

Vattenfall Wind Power Ltd Thanet Extension Offshore Wind Farm

Environmental Statement Volume 2

Chapter 14: Inter-relationships

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Vattenfall Wind Power Ltd
Thanet Extension Offshore Wind Farm
Volume 2
Chapter 14: Inter-relationships
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14 Inter-relationships

14.1 Introduction

- 14.1.1 This chapter of the Environmental Statement (ES) summarises the assessment of inter-related effects across the physical, biological and human environments during the construction, Operation and Maintenance (O&M) and decommissioning phases of the project.
- 14.1.2 Inter-relationships can be defined as multiple effects on the same receptor arising from the development of the Thanet Extension Offshore Wind Farm (Thanet Extension). These occur where a number of separate effects such as habitat loss and increased suspended sediment concentration affect a single receptor, for example; or where a bat species could be affected by a loss of foraging habitat, disturbance due to noise, and disturbance due to lighting impacts at construction sites, leading to an additive effect beyond that described for each individual effect considered.
- 14.1.3 The individual chapters for the offshore and onshore topics have each identified the potential environmental impacts arising from the proposed development in respect of specific environmental parameters. These chapters have also been structured so as to identify and assess the potential for inter-relationships and any associated inter-related effects that may result.

14.2 Statutory and policy context

- 14.2.1 The Environmental Impact Assessment (EIA) Directive (Council Directive 85/337/EEC of 27th June 1985 on the assessment of the effects of certain public and private projects on the environment) requires that inter-relationships be considered. Annex III of the EIA Directive states that an Environmental Statement (ES) should include:
- “A description of the aspects of the environment likely to be significantly affected by the proposed project, including, in particular, population, fauna, flora, soil, water, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship between the above factors”.*
- 14.2.2 Guidance on the issues to be assessed for offshore renewable energy developments is contained in Overarching National Policy Statement (NPS) for Energy (NPS EN-1; DECC, 2011a), the NPS for Renewable Energy Infrastructure (NPS EN-3; DECC, 2011b), the NPS for Electricity Networks Infrastructure (NPS EN-5; DECC, 2011c), and the Marine Policy Statement (MPS; HM Government, 2011).
- 14.2.3 This chapter of the ES has been compiled following advice from The Planning Inspectorate (PINS) on the need to ensure that inter-related effects are fully addressed in any ES accompanying a DCO application. This advice was outlined in Advice Note 9 issued by PINS in April 2012 (PINS, 2012), which states:

“The Environmental Statement should not be a series of separate unrelated topic reports. The interrelationship between aspects of the proposed development should be assessed and careful consideration should be given by the developer to explain how interrelationships have been assessed in order to address the environmental impacts of the proposal as a whole. It need not necessarily follow that the maximum adverse impact in terms of any one topic impact would automatically result in the maximum potential impact when a number of topic impacts are considered collectively. In addition, individual impacts may not be significant but could become significant when their inter-relationship is assessed. It will be for the developer to demonstrate that the likely significant impacts of the project have been properly assessed.”

- 14.2.4 Section 4.2.6 of NPS EN-1 also states that:

“the Infrastructure Planning Commission (IPC) [now the Secretary of State (SoS)] should consider how the accumulation of, and interrelationship between, effects might affect the environment, economy and community as a whole, even though they may be acceptable when considered in an individual basis with mitigation measures in place.”

14.3 Consultation and Scoping

- 14.3.1 As part of the Environmental Impact Assessment (EIA) process, a number of consultations have been undertaken with various statutory and non-statutory authorities. A formal scoping opinion was sought from PINS following submission of the Scoping Report (VWPL, 2016). Ongoing consultation post-scoping has been important in the evolution of the project and the parameters for assessment.
- 14.3.2 Further information on the scoping process for the proposed development is detailed in the Scoping Report (VWPL, 2016) that was submitted to PINS, and in the formal Scoping Opinion (PINS, 2017) received from PINS. Following the submission of the preliminary environmental information Report (PEIR), comments were received as part of the Section 42 (S42) consultation.
- 14.3.3 Table 14.1 summarises the key items of relevance to the inter-relationships assessment that have been raised by consultees during Scoping and S42 conducted to date and provides cross-references to the section within this chapter, or other chapters as appropriate, where the ES addresses each issue.

