



The Sizewell C Project

6.11 Volume 10 Project-wide, Cumulative and Transboundary Effects

Chapter 5 Transboundary Effects

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Contents

5 Transboundary Effects..... 1

5.1 Introduction..... 1

5.2 Legislation, Policy and Guidance..... 1

5.3 Methodology 5

5.4 EIA Topic Assessments..... 8

5.5 Habitat Regulations Assessment..... 19

5.6 Summary 20

References 21

Tables

None Provided.

Plates

None Provided.

Figures

Figure 5.1: Territorial Waters of Closest European Economic Area States

5 Transboundary Effects

5.1 Introduction

5.1.1 This chapter presents the assessment of transboundary environmental effects associated with the construction and operation of the Sizewell C power station at the main development site and the construction, operation and removal and reinstatement (where applicable) of the associated development sites (hereafter referred to as, the ‘Sizewell C Project’). A description of the anticipated activities for the decommissioning of the Sizewell C power station, including a summary of the types of environmental effects that may occur, is provided in **Chapter 5 of Volume 2** of the Environmental Statement (**ES**).

5.1.2 This chapter and **Appendix 5A** of this volume represents SZC Co.’s fulfilment of the requirements of the Planning Inspectorate’s Advice Note Twelve (Ref. 5.1) through the discussion of likely significant transboundary effects on other European Economic Area States.

5.2 Legislation, Policy and Guidance

5.2.1 In line with policy and guidance, SZC Co. has considered whether the Sizewell C Project is likely to have significant transboundary effects during the construction, operation, and removal and reinstatement phases.

a) International

5.2.2 International legislation or policy relevant to the transboundary effects assessment includes:

- Directive 2014/52/EU Assessment of the Effects of Certain Public and Private Projects on the Environment amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment (‘EIA Directive’) (Ref. 5.2).
- Council Directive 92/43/EEC (Habitats Directive) (Ref. 5.3).
- Council Directive 2009/147/EC (Birds Directive) (Ref. 5.4).
- Convention on Environmental Impact Assessment in a Transboundary Context (Espoo Convention) (Ref. 5.5).

5.2.3 A wide range of activities are listed in Appendix 1 of the Espoo Convention, which includes all thermal power stations with a heat output of 300 megawatts (MW) and all nuclear power stations. Thus it is necessary to consider whether the proposed development is likely to have a significant transboundary effect.

5.2.4 The EIA Directive is transposed into UK legislation by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 5.6) and the Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended) (Ref. 5.7) (referred to collectively as 'the EIA Regulations'), as summarised in a national context below.

5.2.5 The Habitats Directive and Birds Directive require the establishment and protection of sites known as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) in order to ensure the protection of important and endangered habitats and species, and rare, vulnerable and migratory birds. SACs, SPAs, sites in the process of designation as SACs and SPAs, and Ramsar wetlands (under UK policy) are each considered as European sites and are considered as part of the Habitat Regulation Assessment (HRA) process.

b) National

i. Legislation

5.2.6 National legislation relevant to the transboundary effects assessment includes:

- Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 5.6).
- Marine Works (Environmental Impact Assessment) Regulations 2007 (Ref. 5.7).
- The Conservation of Habitats and Species Regulations 2017 (Ref 5.8).
- The Conservation of Offshore Marine Habitats and Species Regulations 2017 (Ref. 5.9).

5.2.7 Regulation 32 of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 5.6) imposes a requirement for all significant transboundary issues set out in the EIA Directive (Ref. 5.2) to be assessed through the EIA process.

