed consultation schedule in section 1.4.~~
- A summary ~~of the updated assessment~~ of the potential underwater noise effects of the Sizewell C Project alone and in-combination with other plans and projects ~~(derived from the Shadow HRA Report (Doc Ref. 5.10)) in section 2~~that could disturb harbour porpoise in the Southern North Sea SAC in Section 0.
- Mitigation and management measures in ~~section 3~~Section 0.
- Draft SIP summary and conclusions in ~~section 4~~Section 0.

~~1.1.4~~1.1.1 ~~It is important to note that this SIP for the SNS SAC has been produced to ensure there is no significant disturbance of harbour porpoise as a result of underwater noise from the Sizewell C Project in-combination with other plans and projects, so that there is no potential for an adverse effect on the integrity of the SNS SAC in relation to the conservation objectives for harbour porpoise. A separate Marine Mammal Mitigation Protocol (MMMP) will be prepared (with a draft MMMP prepared as Appendix 22N to Volume 2, Chapter 22 of the ES) to ensure there is no~~ in general accordance with the draft MMMP (Doc Ref. 6.3 22N(B)(secured pursuant to Condition 40 of the DML)) to reduce the risk of auditory injury in marine mammals as a result of underwater noise during piling. In addition, ~~any requirements to reduce disturbance in relation to~~ if required, a European Protected Species (EPS) ~~will be captured through the EPS Licencing process, if required. licence application will be submitted prior to construction of the offshore components in accordance with relevant legislation.~~

1.1.2 It is also important to note that the requirement for any unexploded ordnance (UXO) clearance has not been included in the SIP, as UXO clearance has not been included in the DCO Application, but if required, will be included in separate Marine Licence application.

1.1.3 If UXO clearance is required, further assessments will be conducted, based on the latest information, guidance and mitigation techniques, and submitted as a separate Marine Licence, including potential effects on the SNS SAC and the requirements for any EPS licence as set out in the Schedule of Other Consents, Licences and Agreements (Doc Ref. 5.11(B)). Therefore, any potential UXO clearance associated with marine works has not been included in this SIP.

1.1.4 It has been agreed with the MMO a separate Marine License will be sought for UXO clearance prior to any UXO clearance being carried out

1.2 Requirement for a SIP

~~1.1~~ Project background

~~1.1.6~~ 1.2.1 The proposed Sizewell C nuclear power station ~~is to~~ will be located on land immediately to the north of Sizewell B nuclear power station, on the Suffolk coast approximately midway between Lowestoft to the north and Ipswich to the south.

1.2.2 The marine works associated with the Sizewell C Project are located wholly within the winter area of the SNS SAC.

1.2.3 The assessments in the **Shadow HRA Report** (~~Doc Ref~~ [APP-145]) and **Shadow HRA Addendum** ([AS-178]) indicate that there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise from the Sizewell C Project alone. ~~5.10~~

1.2.4 Therefore, as outline above, the SIP is to ensure there is no significant disturbance of harbour porpoise as a result of underwater noise from the Sizewell C Project in-combination with other plans and projects, so that there is no potential AEOL of the SNS SAC in relation to the conservation objectives for harbour porpoise.

~~1.1.7~~ 1.2.5 The assessments in the **Shadow HRA Report** ([APP-145]) and **Shadow HRA Addendum** ([AS-178]) indicate that underwater noise from the piling of the ~~BLF~~ beach landing facility and temporary MBIF (BLFs) could result in the greatest potential disturbance of harbour porpoise. Therefore, as a precautionary approach, this has been included as the worst-case scenario in this draft SIP.

~~1.1.0~~ Since the completion of the Shadow HRA Report (Doc Ref. 5.10) in early 2020, there have been some updates for the permanent beach landing facility (BLF) and the inclusion of a proposed temporary BLF.

~~b)~~ a) Piling of BLFs

~~1.1.8~~ 1.2.6 The Sizewell C Project marine works will include an enhanced permanent BLF for use during construction ~~and,~~ which ~~would~~ will be retained for operational purposes and ~~the option for~~ a temporary BLF for use only during the construction phase.

i. Enhanced permanent BLF

~~4.1.9~~1.2.7 The enhanced permanent BLF design is for 24 piles, with 12 piles and 4 dolphin / fenders piled below mean high water spring tide (MHWS). The pile diameter ~~would~~will be 1m and approximately 2.5m for dolphin / fender piles. The maximum hammer energy ~~would~~will be 120kJ for the piles and up to 280kJ for the dolphins / fenders piles.

~~4.1.10~~1.2.8 Up to 16 piles (including dolphins / fenders) ~~would~~will be required to be installed for the enhanced permanent BLF in the water below MHWS. Two piles or two dolphins / fenders could be piled per day, therefore 8 days of piling would be required in this scenario.

~~4.1.11~~1.2.9 If it is assumed, as a worst-case, that only one pile could be installed per day, piling ~~would~~will require 16 days. However, based on 45 minutes and 20 minute soft-start to install each pile, the total active piling time ~~would~~will be 17.5 hours (less than 1 day).

~~4.1.12~~1.2.10 As a worst-case it ~~is~~has been assumed in that impact piling would be used and assessments in this draft SIP, however as outlined in Section 0 are based on the current Statutory Nature Conservation Bodies (SNCB) guidance for the Effective Deterrence Ranges (EDR) for pin-piles without mitigation. However, it is proposed to use a hydrohammer to minimise the effects of underwater noise, a hydrohammer will be used. A hydrohammer has two hydraulic plungers filled with water designed to dampen the impact and reduce the source noise of impact piling. Hydrohammers may reduce sound exposure levels (SEL) by 3 to 6dB and sound peak pressure level (SPL) by 9 to 12 dB.

ii. Temporary BLF

~~4.1.13~~1.2.11 The temporary BLF ~~would~~will be approximately 505m in length and extend approximately 440m seaward of MHWS. The temporary BLF ~~would~~will consist of a trestle pier and an enlarged unloading platform with a single berth. The trestle pier ~~would~~will require 86 piles, 74 of which ~~would~~will be below MHWS. Piles ~~would~~will be approximately 1.2m in diameter and the unloading platform ~~would~~will consist of 32 piles with 1.2m diameter. Four mooring dolphins with a diameter of approximately 2.5m ~~would~~will also be installed at the unloading platform. Piling of the temporary BLF ~~would~~will be similar to the piling for the enhanced permanent BLF, with a maximum hammer energy of 120kJ for the piles and up to 280kJ for the dolphins / fenders piles.

~~4.1.14~~1.2.12 Up to 110 piles (including dolphins / fenders) ~~would~~will be required to be installed for the temporary BLF in the water below MHWS. Two piles or

two dolphins / fenders could be piled per day, resulting in 50 days of piling. ~~If it is assumed, as a worst-case, that one pile could be installed per day, piling would require 110 days.~~ However, based on 45 minutes and 20 minute soft-start to install each pile, the total active piling time ~~would~~ will be up to 120 hours (5 days).

~~4.1.15~~ 1.2.13 As a worst-case it ~~is~~ has been assumed, ~~as outlined above,~~ that impact piling would be used and the assessments in Section 0 are based on the current SNCB guidance for the EDR for pin-piles without mitigation. ~~However,~~ ~~however, it is proposed to use~~ a hydrohammer will be used to minimise the effects of underwater noise.

ii. ~~Permanent~~ Installation of permanent BLF and temporary BLFs ~~MBIF~~

~~4.1.1~~ 1.2.14 Installation of the enhanced permanent BLF is anticipated to last six months. Installation of the temporary BLF is anticipated to last nine months.