Table 14.1: Summary of the consultation relating to inter-relationships during the Scoping Opinion and S42 consultation periods

Date and Consultation phase/ type	Consultation and key issues raised	Section where comment addressed
Scoping Opinion	Inter-relationships between topic areas (as described in Sections 2.16 and 4.4 of the Scoping Report). In order to present an assessment of such effects in a meaningful and clear manner, the Applicant is encouraged to present these in the form of a standalone summary chapter for offshore and onshore topic areas respectively but also expects that consideration of these effects is given as part of the topic chapters themselves. The SoS expects that the inter-related effects between relevant onshore and offshore considerations and vice-versa will also be considered. The way that the Applicant has presented the approach in Tables 2.27 and 3.26 of the Scoping Report implies that consideration and assessment would be limited to inter-relationships between onshore topics and offshore topics in isolation.	This chapter presents a summary of the inter-related effects assessment. Inter-relationships for offshore and onshore topics are presented in Section 14.6.
January 2018 S42 Consultation MMO	The chalk reef assessment undertaken in the characterisation report (Volume 4, Annex 5-3: MCZ Assessment (Document Ref: 6.4.5.3) is not appropriate for bedrock such as chalk reef. The classifications used by Irving and Limpenny relate to cobble/stony reef. None of the criteria used to assess 'reefiness' are appropriate for chalk reef. The video images indicate that chalk bedrock is present, therefore the MMO considers no further assessment is required.	Noted. No further assessment has been undertaken.
January 2018 S42 Consultation MMO	However, as has been noted throughout the response, there do remain a number of areas where the MMO seeks clarity from the applicant. These areas must be addressed in any ensuing ES and the MMO would welcome engagement from the applicant to ensure that all environmental information and assessment is appropriate for the project.	An Evidence Plan meeting was held to clarify numerous areas and Section 42 comments, see Document Ref: 8.5 for further details.

14.4 Approach and methodology

- 14.4.1 This assessment of inter-related effects considers only those effects as a result of Thanet Extension and not from other projects (which are considered via the cumulative effects assessment process). The approach to inter-relationships has been developed with specific regard to the guidance referred to in paragraphs 14.2.1 *et seq.*
- 14.4.2 The assessment of potential inter-related effects considers receptor-led effects through an assessment of the scope for all effects to interact, both spatially and temporally, to create inter-related impacts on a receptor (for example all effects on a given receptor such as a user of a public right of way who may be subject to noise, dust and visual effects arising from construction activities). such effects may be short-term, temporary or transient effects or incorporate longer term effects over the lifetime of the project.
- 14.4.3 The approach adopted for Thanet Extension initially includes consideration of inter-dependencies for each topic, where one topic draws upon the findings of another in order to complete an assessment. To illustrate, the assessment of effects on fish and shellfish ecology (Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)) has drawn upon information from the marine physical processes chapter (Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)) in order to identify increases in suspended sediment concentration (SSC) and associated sediment deposition in order to assess effects on fish and shellfish ecology arising from the project. In this way, many of the inter-related effects are intrinsic to the assessments undertaken. Where relevant, this aspect is covered within each chapter, with specific attention drawn to other topic assessments upon which it relies.
- 14.4.4 The secondary step, which is presented in this chapter, then draws upon the detail presented in the individual topic chapters, providing a consideration of each assessment finding from the entire ES to assess the potential for more than one impact to give rise to an additive effect on a given receptor that is only apparent when the potential for interaction between individual impacts on the same receptor is specifically evaluated.
- 14.4.5 To this end, the Thanet Extension inter-relationships assessment presented in this chapter uses a series of tables to list individual effects on key receptors and then provides a descriptive assessment of the scope for these individual assessment chapters to describe potential additional effects that may be of greater significance than the individual effects acting in isolation on a given receptor.