- 5.2.8 In England, the requirements of the Habitats Directive and Birds Directive are transposed into domestic law by The Conservation of Habitats and Species Regulations 2017 (Ref. 5.8) (more commonly known as the Habitats Regulations) for European sites within territorial waters (i.e. 12 nautical miles), and The Conservation of Offshore Marine Habitats and Species Regulations 2017 (Ref. 5.9) (the Offshore Habitats Regulations) for European sites within waters beyond 12 nautical miles.
- 5.2.9 The Habitats Regulations require that, before authorising a project likely to have a significant effect on a European site, a competent authority (i.e. the decision maker on any application for development consent) must “*make an appropriate assessment of the implications for that site in view of that site’s conservation objectives*” (regulation 63(1) of the Habitats Regulations). Anyone applying for development consent must therefore provide the competent authority with such information as may reasonably be required “*for the purposes of the assessment or to enable them to determine whether an appropriate assessment is required*” (regulation 63(2)). Information relevant to an appropriate assessment includes any representations (following consultation by the applicant) from statutory nature conservation bodies, both within the UK and in other European countries, and how the applicant has had regard to such feedback.
- 5.2.10 The effects of a plan or project on all European sites must be considered. This includes European sites both within the UK and in other EU countries.
- ii. Policy
- 5.2.11 The NPSs that are relevant to the Sizewell C Project are the Overarching National Policy Statement for Energy (NPS EN-1) (Ref. 5.10) and the National Policy Statement for Nuclear Power Generation (NPS EN-6) (Ref. 5.11). NPS EN-1 and NPS EN-6 were considered by Parliament and formally designated in July 2011. As explained in further detail in the **Planning Statement** (Doc Ref. 8.4), whilst NPS EN-1 and EN-6 do not formally have effect to the Sizewell C DCO application, it is appropriate to treat them as providing the primary policies relevant to the determination of the application.
- 5.2.12 The NPSs set out the Government’s energy policy, the need for new infrastructure and guidance for determining an application for a DCO. The NPSs include specific criteria and issues which should be covered by applicants’ assessments of the effects of their scheme, and how the decision maker should consider these impacts.
- 5.2.13 The National Policy Statement for Nuclear Power Generation (NPS EN-6) (Ref. 5.11) states in paragraph 1.7.4 that “*significant trans-boundary effects*”

arising from the construction of new nuclear power stations are not considered likely. Due to the robustness of the regulatory regime there is a very low probability of an unintended release of radiation, and routine radioactive discharges will be within legally authorised limits.”

c) **Regional**

5.2.14 No regional policies are deemed relevant to the transboundary effects assessment.

d) **Local**

5.2.15 No local policies are deemed relevant to the transboundary effects assessment.

e) **Guidance**

5.2.16 Guidance relevant to the transboundary effects assessment includes:

- Planning Inspectorate’s Advice Note Ten (Ref 5.12); and
- Planning Inspectorate’s Advice Note Twelve (Ref. 5.1).

5.2.17 The Planning Inspectorate’s Advice Note Twelve: Transboundary Impacts and Process (March 2018, version 5) (Ref. 5.12) provides further information on the requirements for the assessment of transboundary effects, and sets out how the Planning Inspectorate will meet its obligations in this regard. Advice Note Twelve states that the applicant is requested to provide information to the Planning Inspectorate to enable a view to be reached as to whether the development in question is likely to have significant transboundary effects on other European Economic Area States. Advice Note Twelve provides specific advice for Nuclear NSIPs and states in paragraph 6.1 that “*Special arrangements will be applied to the transboundary impact process for nuclear electricity generating station NSIPs*”. As described in paragraph 6.2, these arrangements largely apply to the role of the Planning Inspectorate, including that “*each nuclear NSIP will be screened using the long list proforma*”. SZC Co. has completed the long list proforma on behalf of the Planning Inspectorate and included a copy as provided in **Appendix 4A** of this volume. The information provided within the appendix is considered to be sufficient to enable the Planning Inspectorate to fulfil the remainder of their duties as prescribed in section 6 of Advice Note Twelve.

5.2.18 The Planning Inspectorate's Advice Note on HRA relevant to NSIPs (Advice Note Ten) (Ref. 5.12) provides further guidance to applicants in relation to the preparation of an HRA report and the Planning Act 2008 processes relating to HRA. SZC Co. has had regard to Advice Note Ten (Ref. 5.12) in undertaking its HRA.

5.3 Methodology

5.3.1 Transboundary effects have only been considered where the impacts of the Sizewell C Project are likely to extend beyond the United Kingdom (UK) and to Espoo Convention signatory states.

a) Scope of the assessment

5.3.2 The scope of this assessment has been established through a formal EIA scoping process undertaken with the Planning Inspectorate. A request for an EIA Scoping Opinion was initially issued to the Planning Inspectorate in 2014, with an updated request issued in 2019, provided in **Appendix 6A** of **Volume 1** of the **ES**.

5.3.3 The 2019 EIA Scoping Report outlined SZC Co.'s approach to the assessment of transboundary effects associated with the Sizewell C Project. The Scoping Report set out that SZC Co. would complete the transboundary screening matrix as detailed in the Planning Inspectorate Advice Note Twelve and provided as **Appendix 5A** of this volume and present a summary within this chapter.

5.3.4 Comments raised in the EIA Scoping Opinion received in 2014 and 2019 have been taken into account in the development of the topic specific assessment methodologies used throughout **Volumes 2** to **9** of the **ES**. These are detailed in **Volume 1, Appendices 6A** to **6C**.