~~4.1.1~~ 1.2.15 ~~Installation~~ As outlined in the latest Underwater Noise Report ([REP5-124]), installation is assumed to start in August 2022 for both BLFs and be completed by April 2023 of the construction phase. No piling ~~would~~ will occur in the months of May, June or July to minimise the potential for effects on designated breeding birds. Assuming no temporal overlap of piling activities, a total of 60 days piling ~~would~~ will occur during this period, based on two piles being installed per day. If piling for the ~~piers for the~~ enhanced permanent BLF and temporary ~~BLF occurred~~ MBIF occur simultaneously, a total of 54 days of piling ~~would be required.~~ will be required. If piling for the enhanced permanent BLF and temporary MBIF occurred concurrently a total of 48 days of piling will be required. No consecutive piling will occur when the mooring dolphins are installed.

~~4.2.0~~ — ~~It is anticipated that the temporary BLF would not progress seaward beyond the outer longshore sand bar before the enhanced permanent BLF was completed. Therefore, the worst case underwater noise scenario for the combined effects of installation of the two BLFs would be installation of two piles per day at the enhanced permanent BLF and two piles per day within the sand bar for the temporary BLF (four piles in a 24-hour period).~~

~~4.3.0~~ — ~~A piling restriction to reduce the incidence of marine noise mean no additional piling would occur when mooring dolphins for the enhanced permanent BLF are installed. Therefore, the maximum duration for daily overlap between the two BLFs would be six days of piling.~~

~~—) Unexploded Ordnance (UXO) clearance~~

~~4.5.0~~ — ~~It has not been confirmed if any items of UXO are present in the vicinity of the marine works area, thus specific details are not currently available. If~~

~~UXO is discovered at the site and alternative disposal methods or relocation are not possible, underwater detonations may be required.~~

~~1.6.0 If UXO clearance is required, further assessments will be conducted and separate licences will be prepared, including the requirements for any EPS licence. Therefore, any potential UXO clearance associated with marine works has not been included in this SIP.~~

1.7 The Southern North Sea SAC

b) Site information

~~1.7.1~~ 1.2.16 The SNS SAC, designated in 2019, has been recognised as an area with persistent high densities of harbour porpoise (Ref. 1.1).

~~1.7.2~~ 1.2.17 The SAC covers both winter and summer habitats of importance to harbour porpoise, with 27,028km² of the site being important in the summer (April to September) and the 12,696km² of the site being important in the winter period (October to March) (Ref. 1.1).

~~1.7.3~~ 1.2.18 The majority of the SAC is less than 40m in water depth, reaching up to 75m in the northern-most areas. The seabed is mainly sublittoral sand and sublittoral coarse sediment (Ref. 1.1). The site overlaps with a number of other European sites, including the Dogger Bank SAC, Margate and Long Sands SAC, Haisborough, Hammond and Winterton SAC and North Norfolk Sandbanks and Saturn Reef SAC, all of which have important sandbank and gravel beds.

~~1.7.4~~ 1.2.19 As a wide-ranging species, harbour porpoise within the SAC cannot be considered isolated in relation to the rest of the population. Harbour porpoise within the SAC are part of the wider North Sea Management Unit (MU) population (Ref. 1.2). JNCC and Natural England (Ref. 1.2) consider that it is therefore not appropriate to use site population estimates in assessments, and the assessments need to take into consideration population estimates at the MU level to account for daily and seasonal movements of the animals. Currently the population estimate for the harbour porpoise North Sea MU is ~~345,373~~ 346,601 (coefficient of variation = ~~0.52~~ 0.09; 95% confidence interval = ~~246,526 – 495,752~~ 289,489 – 419,967; Ref. ~~2.3~~ 1.3).

~~1.1.1~~ 1.2.20 The Sizewell C Project marine works area ~~is~~ will be located wholly within the winter area of the SAC. The winter SNS SAC area is 12,696km² and the winter period is October to March, inclusive (Ref. 1.4).

~~4.1.2~~1.2.21 The Sizewell C Project marine works area ~~is~~will be located 49.4km (at its closest point) from the summer area of the SNS SAC. Therefore, there is no potential for any effects on the summer area.

c) **Conservation Objectives**

~~4.7.5~~1.2.22 The Conservation Objectives for the SNS SAC are designed to help ensure that the obligations of the Habitats Directive can be met. Article 6(2) of the Directive requires that there should be no deterioration or significant disturbance of the qualifying species or to the habitats upon which they rely.

~~4.7.6~~1.2.23 The Conservation Objectives for the SAC are (Ref. 1.2):

“To ensure that the integrity of the site is maintained and that it makes the best possible contribution to maintaining Favourable Conservation Status (FCS) for Harbour Porpoise in UK waters.

In the context of natural change, this will be achieved by ensuring that:

- 1. Harbour porpoise is a viable component of the site;*
- 2. There is no significant disturbance of the species; and*
- 3. The condition of supporting habitats and processes, and the availability of prey is maintained”.*

~~4.7.7~~1.2.24 These Conservation Objectives are:

“a set of specified objectives that must be met to ensure that the site contributes in the best possible way to achieving Favourable Conservation Status (FCS) of the designated site feature(s) at the national and biogeographic level” (Ref. 1.2).

- i. **Conservation Objective 1: The species is a viable component of the site.**

~~4.7.8~~1.2.25 This Conservation Objective is designed to minimise the risk of injury and killing or other factors that could restrict the survivability and reproductive potential of harbour porpoise using the SAC. Specifically, this objective is primarily concerned with operations that would result in unacceptable levels of those impacts on harbour porpoise using the SAC. Unacceptable levels can be defined as those having an impact on the FCS of the populations of the species in their natural range.

~~4.7.9~~1.2.26 Harbour porpoise are considered to be a *viable component* of the SAC if they are able to live successfully within it. The SNS SAC has been selected primarily based on the long-term, relatively higher densities of porpoise in contrast to other areas of the North Sea. The implication is that the SAC provides relatively good foraging habitat and may also be used for breeding and calving. However, because the number of harbour porpoise using the SAC naturally varies, there is no exact value for the number of animals expected within the site (Ref. 1.2).

~~4.7.10~~1.2.27 Harbour porpoise are listed as EPS under Annex IV of the Habitats Directive, and are therefore protected from the deliberate killing (or injury), capture and disturbance throughout their range. Within the UK, the Habitats Directive is enacted through The Conservation of Habitats and Species Regulations 2017 and the Conservation of Offshore Marine Habitats and Species Regulations 2017. Under these Regulations, it is deemed an offence if harbour porpoise are deliberately disturbed in such a way as to:

~~4.~~1. Impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or

~~2.~~2. To affect significantly the local distribution or abundance of that species.

~~4.7.11~~1.2.28 The term deliberate is defined as any action that is shown to be "by a person who knows, in the light of the relevant legislation that applies to the species involved, and the general information delivered to the public, that his action will most likely lead to an offence against a species, but intends this offence or, if not, consciously accepts the foreseeable results of his action".

~~4.7.12~~1.2.29 In addition, Article 12(4) of the Habitats Directive is concerned with incidental capture and killing. It states that Member States "shall establish a system to monitor the incidental capture and killing of the species listed on Annex IV (all cetaceans). In light of the information gathered, Member States shall take further research or conservation measures as required to ensure that incidental capture and killing does not have a significant negative impact on the species concerned".

ii. Conservation Objective 2: There is no significant disturbance of the species.

~~4.7.13~~1.2.30 The disturbance of harbour porpoise typically, but not exclusively, originates from operations that cause underwater noise, including activities such as seismic surveys, pile driving and sonar. Responses to noise can be physiological and/or behavioural. JNCC ~~has~~et al. have produced

guidelines to minimise the risk of physical injury to cetaceans from various sources of loud, underwater noise (Ref. 1.4)¹. However, disturbance is primarily a behavioural response to noise and may, for example, lead to harbour porpoises being displaced from the affected area.