5.3.5 In the EIA Scoping Opinion, the Planning Inspectorate acknowledged that the 2019 EIA Scoping Report did not indicate whether the Sizewell C Project is likely to have significant transboundary effects. The response requested that the **ES** should identify whether the Sizewell C Project has the potential to result in significant transboundary effects and, if so, which European Economic Area states would be affected.

b) Study Area

5.3.6 As shown on **Figure 5.1**, the nearest Espoo Convention signatory states outside the UK to the Sizewell C Project are Belgium, Netherlands Germany and France. The nearest territorial waters of these states are approximately,

112km (to French territorial waters), 119km (to Belgian territorial waters), 122.5km (to Netherlands territorial waters) and 380km (to German territorial waters) from Sizewell C.

c) [Assessment scenarios](#)

5.3.7 This chapter considers the likely project-wide effects during construction, operation, and removal and reinstatement (where applicable) for the Sizewell C Project. Generally, the assessments have considered the following phases of development:

- Construction assessment scenario which comprises.
- Construction at the main development site, including removal and reinstatement of temporary development at the later stages of construction.
- Construction, operation and removal and reinstatement of temporary associated developments (i.e. northern park and ride, southern park and ride, freight management facility and green rail route).

5.3.8 Operational assessment scenario which comprises:

- Operation of the permanent development at the main development site.
- Operation of permanent associated developments (i.e. two village bypass, Sizewell link road, highway and rail improvements).

d) [Potential environmental impacts](#)

i. [Environmental Impact Assessment](#)

5.3.9 The EIA Regulations require the applicant to consider all of the potential environmental effects of a project and identify those that are likely significant.

5.3.10 As part of the EIA process and through consultation with statutory consultees, each environmental topic has an agreed study area (or zone of influence (ZOI)) within which significant environmental effects could occur. Further details of study areas, ZOIs and the consultation can be found within **Appendix 6D to Appendix 6Y of Volume 1 of the ES**. Therefore, the potential for transboundary impacts has been considered within the technical chapters of **Volumes 2 to 9 of the ES** when identifying resources or receptors likely to be affected by the Sizewell C Project. Where a transboundary effect

is considered likely, an assessment has followed standard assessment methodologies described within **Appendix 6D** to **Appendix 6Y** of **Volume 1** of the **ES**.

5.3.11 A summary of the potential transboundary effects associated with the construction, operation and removal and reinstatement phases (where appropriate) of the Sizewell C Project is provided in **section 5.4** of this chapter.

ii. **Habitat Regulations Assessment**

5.3.12 The HRA process typically follows a four-staged approach.

- Stage 1 Likely Significant Effect Screening: This stage involves the identification of potentially affected European sites and a screening process to determine whether or not there are likely significant effects (LSEs) on the qualifying features of those sites, whether alone or in combination with other plans or projects.
- Stage 2 Appropriate Assessment: If any LSEs are identified, Stage 2 assesses the implications of the project for the affected site, in light of that site's conservation objectives and proposed mitigation, and whether it can be ascertained that the proposal will not adversely affect the integrity of the site.
- Stage 3 Assessment of Alternative Solutions: If it cannot be shown that there will be no adverse effect on the integrity of the European site, Stage 3 considers whether there are alternative solutions. Identifying and examining alternative ways of achieving the objectives of the project to establish whether there are solutions that would avoid, or have a lesser effect, on the European site(s).
- Stage 4 imperative reasons of overriding public interest: Where no alternative solution exists, the next stage of the process is to assess whether the project is necessary for imperative reasons of overriding public interest and, if so, the identification of compensatory measures needed to maintain the overall coherence of the Natura 2000 network.

5.3.13 The **Sizewell C Development Consent Order (DCO) Shadow HRA Report** (Doc Ref 5.10) explains how SZC Co. has approached its HRA and presents the findings of the HRA process for all development within the Sizewell C Project.

5.3.14 In addition to the 2019 EIA Scoping Report and 2019 EIA Scoping Opinion, see **Appendix 6A** and **6B** of **Volume 1** of the **ES**, transboundary consultation has been undertaken by SZC Co. as outlined within the **Shadow HRA Report** (Doc Ref. 5.10).

e) **Assumptions and limitations**

5.3.15 The processes for EIA and HRA are inter-related but represent two distinct environmental assessments, with a common evidence base. Both assessments are referred to and relied upon in this transboundary assessment.

5.3.16 In addition to carrying forward assumptions from the technical assessments presented within **Volumes 2 to 9** of the **ES** and the **HRA**, the following assumptions have been made in this assessment:

- the magnitude of likely impacts are no greater than those described at the Sizewell C Project level in **Chapter 2** of this volume.

5.4 EIA Topic Assessments

5.4.1 As described in **Volume 1, Chapter 6** of the **ES**, the EIA methodology considers whether impacts of the Sizewell C Project would have an effect on any resources or receptors. Assessments broadly consider the magnitude of impacts and value/sensitivity of resources/receptors that could be affected in order to classify effects.

5.4.2 The criteria for the assessment of transboundary effects are the same as the assessment methodology for each of the individual technical assessments presented in **Appendices 6D to 6Y** of **Volume 1** of the **ES**; therefore reference should be made to each technical chapter as relevant. This includes the consideration of sensitive receptors, significance criteria and classification of effects. Therefore, a range of terms is used to report effect classifications where transboundary effects are predicted. As such, it should be noted that the Marine Navigation and Major Accidents and Disasters assessments consider the residual risk of an event occurring and therefore use tolerability to define significance. Further information is provided in **Appendix 6T** and **Appendix 6X** of **Volume 1** of the **ES**. A clear statement is made where no transboundary effects have been identified.

5.4.3 The following section discusses the potential for likely significant transboundary effects associated with the Sizewell C Project that have been identified through the EIA process and are detailed within technical chapters of **Volumes 2 to 9** of the **ES**.

a) Spent Fuel and Radioactive Waste Management

5.4.4 **Volume 2, Chapter 7** of the ES presents an overview of the proposed arrangements for the management of radioactive wastes and spent fuel arising during operation of the Sizewell C power station. The chapter also identifies that potential effects associated with the storage of Low level waste, intermediate level waste and spent fuel are considered within the radiological assessment presented in **Chapter 25 of Volume 2** of the **ES**. As such, the potential transboundary effects associated with the management of spent fuel and radioactive waste are considered as part of the radiological assessment discussed in **Section 5.4s** of this chapter.

b) Conventional Waste

5.4.5 Transboundary effects could occur if wastes were transported beyond UK borders. However, it is anticipated that wastes generated during the construction and operation would be treated within Suffolk and/or east of England, albeit with the possibility that recycled materials could be exported to be manufactured into new products. Transboundary effects on waste management facilities are therefore, **negligible (not significant)**.

5.4.6 **Volume 2, Chapter 8** also considered the potential effects of the Sizewell C Project on the availability of concrete, steel, bitumen and gravel in the UK. The assessment identifies that effects on availability of steel would be major adverse (significant), whilst effects on availability of all other material resources would be negligible to minor adverse (not significant). When considered on an international scale the magnitude of impact on all material resources would be reduced and transboundary effects would be **negligible to minor adverse (not significant)**.

c) Socio-economics

5.4.7 The Sizewell C Project is not predicted to have significant socio-economic effects in any other European Economic Area States during the construction or operation phases due to the distance between the Sizewell C Project and any other European Economic Area States. Therefore, no transboundary effects are predicted during the construction, operation or removal and reinstatement phases of the Sizewell C Project.

d) Transport

5.4.8 The study area for the transport assessment covers parts of the east of Norfolk, extending to Lowestoft in the north, Ipswich to the south and the A140 to the west. The geographic extent of the traffic model has been agreed

with Suffolk County Council. Therefore no transboundary effects are expected during the construction or operational phases of the Sizewell C Project.

e) Noise and Vibration

5.4.9 As described in **Appendix 6G of Volume 1** of the **ES**, the noise and vibration assessment considers the potential for the Sizewell C Project to affect all human receptors and other noise sensitive receptors, including public rights of way, heritage and ecological designations, within 1km of a Sizewell C Project site and affected road network. As the noise and vibration effects from construction, operation and removal and reinstatement (where necessary) activities would be localised to this ZOI, **no transboundary effects** are expected during the construction or operation phases of the Sizewell C Project.

f) Air Quality

5.4.10 Emissions to air from the construction, operation and removal and reinstatement (where necessary) of the Sizewell C Project, would have impacts that are localised to the source of the emissions and would have a negligible effect at locations outside of the main development site. Emissions to air from the transport of materials by sea have been screened out of the assessment based on the scale of additional shipping emissions being too low to be capable of having a perceptible impact at any relevant receptor location. Overall, the contribution to air pollution at the nearest State (states in continental Europe to the east) due to emissions from these potential pathways would be negligible and not significant.