~~4.7.14~~1.2.31 As outlined above, JNCC and Natural England (Ref. 1.2) note that harbour porpoises in UK waters are considered part of a wider European population and that due to the mobile nature of this species the concept of a 'site population' may not be appropriate for this species. JNCC (Ref. 1.1) therefore advises that assessments of effects of plans or projects (i.e. HRA) need to take into consideration population estimates at the MU level, to account for daily and seasonal movements of the animals.

~~4.7.15~~1.2.32 Disturbance of harbour porpoise may lead to displacement from an area, and the temporary loss of habitat. As such, JNCC and Natural England (Ref. 1.2) suggest that activities within the SNS SAC should be managed to ensure that the animals' potential usage of the site is maintained and any disturbance should not lead to the exclusion of harbour porpoise from a significant portion of the site for a significant period of time.

~~4.7.16~~1.2.33 The current Statutory Nature Conservation Bodies (SNCB) advice and guidance (Ref. 1.4) for the assessment of significant noise disturbance on harbour porpoise in the SNS SAC is that:

"Noise disturbance within an SAC from a plan/project, individually or in-combination, is considered to be significant if it excludes harbour porpoise from more than:

~~1.~~ 1) 20% of the relevant area of the site in any given day, or

~~2.~~ 2) An average of 10% of the relevant area of the site over a season."

iii. Conservation Objective 3: The condition of supporting habitats and processes, and the availability of their prey is maintained.

~~4.7.17~~1.2.34 Supporting habitats, in this context, means the characteristics of the seabed and water column. Supporting processes encompass the movements and physical properties of the habitat. The maintenance of these supporting habitats and processes contributes to ensuring prey is maintained within the SAC and is available to harbour porpoise using the site. Harbour porpoise are strongly reliant on the availability of prey species

¹ <http://jncc.defra.gov.uk/page-4273>

year round due to their high energy demands, and their distribution and condition may strongly reflect the availability and energy density of prey.

~~4.7.18~~1.2.35 This Conservation Objective is designed to ensure that harbour porpoise are able to access food resources year round, and that activities occurring in the SNS SAC will not affect this.

d) Management measures

~~4.7.19~~1.2.36 Specific management measures are yet to be developed for the SNS SAC; however, JNCC and Natural England (Ref. 1.2) advise that "the maintenance of supporting habitats and processes contributes to ensuring that prey is maintained within the site and is available to harbour porpoises using the site."

~~4.7.20~~1.2.37 JNCC and Natural England (Ref. 1.2) also state that "management measures (e.g. the scale and type of mitigation) are the responsibility of the relevant regulatory or management bodies. These bodies will consider SNCB advice and hold discussions with the sector concerned, where appropriate."

~~4.7.21~~1.2.38 In the absence of management measures for the SNS SAC at this time, a range of project-level commitments have been proposed through the development of this draft SIP, ~~MMMP~~the draft MMMP (Doc Ref. 6.3 22N(B)) (secured pursuant to DML Condition 40) and any necessary EPS licencing requirements, to ensure that appropriate mitigation measures (where required) can be agreed to ensure that the Conservation Objectives are met.

e) Advice on activities

~~4.7.22~~1.2.39 JNCC and Natural England (Ref. 1.2) have provided advice on activities that specifically occur within or near to the SNS SAC that could be expected to impact on the site's integrity. The key impacts and activities that JNCC and Natural England consider to have the greatest impact on the population of UK harbour porpoise and, therefore, the SNS SAC are:

- Removal of non-target species by commercial fisheries with by-catch of harbour porpoise (predominantly static nets).
- Increased contaminants from discharge / run-off from land fill, terrestrial and offshore industries.
- Increased anthropogenic underwater noise from shipping, drilling, dredging and disposal, aggregate extraction, pile driving, acoustic surveys, underwater

explosion, military activity, acoustic deterrent devices and recreational boating activity.

- Death or injury by collision from shipping, recreational boating and tidal energy installations.
- Reduction in prey resources by commercial fisheries.

~~1.7.23~~1.2.40 The aim is that the advice should help identify the extent to which existing activities are, or can be made, consistent with the Conservation Objectives, and thereby focus the attention of relevant and competent authorities and monitoring programmes to areas that may need management measures (Ref. 1.2).

2 POTENTIAL EFFECTS: SOUTHERN NORTH SEA SAC

2.1 Potential ~~effects of piling for~~ for significant disturbance of harbour porpoise as a result of underwater noise from the Sizewell C Project (alone)

~~4.1.4.1~~1.2.41 The assessments in the **Shadow HRA Report** (~~Doc Ref. 5.10~~ [APP-145]), concluded that there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise from the Sizewell C Project alone. However underwater noise from the piling of the permanent BLF and temporary MBIF is the activity which could result in the potential disturbance of harbour porpoise. Therefore, it has been assessed as the worst-case in this draft SIP.

~~4.1.4.3~~1.2.42 Since the completion of the **Shadow HRA Report** (~~Doc Ref. 5.10~~ [APP-145]) in early 2020, there have been ~~some~~ updates for the enhanced permanent BLF and the inclusion of the proposed design change for a temporary BLF (as outlined in **Section 1.2**). The assessments in the Shadow HRA Addendum [AS-178] for the enhanced permanent BLF and temporary MBIF concluded that there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise from the Sizewell C Project alone.

f) Effective Deterrence Ranges (EDR)

~~4.1.4.4~~1.2.43 ~~In addition, since~~ Since completion of the **Shadow HRA Report** (~~Doc Ref. 5.10~~ [APP-145]) JNCC *et al.* (Ref. 1.4) ~~have~~ finalised guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs. The guidance identifies noise generating activities that can potentially result in disturbance to harbour porpoise and provides recommended Effective Deterrence Ranges (EDR) for these activities. This includes a recommended 15km EDR for pin piles. ~~Therefore, the~~ The assessments ~~have been updated to take into in the~~ Shadow HRA Addendum [AS-178] for the enhanced permanent BLF and temporary MBIF and the assessments in this draft SIP take into account this guidance and recommended EDR for pin piles.

1.2.44 The potential areas of disturbance for piling at the permanent BLF and temporary MBIF are based on the worst-case piling locations, taking into account overlap of the maximum potential area in the Southern North Sea SAC and proximity to land:

- For piling at the permanent BLF, the maximum area of disturbance in the SNS SAC winter area is 332.5km² (2.62% of the SNS SAC winter area).
- For piling at the temporary MBIF, the maximum area of disturbance in the SNS SAC winter area is 341.1km² (2.69% of the SNS SAC winter area).
- For consecutive piling at permanent BLF and temporary MBIF, the maximum area of disturbance in the SNS SAC winter area is 341.1km² (2.69% of the SNS SAC winter area).
- For concurrent piling at permanent BLF and temporary MBIF, the maximum area of disturbance in the SNS SAC winter area is 341.5km² (2.69% of the SNS SAC winter area).

1.2.45 As outlined in **Section 0**, installation and piling for both the permanent BLF and temporary MBIF will start at the same time:

- Assuming no temporal overlap of piling activities, a total of 60 days piling will be required, based on two piles being installed per day.
- If piling for the permanent BLF and temporary MBIF occurred simultaneously, a total of 54 days of piling will be required.
- If piling for the piers for the permanent BLF and temporary MBIF occurred concurrently a total of 48 days of piling will be required.

1.2.46 As a precautionary approach, it is assumed all piling will be in the winter period (October 2022 to March 2023).

1.2.47 **Table 0.1** provides an assessment of the potential worst-case effects of piling for the Sizewell C Project (alone) for the permanent BLF and temporary MBIF.