g) LVIA

5.4.11 The ZOI for the landscape and visual impact assessment boundary extends 15km (onshore and offshore) from the boundary of the onshore part of the Sizewell C main development site and up to 2km (onshore only) from associated development sites. However, during construction the ZOI is limited to 2km from the onshore part of the Sizewell C main development site and up to 2km from associated development sites. This has been defined by the anticipated Zone of Theoretical Visibility arising from the operational development, specifically for the main structures. As the geographic extent of the ZOIs does not extend beyond UK borders, no transboundary effects on landscape or visual amenity are expected during the construction or operation phases of the Sizewell C Project.

h) Terrestrial Ecology

5.4.12 Transboundary effects on important ecological features could occur if a project impacts a species which travels between two or more European Economic Area states (for example migration through territorial waters), or where a project impacts a European Site. Effects on migratory fish species are covered within **section 5.4p)** of this chapter when discussing effects on marine ecology. The assessment of impacts on European Sites is provided within **section 5.5** of this chapter. For terrestrial ecological features, migratory bird species/assemblages would be affected by habitat loss and temporary disturbance during construction of the Sizewell C Project. Any transboundary effects on migratory bird species/assemblages are predicted to be negligible to minor adverse and **not significant**.

i) Amenity and Recreation

5.4.13 The assessment of amenity and recreation considers physical changes to resources, changes to the numbers of people using resources, and changes to the amenity experience of people using resources within the agreed ZOIs. The ZOI for the Sizewell C main development site extends 8km (onshore and offshore) from the onshore boundary with all associated development sites considering onshore receptors only. As the geographic extent of the ZOIs do not extend beyond UK borders, there will be no transboundary effects on amenity and recreation resources during the construction or operation phases of the Sizewell C Project.

j) Terrestrial Historic Environment

5.4.14 As potential effects on terrestrial historic environment are limited to terrestrial historic assets within the UK, there will be no transboundary effects on the terrestrial historic environment during the construction or operation phases of the Sizewell C Project.

k) Soils and Agriculture

5.4.15 As potential effects on soils and agriculture could arise through loss of agricultural land and loss of productivity of a land holding, effects would be limited to Sizewell C Project sites and their associated land holdings. As such, there is the potential for transboundary effects associated with landholdings, if part of an affected landholdings is located within another European Economic Area state. However, as the land holdings affected by the Sizewell C Project are all contained within the UK no transboundary effects on soils and agriculture are expected during the construction or operation phases of the Sizewell C Project.

l) Geology and Land Quality

5.4.16 Potential effects on geology and land quality could arise through direct contact, dermal contact, inhalation, ingestion, leaching, migration and discharge of contaminants during the construction and operation of the Sizewell C Project. Through the analysis of potential contamination linkages, the assessment identifies the North Sea as a potential receptor and is considered further within the marine water quality and sediments assessment in **Section 5.4o)** of this chapter. All other receptors considered within the assessment are within UK borders, therefore no transboundary effects on geology and land quality are expected during the construction or operational phases of the Sizewell C Project.

m) Groundwater and Surface Water

5.4.17 Transboundary effects could occur through modification of the flow and quality of groundwater, or surface watercourses, and subsequent discharge to the marine environment. This could be in the form of an altered groundwater flow regime, fluvial morphological changes, or changes in water quality. Management of groundwater and surface water across all project stages has been designed to maintain natural conditions as far as practicable. Assessment shows no effects on groundwater would be seen beyond the development boundary. Fluvial geomorphology effects would also be restricted to within the development boundary. There would, therefore, be no transboundary effects on groundwater and surface water during the construction or operation phases of the Sizewell C Project.

n) Coastal Geomorphology

5.4.18 Effects on coastal geomorphology are localised and would be limited to the Greater Sizewell Bay. The Greater Sizewell Bay is anchored in the north by the Blyth river jetties and in the south by the Thorpeness Headland and underlying erosion-resistant Coralline Crag, which outcrops sub-tidally. The seaward boundary extends to the eastern flank of the Sizewell-Dunwich Bank, to include the spatial extent of the proposed cooling water infrastructure. The landward limit is delineated by the Mean High-Water Springs (MHWS) tidal mark. As Greater Sizewell Bay does not extend beyond UK territorial waters no transboundary effects on coastal geomorphology are expected during the construction or operational phases of the Sizewell C Project.

o) Marine Water Quality and Sediments

5.4.19 Owing to the open coastal system of the Greater Sizewell Bay and the exchange between it and the wider North Sea, the spatial extent of effects on Marine Water Quality and Sediments arising from the Sizewell C Project is dependent on the tidal regime and the transmission and persistence of a pressure.

5.4.20 ZOIs for marine water quality and sediments have been informed by the largest-scale potential impacts associated with the Sizewell C main development site. For the Sizewell C Project, these impacts relate to:

- Results from suspended sediment plume modelling associated with dredging and drilling activities.
- Thermal plume modelling of the in-combination impacts of Sizewell B and Sizewell C cooling water discharges (applying the 2°C mean excess temperature contour at the seabed).
- Chemical plume modelling for operational releases required as part of the cooling water system.

5.4.21 For these topics, detailed modelling has been undertaken in consultation with the relevant statutory consultation bodies (such as the Environment Agency, Natural England and the Marine Management Organisation). This includes Suspended Sediment Concentration (SSC) plume modelling for dredging and disposal activities as well as far-field modelling using internationally recognised hydrodynamic modelling software. Full technical details of these assessments and findings are provided within **Volume 2, Chapter 21** of the **ES**; in summary:

- Marine waters at Sizewell are well mixed such that localised elevations of SSC quickly redistribute and return to background levels.
- Absolute thermal exceedance is constrained to a very small area (<1ha). Modest thermal uplifts (2°C) can extend over instantaneous areas of thousands of hectares at the sea surface within the tidal excursion but this does not extend into the waters of other European Economic Area states.
- For all synthetic compounds released, concentrations rapidly decay in part owing to the well-mixed conditions of the Greater Sizewell Bay.

5.4.22 Based on a complete assessment of the Sizewell C Project and activities that are capable of affecting water quality and sediments, with the implementation of primary and tertiary mitigation measures, as detailed in **Volume 2, Chapter 21** of the **ES**, the environmental assessment undertaken concludes negligible to minor adverse effects which are **not significant**.

5.4.23 Based on the highly precautionary ZOIs which have been used and the subsequent assessments concluding negligible to minor adverse effects, it can be concluded that there are no transboundary effects expected as a result of the Sizewell C Project during the construction or operational phases of the Sizewell C Project.

p) **Marine Ecology**

5.4.24 Effects on marine ecology and fisheries are assessed for a range of receptors which, following consultation, are given the following groupings:

- plankton;
- benthic ecology;
- fish ecology;
- marine mammals;
- indirect and Food Web Effects; and
- fisheries.

5.4.25 A range of pressures have been assessed which were given the following groupings:

- hydrological changes;
- pollution and other chemical changes from sediment resuspension or discharges;
- physical loss;
- physical damage;
- other physical damage (e.g. noise and light); and

- biological pressures.
- 5.4.26 The geographical extent of the marine ecology study area was determined by the potential ZOI for the Sizewell C main development site. The Greater Sizewell Bay forms the initial reference area for marine assessment purposes. The Greater Sizewell Bay extends from Blyth Piers in the north to the Coralline Crag outcrops near Thorpeness in the south. The seaward boundary extends to the eastern flank of the Sizewell-Dunwich Bank, to include the spatial extent of the proposed cooling water infrastructure. The landward limit is delineated by the Mean High Water Springs (MHWS) tidal mark.
- 5.4.27 As noted above for marine water quality and sediments, the Greater Sizewell Bay is an open coastal system and water exchanges between the bay and the rest of the southern North Sea. The spatial extent of potential impacts from the Sizewell C Project is therefore dependent on the tidal regime and the transmission and persistence of the pressure.
- 5.4.28 The ZOI has been informed by the largest-scale potential impacts associated with the Sizewell C main development site, which include:
- results from underwater noise modelling during construction activities (impact pilling, dredging, drilling);
 - results from suspended sediment plume modelling associated with dredging and drilling activities; and
 - thermal plume modelling of the in-combination impacts of Sizewell B and Sizewell C cooling water discharges (applying the 2°C mean excess temperature contour at the seabed).
- 5.4.29 The consultation process identified the need to consider receptor specific effects beyond the ZOI, particularly for highly mobile species. Effects on marine ecological receptors are dependent on the distribution, mobility and ecology of the species being considered relative to the impact. Therefore, assessments will determine the receptor-specific spatial scale within the 'Impact Magnitude' narrative.
- 5.4.30 The boundary of the study area for commercial fisheries was determined to be the International Council for the Exploration of the Sea (ICES) rectangles accounting for the local fishery (ICES rectangle 33F1) and the regional context (ICES rectangles 32F1, 32F2, 33F2, 34F1 and 34F2). The boundary

of the study area for recreational angling from beaches and boats was ICES rectangle 33F1.