1.2.48 The assessments indicate that the worst-case scenario is for piling at the permanent BLF and temporary MBIF (up to 2.69% of SNS SAC winter area) with no temporal overlap in piling (seasonal average of 0.89% for 60 days). Therefore, piling for the permanent BLF and temporary MBIF will not exceed 20% of the winter area on any given day, or exceed an average of 10% of the winter area during the winter season. Therefore, there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise from the Sizewell C Project alone.

~~2.1.1~~ 1.2.49 Hydrohammers, which are proposed to – It is important to note, hydrohammers, which will be used for the piling of the BLFs permanent BLF

and temporary MBIF, ~~may~~will reduce sound exposure levels (SEL) by 3 to 6dB and sound peak pressure level (SPL) by 9 to 12 dB. However, there is currently no EDR for pin-piles with noise reduction methods.

1.2.50 In the latest Underwater Noise Report ([REP5-124]), assessments of fleeing behaviour assumed that marine mammals would flee from the source location at the onset of activity. The maximum potential range for harbour porpoise was less than 9km, based on fleeing response, 24 hour exposure and Temporary Threshold Shift (TTS) threshold. Therefore, the EDR of 15km used in the assessments represents the worst-case.

~~2.1.2 Table 2.1 provides an updated assessment of the potential effects of piling for the Sizewell C Project (alone) for the permanent and temporary BLFs, which shows that there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise from the Sizewell C Project alone.~~

~~Table 2.1: The potential~~ Table 0.1: The potential worst-case effects of piling for the Sizewell C Project on the Southern North Sea SAC (alone)

Potential Effect	Assessment Of Potential Effect On Harbour Porpoise (% of North Sea MU)*	Spatial Assessment In Relation To The SNS SAC Winter Area	Season Average Assessment In Relation To The SNS SAC Winter Area And Winter Season	Potential For Adverse Effect On The Integrity Of The SNS SAC
<u>Piling at the permanent BLF and temporary MBIF – no temporal overlap</u>				
Worst-case (16 days)	202-207 (0.06%)	2.62%(332.5km²) <u>2.69% (341.1km²)</u>	0.230.89% <u>(60 days)</u>	No
Likely scenario (8 days)	202 (0.06%)	2.62% (332.5km²)	0.12%	No
Active piling time (1 day)	202 (0.06%)	2.62% (332.5km²)	0.01%	No
<u>Piling at Consecutive piling at the permanent BLF and temporary BLF MBIF</u>				
Worst-case (110 days)	207 (0.06%)	2.69% (341.1km²)	1.63%	No

Likely scenario (50 days) <u>Worst-case</u>	207 (0.06%)	2.69% (341.1km ²)	0.74 <u>0.80</u> % (54 days)	No
Active piling time (5 days)	207 (0.06%)	2.69% (341.1km ²)	0.07%	No
Consecutive piling at permanent and temporary BLFs				
Worst-case (126 days)	207 (0.06%)	2.69% (341.1km ²)	1.86%	No
Likely scenario (60 days)	207 (0.06%)	2.69% (341.1km ²)	0.89%	No
Active piling time (6 days)	207 (0.06%)	2.69% (341.1km ²)	0.09%	No
Concurrent piling at <u>the</u> permanent <u>BLF</u> and temporary <u>BLFs</u> <u>MBIF</u>				
Worst-case (63 days)	207 (0.06%)	2.69% (341.5km ²)	0.93 <u>0.71</u> % (48 days)	No
Likely scenario (54 days)	207 (0.06%)	2.69% (341.5km ²)	0.80%	No
Active piling time (3 days)	207 (0.06%)	2.69% (341.5km ²)	0.04%	No

* Density of harbour porpoise = 0.607/km², based on SCANS-III (Ref. 2.1) and North Sea MU of 346,601 (Ref. 1.3)

2.2 Potential in-combination effects during piling for the Sizewell C Project

1.2.51 It is assumed, as a worst-case, all piling for the permanent BLF and temporary MBIF for the Sizewell C Project will be in the winter period of October 2022 to March 2023. Potential in-combination effects for activities that could occur in the winter area of the SNS SAC during this period have been determined.

1.2.52 However, as outlined in **Section 1**, the final SIP, which will be submitted prior to piling pursuant to DML Condition 40, will include any updated information on the in-combination effects, based on the latest scheduling of works for other plans and projects.

~~4.1.5~~1.2.53 Since the completion of the **Shadow HRA Report** (~~Doc Ref. 5.10~~ [APP-145]) in early 2020, there have been some changes to the potential plans and projects that could result in in-combination underwater noise effects with Sizewell C Project marine works. This includes the Thanet Extension OWF being refused consent in June 2020 and the decision not being challenged²¹. Therefore, the in-combination assessment has been updated with the removal of the Thanet Extension OWF project.

~~2.2.1~~1.2.54 In addition, ~~since the Shadow HRA Report (Doc Ref. 5.10) was prepared~~, East Anglia ONE North, East Anglia TWO and East Anglia THREE have been combined to form the East Anglia HUB and construction is due commence in 2023. Piling is most likely to start in 2024 ~~and/or summer 2023, at the earliest~~, therefore, no potential for in-combination effects with piling at Sizewell C Project marine works; ~~however in the winter period. However, as a worst-case piling in 2023 or UXO clearance for an offshore wind farm (OWF) has been considered in the worst-case in-combination scenarios.~~

~~4.1.6~~1.2.55 As outlined in **Section 0**, since completion of the **Shadow HRA Report** (~~Doc Ref. 5.10~~ [APP-145]) JNCC *et al.* (Ref. 1.4) have finalised guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs.

~~2.2.2~~1.2.56 The JNCC *et al.* (Ref. 1.4) recommended EDRs are:

- 26km EDR for OWF piling of monopiles, an area of up to 2,124km² (up to 16.7% of SNS SAC winter area);

²¹ <https://group.vattenfall.com/uk/what-we-do/our-projects/vattenfall-in-kent/thanet-extension>

- 15km EDR for pin-pile piling, an area of up to 707km² (up to 5.6% of SNS SAC winter area);
- 15km EDR for OWF piling of monopiles with noise abatement, an area of up to 707km² (up to 5.6% of SNS SAC winter area);
- 15km EDR for conductor piling of oil and gas wells, an area of up to 707km² (up to 5.6% of SNS SAC winter area);
- 12km EDR for seismic surveys, potential area of 452.4km² around the moving vessel (2.5% of SNS SAC winter area); however, JNCC *et al.* (Ref. 2.4.1.4) recommends the daily disturbance footprint should be calculated using the EDR as a 'buffer' around the predicted survey line(s) that can be completed on a single day. For example, a single 10km line in a single day results in 692.4km² of area (5.5% of SNS SAC winter area).
- 5km EDR for high resolution geophysical surveys with sub-bottom profilers, an area of 78.54km² around the moving vessel (0.6% of SNS SAC winter area); and
- 26km EDR for UXO clearance, an area of up to 2,124km² (up to 16.7% of SNS SAC winter area).

2.2.31.2.57 The in-combination assessments take this guidance and recommended EDRs for noise generating activities that could disturb harbour porpoise in the SNS SAC winter area into account. However, as previously outlined ~~it proposed to use~~, a hydrohammer will be used to reduce noise levels during piling of the BLFs, but there is currently no EDR for pin-piles with noise reduction methods.