- 5.4.31 Applying these study areas and ZOIs, a comprehensive assessment of effects on marine ecology and fisheries was undertaken concluding negligible to minor adverse effects (**not significant**).
- 5.4.32 Some taxa considered within the assessment do interact with other waters around British and other international waters; by way of example, recent studies (BEEMS, 2016m) indicate Smelt from Sizewell and the Rivers Thames, Waveney, and Great Ouse are from one population, with a total range of 300km. It is considered probable that the Smelt originate from a very large population in the River Scheldt in Belgium.
- 5.4.33 Similarly, due to their migratory nature, transboundary effects could occur through effects on Twaite shad originating from the Scheldt estuary, Weser estuary, and Elbe estuary in Germany. Potential effects on Twaite shad are through the physical interaction between species and project infrastructure which includes impingement of the fish. No significant effects on Twaite shad have been identified, thus it is unlikely that significant transboundary effects would exist
- 5.4.34 Whilst there is the potential for species to interact with the Greater Sizewell Bay and other international waters (and therefore other nation states), this is not expected to constitute any form of significant transboundary effect during the construction or operation of the Sizewell C Project. This is owing to the precautionary conclusions of the assessment and the fact that no known species which undertake international passage are dependent on the specific environment of the Greater Sizewell Bay (i.e. any species that interact with the Greater Sizewell Bay as well as international waters are likely to be accompanied by many other species from other environments elsewhere).

q) Marine Historic Environment

- 5.4.35 The geographical extent of the study area for the assessment of effects on the marine historic environment comprises the Sizewell C main development site boundary below mean high water mark and therefore limited to receptors within the UK. No transboundary effects on the marine historic environment are therefore expected during the construction or operation phases of the Sizewell C Project.

r) Marine Navigation

5.4.36 Transboundary effects could occur across national boundaries if Rotterdam is chosen as the transshipment facility base for abnormal indivisible loads (AIL) deliveries, leading to additional vessel movements in the Netherlands. However, due to the low number of vessels involved in AIL deliveries during the construction and operational phases, relative to the number of vessels transiting between Rotterdam and UK ports, any transboundary effects are considered to be negligible (**not significant**). As set out within **Volume 2, Chapter 24** of the **ES**, following the implementation of necessary mitigation, the risk of collision with installation vessels, and the severity of consequence associated with vessel grounding and fishing gear snagging would be tolerable (**not significant**).

s) Radiological

5.4.37 As part of the planned operation of Sizewell C nuclear power station, discharges of low levels of radioactivity will be made to both the atmosphere and marine environment.

5.4.38 **Volume 2, Chapter 25** of the **ES** contains a summary of the radiological effects from the power station. The impacts of radioactive effluent discharges on human and non-human biota from the operation of Sizewell C nuclear power station are very low. As such, based on the international recognised models used in SZC Co.'s assessment, the outputs of which are well below regulatory threshold levels, it can be concluded that there would be **no significant effects** on any Natura 2000 site or other ecological receptor, designated site or representative person.

5.4.39 The radiological effects have been assessed for receptors in the immediate vicinity of the Sizewell C nuclear power station, closest to the source of the radiological discharges, and, as such, are considered to be bounding because as distance increases from the source the concentration in the environment will reduce further. Hence, the equivalent receptors in neighbouring states will incur much lower doses due to the decrease in radioactivity concentrations seen with distance from release. Collective dose results have also been assessed and the risks are minuscule and can be discounted. It is predicted that there will be no transboundary effects from routine releases.

t) Climate Change

i. Greenhouse gases

5.4.40 The receptor for the Greenhouse Gas (GHG) assessment is the global climate. The impact of GHG emissions from the Sizewell C Project are by their nature transboundary.

5.4.41 The assessment considers the contribution of the Sizewell C Project emissions to meeting the UK's carbon budgets during the construction period. This covers the period of the published 3rd, 4th and 5th carbon budgets. There are no recognised carbon budgets outside of the UK for which transboundary effects could be quantified. On this basis, it is assumed that, on a worst case basis, the effects described in **Volume 2, Chapter 26**, would be considered to be of low magnitude and minor adverse at a transboundary level.

ii. In-combination climate change impacts

5.4.42 The in-combination climate change impacts (ICCI) assessment considers the combined impact of climate change and the Sizewell C Project on receptors in the surrounding environment. The assessments detailed within the technical chapters of **Volumes 2 to 9** of the **ES** and the summaries provided for each technical discipline within **section 5.4** of this chapter consider ICCL.

u) Major Accidents and Disasters

5.4.43 By definition, unmitigated MA&D hazards and threats could result in significant environmental effects and may result in transboundary effects. Following the implementation of the identified mitigation (including compliance with legislative and regulatory processes, as set out in **Volume 2, Chapter 27** of the **ES**, all risks including any potential transboundary effects are considered to be tolerable or tolerable if as low as reasonably practicable and **not significant**.

v) Health and Wellbeing

5.4.44 Changes in environmental health determinants with the potential to impact health and wellbeing (air quality and noise in particular) would be relatively localised to the source. While changes in transport nature/flow rate and employment would have a wider sphere of influence, this would not extend any other European Economic Area States during the construction or operation phases due to the distance between the Sizewell C Project and any other European Economic Area States.