~~1.1.3 For the Shadow HRA Report (Doc Ref. 5.10), a 26km disturbance range was used as a worst-case for the potential disturbance during piling of the BLF. However, JNCC et al. (Ref. 1.4) recommends an EDR of 15km for pin-piles (e.g. small diameter piles compared to OWF monopiles), not the 26km EDR used in the Shadow HRA. Therefore, this reduces the potential impact area from piling of the BLFs. As outlined in Error! Reference source not found.2.1, the maximum area for concurrent piling at permanent and temporary BLFs in the SNS SAC winter area is 341.5km², compared to 967km² assessed in the Shadow HRA.~~

~~1.1.0 Currently, the proposed piling for the permanent and temporary BLFs could be over a maximum of 126 days. However, the likely worst-case, based on the more realistic two piles per day, is up to 60 days for both BLFs. Therefore, all plans and projects in the winter area of the SNS SAC that could have in-combination effects in winter period of 2022 / 2023 have been screened in (Appendix B), comprising:~~

• ~~OWF piling for East Anglia HUB:~~

- ~~Maximum potential overlap with SNS SAC winter area is 2,124km².~~

• ~~UXO clearance for East Anglia HUB:~~

- ~~Maximum potential overlap with SNS SAC winter area is 2,124km².~~

• ~~Possible operation and maintenance UXO clearance for Galloper Offshore Wind Farm:~~

- ~~Maximum potential overlap with SNS SAC winter area is 2,124km².~~

~~1.1.0 It is highly unlikely that two UXO campaigns and OWF piling of monopiles would be undertaken at the same time in the winter SNS SAC area during the winter period, as the maximum potential area could be up to 6,372km², which could result in disturbance of up to 50.2% of the SNS SAC winter area.~~

1.2.58 As outlined in Section 0, the worst-case scenario for piling of the permanent BLF and temporary MBIF is up to 2.69% (up to 341.5km²) of SNS SAC winter area, with no temporal overlap in piling (seasonal average of 0.89% for 60 days).

~~1.1.4~~1.2.59 Therefore, ~~potential~~ Potential in-combination scenarios have been ~~conducted~~ assessed based on ~~other~~ potential activities that could be undertaken ~~without exceeding 20% of~~ during the winter period in the winter area of the SNS SAC ~~on any given day during the winter period, during:~~ (Table 0.2).

~~APPENDIX A: Piling at permanent BLF—worst case of 16 days and 8 day likely scenario (Table 0.2.2).~~

~~APPENDIX B: Piling at temporary BLF—worst case of 110 days and 50 day likely scenario (032.3).~~

~~APPENDIX C: Consecutive piling at permanent and temporary BLF—worst case of 126 days and 60 day likely scenario (042.4).~~

~~APPENDIX D: Concurrent piling at permanent and temporary BLF—worst case of 63 days and 54 day likely scenario (052.5).~~

2.2.41.2.60 Not all these activities will occur at the same time in the SNS SAC winter area during the permanent BLF and temporary MBIF piling for the Sizewell C Project; these scenarios present the possible worst-case in-combination effects (Table 0.2), without having an adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise.

1.2.61 The in-combination assessments during piling for the permanent BLF and temporary MBIF indicate that the worst-case scenarios would not exceed 20% of the winter area on any given day, or exceed an average of 10% of the winter area during the winter season. Therefore, there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise for potential in-combination effects during piling for the Sizewell C Project.

Table 2.20.2: Potential worst- case in-combination scenarios during piling of the permanent BLF and temporary MBIF for the Sizewell C Project

In-Combination Scenario For Permanent <u>BLF</u> <u>and Temporary BLFs</u>	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLF	Potential For Adverse Effect On Integrity Of The SNS SAC
Piling for the <u>BLF-BLFs</u> (332.5km ² <u>up to 341.5km²</u>) with OWF monopile <u>piling</u> (2,124km ²)	<u>2,456.5km²</u> <u>2,465.5km²</u>	<u>19.3</u> <u>19.4</u> %	1.70% for worst-case of 16 days <u>6.4%</u> (0.85% for likely scenario of <u>8-60</u> days)	No
Piling for the <u>BLF-BLFs</u> (332.5km ² <u>up to 341.5km²</u>) with UXO clearance (2,124km ²)	<u>2,456.5km²</u> <u>2,465.5km²</u>	<u>19.3</u> <u>19.4</u> %	1.70 <u>6.4</u> % for worst-case of 16 days(0.85% for likely scenario of <u>8-60</u> days)	No
Piling for the BLF (332.5km ²) with pin-piles (707km ²)	1.039.5km ²	8.2%	0.72% for worst-case of 16 days (0.36% for likely scenario of 8 days)	No

In-Combination Scenario For Permanent BLF and <u>Temporary BLFs</u>	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLF	Potential For Adverse Effect On Integrity Of The SNS SAC
Piling for the BLF -BLFs (332.5km ² up to 341.5km ²) with <u>pin-piles</u> (707km ²) including conductor piling of oil and gas well (707km ²)	1,039.5km² <u>1,048.5km²</u>	8.2 <u>8.3</u> %	0.72% for worst-case of 16 days <u>2.72%</u> (0.36% for likely scenario of 8-60 days)	No
Piling for the BLF -BLFs (332.5km ² up to 341.5km ²) with OWF monopile <u>piling</u> with noise abatement (707km ²)	1,039.5km² <u>1,048.5km²</u>	8.2 <u>8.3</u> %	0.72% for worst-case of 16 days <u>2.72%</u> (0.36% for likely scenario of 8-60 days)	No
Piling for the BLF -BLFs (332.5km ² up to 341.5km ²) with seismic survey	784.9km² <u>793.9km²</u> (based on area (452.4km ²) around vessel)	6.2 <u>6.3</u> %	0.54% for worst-case of 16 days <u>2.06%</u> (0.27% for likely scenario of 8-60 days)	No
	1,024.9km² <u>1,033.9km²</u> (based on survey area (692.4km ²) in one day)	8.1%	0.71% for worst-case of 16 days <u>2.68%</u> (0.35% for likely scenario of 8-60 days)	No
Piling for the BLF -BLFs (332.5km ² up to 341.5km ²) with geophysical	411.04km² <u>420.04km²</u>	3.2 <u>3.3</u> %	0.28% for worst-case of 16 days <u>1.09%</u> (0.14% for)	No

In-Combination Scenario For Permanent <u>BLF</u> and <u>Temporary BLFs</u>	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLF	Potential For Adverse Effect On Integrity Of The SNS SAC
survey (78.54km ²)			likely scenario of <u>8-60</u> days)	
Piling for the <u>BLF-BLFs</u> (<u>332.5km² up to 341.5km²</u>) with seismic survey (692.4km ²) and pin-piles or conductor piling of oil and gas well or monopile with noise abatement (707km ²)	1,731.9km² <u>1,740.9km²</u>	13.6 <u>13.7</u> %	1.2% for worst-case of 16 days <u>4.52%</u> (0.6% for likely scenario of <u>8-60</u> days)	No
Piling for the <u>BLF-BLFs</u> (<u>332.5km² up to 341.5km²</u>) with seismic survey (692.4km ²) and geophysical survey (78.54km ²) and pin-piles or conductor piling of oil and gas well or monopile with noise abatement (707km ²)	1,810.44km² <u>1,819.44km²</u>	14.3%	1.25% for worst-case of 16 days <u>4.72%</u> (0.63% for likely scenario of <u>8-60</u> days)	No
Piling for the <u>BLF-BLFs</u> (<u>332.5km² up to 341.5km²</u>) with pin-piles (707km ²) and conductor	2,453.5km² <u>2,462.5km²</u>	19.3 <u>19.4</u> %	1.7% for worst-case of 16 days <u>6.39%</u> (0.85% for likely	No

In-Combination Scenario For Permanent <u>BLF</u> and <u>Temporary BLFs</u>	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLF	Potential For Adverse Effect On Integrity Of The SNS SAC
piling of oil and gas well (707km ²) and monopile with noise abatement (707km ²)			scenario of 8-60 days)	

~~*Based on maximum, not average, area of overlap with SNS SAC winter area (12,696km²) and winter period of 182 days from 1st October to 31st March.~~

~~**Table 0.3: Potential in-combination scenarios during piling of the temporary BLF**~~

In-Combination Scenario For Temporary BLF	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLFs	Potential For Adverse Effect On Integrity Of The SNS SAC
Piling for the BLF (341.1km ²) with OWE monopile (2,124km ²)	2,465.1km ²	19.4%	11.74% for worst-case of 110 days (5.33% for likely scenario of 50 days)	No based on most likely scenario of 50 days
Piling for the BLF (341.1km ²) with UXO clearance (2,124km ²)	2,465.1km ²	19.4%	11.74% for worst-case of 110 days (5.33% for likely scenario of 50 days)	No based on most likely scenario of 50 days
Piling for the BLF (341.1km ²) with pin-piles (707km ²)	1,048.1km ²	8.3%	4.99% for worst-case of 110 days (2.27% for likely scenario of 50 days)	No
Piling for the BLF (341.1km ²) with conductor	1,048.1km ²	8.3%	4.99% for worst-case of 110 days	No

In-Combination Scenario-For Temporary-BLF	Maximum Area-Of Potential Disturbance In-SNS-SAC Winter-Area	Percentage-Of SNS-SAC Winter-Area	Seasonal Average* During-Piling For-The-BLFs	Potential-For Adverse Effect-On Integrity-Of The-SNS-SAC
piling-of-oil-and-gas-well (707km ²)			(2.27% for likely scenario of 50 days)	
Piling for the BLF (341.1km ²) with OWE monopile with noise abatement (707km ²)	1,048.1km ²	8.3%	4.99% for worst-case-of 110 days (2.27% for likely scenario of 50 days)	No
Piling for the BLF (341.1km ²) with seismic survey	793.5km ² (based-on-area (452.4km ²) around vessel)	6.3%	3.78% for worst-case-of 110 days (1.72% for likely scenario of 50 days)	No
	1,033.5km ² (based-on-survey area (692.4km ²) in one-day)	8.1%	4.92% for worst-case-of 110 days (2.24% for likely scenario of 50 days)	No
Piling for the BLF (341.1km ²) with geophysical survey (78.54km ²)	419.64km ²	3.2%	2.0% for worst-case-of 110 days (0.91% for likely scenario of 50 days)	No
Piling for the BLF (341.1km ²) with seismic survey (692.4km ²) and pin-piles or conductor piling of oil-and-gas well-or-monopile with noise abatement (707km ²)	1,740.5km ²	13.7%	8.29% for worst-case-of 110 days (3.77% for likely scenario of 50 days)	No
Piling for the BLF (341.1km ²) with seismic	1,819.04km ²	14.3%	8.66% for worst-case-of 110 days	No

In-Combination Scenario For Temporary BLF	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLFs	Potential For Adverse Effect On Integrity Of The SNS SAC
survey (692.4km ²) and geophysical survey (78.54km ²) and pin-piles or conductor piling of oil and gas well or monopile with noise abatement (707km ²)			(3.94% for likely scenario of 50 days)	
Piling for the BLF (341.1km ²) with pin-piles (707km ²) and conductor piling of oil and gas well (707km ²) and monopile with noise abatement (707km ²)	2,462.1km ²	19.4%	11.72% for worst-case of 110 days (5.33% for likely scenario of 50 days)	No based on most likely scenario of 50 days

*Based on maximum, not average, area of overlap with SNS SAC winter area (12,696km²) and winter period of 182 days from 1st October to 31st March.

Table 0.4: Potential in-combination scenarios during consecutive piling of the permanent and temporary BLFs

In-Combination Scenario For Consecutive Piling Of BLFs	Maximum Area Of Potential Disturbance In SNS SAC Winter Area	Percentage Of SNS SAC Winter Area	Seasonal Average* During Piling For The BLFs	Potential For Adverse Effect On Integrity Of The SNS SAC
Piling for the BLF (341.1km ²) with OWE monopile (2,124km ²)	2,465.1km ²	19.4%	13.44% for worst-case of 126 days (6.40% for likely scenario of 60 days)	No based on most likely scenario of 60 days

In-Combination Scenario-For Consecutive Piling-Of BLFs	Maximum Area-Of Potential Disturbance In-SNS-SAC Winter-Area	Percentage-Of SNS-SAC Winter-Area	Seasonal Average* During-Piling For-The-BLFs	Potential-For Adverse Effect-On Integrity-Of The-SNS-SAC
Piling for the BLF (341.1km ²) with UXO clearance (2,124km ²)	2,465.1km ²	19.4%	13.44% for worst-case-of 126 days (6.40% for likely scenario of 60 days)	No based on most likely scenario of 60 days
Piling for the BLF (341.1km ²) with pin-piles (707km ²)	1,048.1km ²	8.3%	5.72% for worst-case-of 126 days (2.72% for likely scenario of 60 days)	No
Piling for the BLF (341.1km ²) with conductor piling of oil and gas well (707km ²)	1,048.1km ²	8.3%	5.72% for worst-case-of 126 days (2.72% for likely scenario of 60 days)	No
Piling for the BLF (341.1km ²) with OWE monopile with noise abatement (707km ²)	1,048.1km ²	8.3%	5.72% for worst-case-of 126 days (2.72% for likely scenario of 60 days)	No
Piling for the BLF (341.1km ²) with seismic survey	793.5km ² (based on area (452.4km ²) around vessel)	6.3%	4.33% for worst-case-of 126 days (2.06% for likely scenario of 60 days)	No
	1,033.5km ² (based on survey area (692.4km ²) in one day)	8.1%	5.64% for worst-case-of 126 days (2.68% for likely scenario of 60 days)	No
Piling for the BLF (341.1km ²) with geophysical survey (78.54km ²)	419.64km ²	3.2%	2.29% for worst-case-of 126 days	No

In-Combination Scenario-For Consecutive Piling-Of BLFs	Maximum Area-Of Potential Disturbance In-SNS-SAC Winter-Area	Percentage-Of SNS-SAC Winter-Area	Seasonal Average* During-Piling For-The-BLFs	Potential-For Adverse Effect-On Integrity-Of The-SNS-SAC
			(1.09% for likely scenario of 60 days)	
Piling for the BLF (341.1km ²) with seismic survey (692.4km ²) and pin-piles or conductor piling of oil and gas well or monopile with noise abatement (707km ²)	1,740.5km ²	13.7%	9.49% for worst-case of 126 days (4.52% for likely scenario of 60 days)	No
Piling for the BLF (341.1km ²) with seismic survey (692.4km ²) and geophysical survey (78.54km ²) and pin-piles or conductor piling of oil and gas well or monopile with noise abatement (707km ²)	1,819.04km ²	14.3%	9.92% for worst-case of 126 days (4.72% for likely scenario of 60 days)	No
Piling for the BLF (341.1km ²) with pin-piles (707km ²) and conductor piling of oil and gas well (707km ²) and monopile with noise abatement (707km ²)	2,462.1km ²	19.4%	13.43% for worst-case of 126 days (6.39% for likely scenario of 60 days)	No based on most likely scenario of 60 days

*Based on maximum, not average, area of overlap with SNS-SAC winter area (12,696km²) and winter period of 182 days from 1st October to 31st March.