- 5.4.45 As a result, no associated transboundary effects on health and wellbeing are expected during the construction or operation phases of the Sizewell C Project.
- 5.5 **Habitat Regulations Assessment**
- 5.5.1 At the scoping stage, SZC Co. identified a potential pathway for effects on European sites within the UK. Following consultation on the HRA Stage 1 screening assessment, it was concluded that there was a potential for LSEs on European sites in Belgium and Germany. As such, these were carried forward to the HRA Stage 2 appropriate assessment, as potential LSEs could not be excluded.
- 5.5.2 Details of these European sites, together with details of their qualifying features, can be found in the appendices to the DCO **Shadow HRA report** (Doc Ref. 5.10). Many of these European sites are distant from the Sizewell C Project and are being considered because of the presence of migratory fish that have the potential to interact with the zone of influence of the Sizewell C Project (specifically the potential for impingement and entrainment).
- 5.5.3 In accordance with the Planning Inspectorate’s Advice Note Ten, a screening matrix for potential transboundary effects has been undertaken, for migratory fish, identified during consultation at the HRA Stage 1 screening assessment stage. The screening matrices are based on the assessment of effects and consultation with relevant statutory and non-statutory bodies (see Appendix B of Document Ref. 5.10).
- 5.5.4 Stage 2 of the assessment concluded that for all European sites with migratory fish as qualifying features (river lamprey, sea lamprey and twaite shad), the construction and operation of the Sizewell C Project will not have an adverse effect on the integrity of these European sites.
- 5.5.5 Stage 2 of the HRA further assessed all LSEs identified at Stage 1. This concluded that an adverse effect on integrity could not be excluded for the Minsmere-Walberswick SPA and Ramsar site due to noise and visual disturbance on the breeding marsh harrier qualifying interest feature during the construction phase. Adverse effect on integrity can be excluded for all other European sites, including within other European Economic Area states.
- 5.5.6 Full details of the HRA process and its findings are reported in the **Shadow HRA report** (Doc Ref. 5.10).

5.6 Summary

5.6.1 Potential transboundary effects have been considered for individual topic areas, which are described within this chapter, based upon available information and professional judgement. The **ES** details the assessment for each topic area and for each of the developments associated with the Sizewell C Project. The potential for transboundary effects (i.e. effects predicted outside of UK territory) is considered for each topic, and conclusions are made as to whether or not any significant transboundary effects are likely. LSEs have also been considered in the HRA, including the potential for significant transboundary effects.

5.6.2 As a result of the Sizewell C Project it is predicted that there will be no significant transboundary effects.

References

- 5.1 Planning Inspectorate (PINS) (2018), Advice Note Twelve: Transboundary Impacts and Process.
- 5.2 European Commission (EC) (2014), Directive 2014/52/EU Assessment of the Effects of Certain Public and Private Projects on the Environment ('EIA Directive').
- 5.3 EC (1992), Council Directive 92/43/EEC (Habitats Directive).
- 5.4 EC (2009), Council Directive 2009/147/EC (Birds Directive).
- 5.5 Convention on Environmental Impact Assessment in a Transboundary Context (Espoo (EIA) Convention) (1997), updated in 2017.
- 5.6 Her Majesties Stationary Office (2017) Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- 5.7 HMSO (2007) Marine Works (Environmental Impact Assessment) Regulations 2007 (as amended).
- 5.8 HMSO (2017) The Conservation of Habitats and Species Regulations 2017.
- 5.9 HMSO (2017) The Conservation of Offshore Marine Habitats and Species Regulations 2017.
- 5.10 Department of Energy and Climate Change. Overarching National Policy Statement (NPS) for Energy (NPS EN-1), 2011. (Online) Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf [Accessed July 2019].
- 5.11 Department for Energy and Climate Change (DECC) (2011) National Policy Statement for Nuclear Power Generation (NPS EN-6) <https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure> [Accessed July 2019].
- 5.12 PINS (2017) Advice Note Ten: Habitats Regulations Assessment relevant to nationally significant infrastructure projects.