Table 0.5: Potential in-combination scenarios during concurrent piling of the permanent and temporary BLFs

In-Combination Scenario For Concurrent Piling Of BLFs	Maximum Area Of Potential Disturbance In SNS-SAC Winter Area	Percentage Of SNS-SAC Winter Area	Seasonal Average* During Piling For The BLFs	Potential For Adverse Effect On Integrity Of The SNS-SAC
Piling for the BLF (341.5km ²) with OWE monopile (2,124km ²)	2,465.5km ²	19.4%	6.72% for worst-case of 63 days (5.76% for likely scenario of 54 days)	No
Piling for the BLF (341.5km ²) with UXO clearance (2,124km ²)	2,465.5km ²	19.4%	6.72% for worst-case of 63 days (5.76% for likely scenario of 54 days)	No
Piling for the BLF (341.5km ²) with pin-piles (707km ²)	1,048.5km ²	8.3%	2.86% for worst-case of 63 days (2.45% for likely scenario of 54 days)	No
Piling for the BLF (341.5km ²) with conductor piling of oil and gas well (707km ²)	1,048.5km ²	8.3%	2.86% for worst-case of 63 days (2.45% for likely scenario of 54 days)	No
Piling for the BLF (341.5km ²) with OWE monopile with noise abatement (707km ²)	1,048.5km ²	8.3%	2.86% for worst-case of 63 days (2.45% for likely scenario of 54 days)	No
Piling for the BLF (341.5km ²) with seismic survey	793.9km ² (based on area (452.4km ²) around vessel)	6.3%	2.16% for worst-case of 63 days (1.86% for likely scenario of 54 days)	No

In-Combination Scenario-For Concurrent Piling-Of BLFs	Maximum Area-Of Potential Disturbance In-SNS-SAC Winter-Area	Percentage-Of SNS-SAC Winter-Area	Seasonal Average* During-Piling For-The-BLFs	Potential-For Adverse Effect-On Integrity-Of The-SNS-SAC
	1,033.9km ² (based-on-survey area (692.4km ²)-in one-day)	8.1%	2.82% for worst-case-of 63-days (2.42% for likely scenario of 54-days)	No
Piling for the BLF (341.5km ²) with geophysical survey (78.54km ²)	420.04km ²	3.3%	1.15% for worst-case-of 63-days (0.98% for likely scenario of 54-days)	No
Piling for the BLF (341.5km ²) with seismic survey (692.4km ²) and pin-piles or conductor-piling of oil-and-gas well-or-monopile with noise abatement (707km ²)	1,740.9km ²	13.7%	4.75% for worst-case-of 63-days (4.07% for likely scenario of 54-days)	No
Piling for the BLF (341.5km ²) with seismic survey (692.4km ²) and geophysical survey (78.54km ²) and pin-piles or conductor-piling of oil-and-gas well-or-monopile with noise abatement (707km ²)	1,819.44km ²	14.3%	4.96% for worst-case-of 63-days (4.25% for likely scenario of 54-days)	No
Piling for the BLF (341.5km ²) with pin-piles (707km ²) and conductor-piling	2,462.5km ²	19.4%	6.71% for worst-case-of 63-days	No

In-Combination Scenario-For Concurrent Piling-Of BLFs	Maximum Area-Of Potential Disturbance In-SNS-SAC Winter-Area	Percentage-Of SNS-SAC Winter-Area	Seasonal Average* During-Piling For-The-BLFs	Potential-For Adverse Effect-On Integrity-Of The-SNS-SAC
of oil-and-gas well (707km ²) and-monopile with-noise abatement (707km ²)			(5.75% for likely-scenario of-54-days)	

*Based on maximum, not average, area of overlap with SNS SAC winter area (12,696km²) and winter period of 182 days from 1st October to 31st March.

3 SIP MITIGATION AND MANAGEMENT

~~3.1.1~~1.2.62 As a worst-case it ~~is~~ has been assumed in the assessments that impact piling ~~would be used, however~~ without any noise reduction, it is proposed to use will be used. However, a hydrohammer will be used to minimise the effects of underwater noise. Hydrohammers may reduce sound exposure levels (SEL) by 3 to 6dB and sound peak pressure level (SPL) by 9 to 12 dB.

~~1.1.15~~1.2.63 The in-combination scenarios assessed in **Section 0** indicate that based on the worst-case ~~and / or likely scenario~~ scenarios for impact piling of the permanent BLF and ~~/ or~~ temporary ~~BLFs~~ MBIF that there is no potential for adverse effect on the integrity of the SNS SAC in relation to the Conservation Objectives for harbour porpoise during piling for the Sizewell C Project. Therefore, no additional mitigation or management measures ~~are~~ will be required.

4 SUMMARY AND CONCLUSION

~~4.1.16~~1.2.64 This Draft SIP shows that the most likely in-combination scenarios, based on impact piling, will not have an adverse effect on the integrity of the SNS SAC (**Section 0**). A hydrohammer will be used to reduce noise levels during piling of the BLFs permanent BLF and temporary MBIF and, as such, no further mitigation measures are will be required during piling of the BLFs permanent BLF and temporary MBIF.

1.2.65 A final updated SIP will be prepared based on this draft SIP and, prior to the commencement of piling associated with the permanent BLF and temporary MBIF will be submitted and approved by the MMO pursuant to the Deemed Marine Licence.

1.2.66 The final SIP will include any updated information on management measures, advice or guidance for the SNS SAC, final design of the project and the in-combination assessment will be revised based on the latest information and scheduling of works for other plans and projects.

1.2.67 The final SIP will be developed in consultation with the MMO and Natural England.

REFERENCES

1. Ref. 1.1 JNCC. SAC Selection Assessment: Southern North Sea. January 2017. Joint Nature Conservation Committee, UK. Available from: <http://jncc.defra.gov.uk/page-7243>. 2017.
2. Ref. 1.2 JNCC and Natural England. Harbour Porpoise (*Phocoena phocoena*) Special Area of Conservation: Southern North Sea Conservation Objectives and Advice on Operations. Advice under Regulation 21 of The Conservation of Offshore Marine Habitats and Species Regulation 2017 and Regulation 37(3) of the Conservation of Habitats and Species Regulations 2017. March 2019.
- ~~Ref. 1.3~~ ~~Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Boerjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M., Scheidat, M. and Teilmann, J. Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. Wageningen Marine Research. 2017.~~
3. Ref. 1.3 IAMMWG. Updated abundance estimates for cetacean Management Units in UK waters. JNCC Report No. 680, JNCC Peterborough, ISSN 0963-8091. 2021. Available from: <https://data.jncc.gov.uk/data/3a401204-aa46-43c8-85b8-5ae42cdd7ff3/JNCC-Report-680-FINAL-WEB.pdf>.
4. Ref. 1.4 JNCC, Department of Agriculture, Environment and Rural Affairs (DAERA) and Natural England. Guidance for assessing the significance of noise disturbance against Conservation Objectives of harbour porpoise SACs (England, Wales & Northern Ireland). June 2020.

~~APPENDIX E: FIGURES~~

APPENDIX F: SZC PILING AND OWE PILING AND UXO DATES

Table B1: Offshore wind farms within 26km of the SNS SAC winter area considered in the in-combination assessments for the potential disturbance of harbour porpoise where there is the potential of UXO or piling occurring at the same time as piling at the SZC BLF(s). All details presented are based on the most up to date information for each project at the time of writing.

Name Of Project	Distance From SNS SAC Winter Area	Possible UXO Dates*	Dates Of Offshore Piling [†]	Potential For UXO During SZC Piling
SZC BLFs Piling	Within SNS SAC Winter Area	N/A	Winter 2022/2023	No
Tier 3: consented				
Dogger Bank A	No overlap with winter area	2021	2022-2023	N/A — no overlap with winter area
Dogger Bank B	No overlap with winter area	2021 or 2022	2023	N/A — no overlap with winter area
Dogger Bank C	No overlap with winter area	2023	2024	N/A — no overlap with winter area
Sofia	Within SNS SAC summer area	2021-2022	Offshore construction to commence in 2023	N/A — no overlap with winter area
East Anglia THREE ³	Within SNS SAC summer area	2022	Offshore construction to commence in 2023 (although piling likely to begin in summer 2023 or 2024)	Yes
Hornsea Project Two	Within SNS SAC summer area	2020	2020-2021	N/A — no overlap with winter area
Triton Knoll phase 1-3	Less than 26km	2019/20	2020	No
Norfolk Vanguard	Within SNS SAC summer area	2023	2024 — 2028	No
Tier 4: application submitted				

Name Of Project	Distance From SNS SAC Winter Area	Possible UXO Dates*	Dates Of Offshore Piling [†]	Potential For UXO During SZC Piling
SZC BLFs Piling	Within SNS SAC Winter Area	N/A	Winter 2022/2023	No
Hornsea Project Three	Less than 26km	2022	Possible piling: 2022-2023 and 2029-2030	N/A — no overlap with winter area
Norfolk Boreas	Within SNS SAC summer area	2024	2025 — 2029	No
East Anglia ONE North	Within SNS SAC summer area	2022	Offshore construction to commence in 2023	Part of East Anglia Hub and same campaign as EA3 above ³
East Anglia TWO	Less than 26km	2022	Offshore construction to commence in 2023	
Tier 5: application in preparation				
Hornsea Project Four	Within SNS SAC summer area	Unknown	Unknown	N/A — no overlap with winter area
Dudgeon and Sheringham Shoal Extensions	Less than 26km	Unknown	Unknown	No
Operation and Maintenance UXO				
Galloper ⁴	Less than 26km	Unknown	Unknown	Yes

*Possible UXO clearance dates assumed to be 1 year before piling, unless other information is available

¹Piling and offshore construction dates are based on the latest dates and information available.

²Most likely worst-case scenario: projects for which consent has been granted (Tier 3 projects), applications have been submitted (Tier 4) and proposed piling is likely to overlap with the proposed piling of SZC.

³The proposed East Anglia Hub, which consists of the East Anglia THREE, East Anglia TWO and East Anglia ONE North offshore wind farms, offshore construction activity, including piling, is proposed to commence in 2023, UXO clearance is assumed to be 2022 and would be one campaign for the three sites or subsequent UXO clearance of the three sites, therefore only potential for one UXO clearance operation at a time.

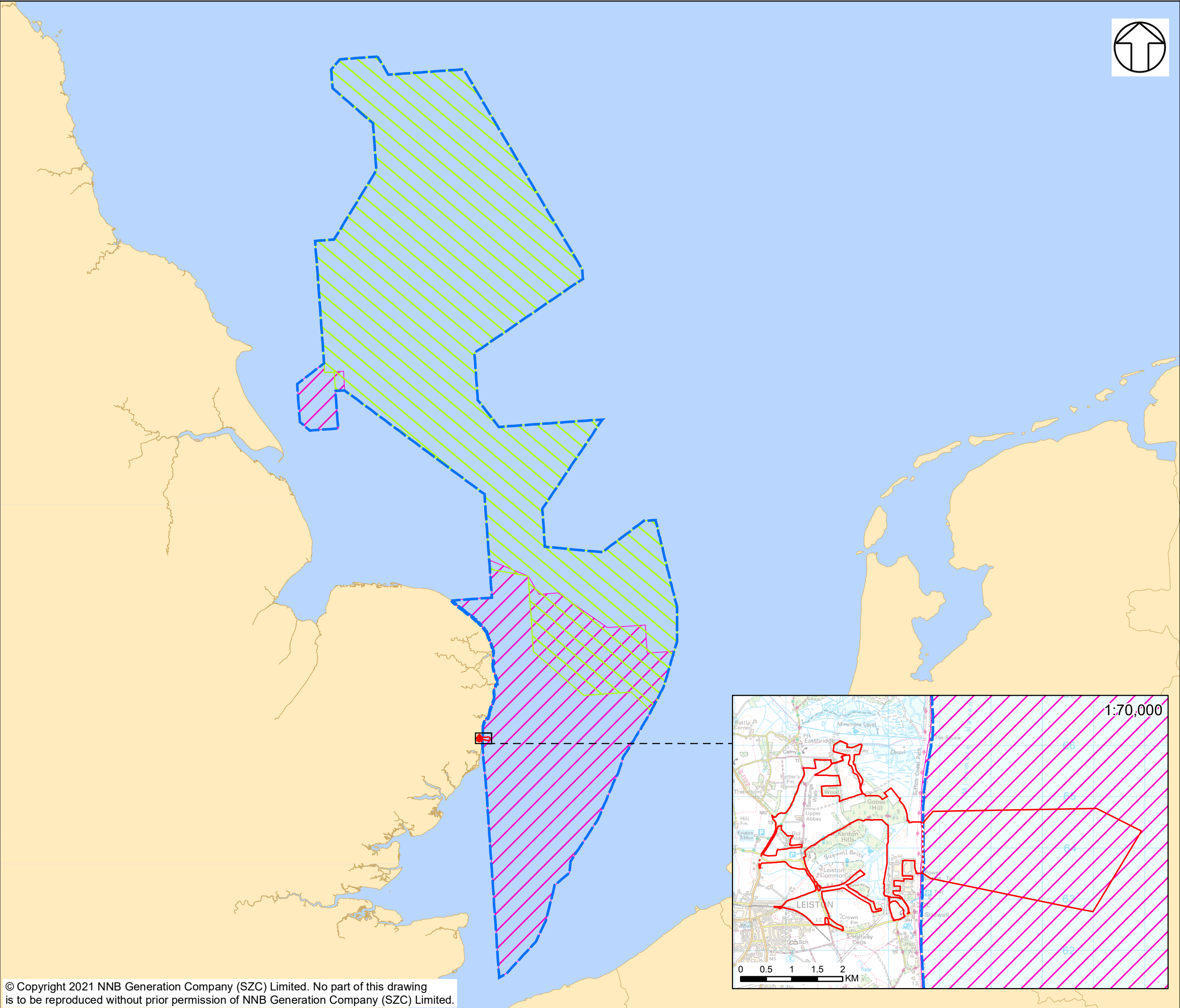
https://www.scottishpowerrenewables.com/pages/east_anglia_timeline.aspx

⁴Galloper Offshore Wind Farm Ltd has applied for a license for any UXO clearance that may be required during operation and maintenance.

5. [Ref. 2.1 Hammond, P.S., Lacey, C., Gilles, A., Viquerat, S., Boerjesson, P., Herr, H., Macleod, K., Ridoux, V., Santos, M.B., Scheidat, M.,](#)

Teilmann, J., Vingada, J. and Øien, N. Estimates of cetacean abundance in European Atlantic waters in summer 2016 from the SCANS-III aerial and shipboard surveys. June 2021. Available from: https://synergy.st-andrews.ac.uk/scans3/files/2021/06/SCANS-III_design-based_estimates_final_report_revised_June_2021.pdf

APPENDIX A: FIGURE 1.1: SIZEWELL C IN RELATION TO THE SOUTHERN NORTH SEA SPECIAL AREA OF CON- SERVATION



NOTES

KEY

- SIZEWELL C MAIN DEVELOPMENT SITE BOUNDARY
- DEMARCATION LINE
- SOUTHERN NORTH SEA SPECIAL AREA OF CONSERVATION (SAC)
- SUMMER AREA
- WINTER AREA

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DOCUMENT:
 SITE INTEGRITY PLAN FOR THE SOUTHERN NORTH SEA SPECIAL AREA OF CONSERVATION

DRAWING TITLE:
 SIZEWELL C IN RELATION TO THE SOUTHERN NORTH SEA SAC WINTER AND SUMMER AREAS

DRAWING NO:
FIGURE 1.1

DATE:	DRAWN:	SCALE:	REVISION:
JAN 2021	J.T.	1:1,900,000 @A3	2.0

SCALE BAR
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 Kilometres