14.4.6 Inter-relationships are therefore considered to be the impacts and associated effects of different aspects of the proposed development on the same receptor. These are considered to be:

- **Project lifetime effects:** Assessment of the scope for effects that occur throughout more than one phase of the project (construction, O&M, decommissioning) to interact to potentially create a more significant effect on a receptor than if just assessed in isolation in the three project phases; and
- **Receptor led effects:** Assessment of the scope for all effects to interact, spatially and temporally, to create inter-related effects on a receptor to produce a different, or greater effect on a receptor than when the effects are considered in isolation. Receptor led effects may be short-term, temporary or transient effects, or incorporate long-term effects.

14.4.7 The approach can be summarised via the following key steps:

- Identification of relevant receptors from the effects sections of assessments undertaken for individual topic areas;
- Identification of the impact source pathways that can affect the receptor and identification of the ES chapter where those pathways are described and assessed;
- Identification of potential effects on these receptor groups via review of assessment sections across all relevant topics; and
- Assessment of inter-relationships utilising tables that list all potential effects on a selected receptor in construction, O&M and decommissioning phases.

14.4.8 As an example of potential inter-related effects, text within the fish and shellfish chapter (Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)) may consider changes in SSC as described in the physical processes chapter (Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)) and also the potential change in prey that may be experienced by higher trophic levels such as marine mammals (Volume 2, Chapter 7: Marine Mammals (Document Ref: 6.2.7)) or commercial fisheries (Volume 2, Chapter 9: Commercial Fisheries (Document Ref: 6.2.9)).

14.4.9 The assessment of inter-related effects considers only those impacts assessed as part of the individual receptor chapters (i.e. any impacts that have been scoped out during EIA scoping have not been considered) and also takes into account only the predicted, combined and residual impacts as they relate to individual receptors. The maximum adverse scenarios are those applied to the individual topic assessments (as set out in each of the relevant chapters of the ES). This allows consistency and traceability within the assessment process, however it should be noted that this typically results in an overly-conservative assessment. In practice, potential inter-related effects may never occur together as a consequence of their spatial and temporal variability (where relevant this is highlighted).

14.4.10 When considering the potential for impacts to inter-relate, it has been assumed that any residual impact determined as having 'no impact' will not result in an inter-relationship when combined with other impacts on receptors. This is of relevance as although the matrix approach presented in Volume 1, Chapter 3: EIA Methodology (Document Ref: 6.1.3) does not include a significance of 'no impact' (negligible being the least significant), a number of potential impacts have been scoped out during EIA scoping due to there being no pathway for potential impacts. These potential impacts therefore do not require any further consideration as part of the inter-related effects assessment. Where this is the case, this have been highlighted within this chapter.

14.4.11 Where a series of negligible residual impacts are identified, these have been considered further. This method ensures consistency in line with the purpose of the EIA regulations in the identification of significant impacts, and in keeping with PINS guidance on the need to consider if a series of individual impacts may become significant when their inter-relationship is assessed. The potential inter-related effects considered in this chapter are limited to the study areas set out in the relevant chapters as these have been determined on the basis of a potential zone of influence for impacts arising and the locations of potentially sensitive receptors.

14.5 Scope for the inter-related effects

14.5.1 All ES chapters have included a consideration of inter-related effects and, as noted above, many of the individual topic chapters within the ES have already addressed elements of the inter-related effects by their nature so as to ensure that the ES is not a series of unrelated topic reports. This holistic approach ensures that the EIA is comprehensive and assesses all relevant potential effects upon all receptors. By way of example, the benthic ecology assessment (Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5)) addresses effects upon the benthos arising from changes to the physical environment (as set out in Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)).

14.5.2 This chapter on inter-relationships therefore summarises the consideration of inter-related effects already set out in the preceding, topic-specific chapters but also, where appropriate, provides details of potential inter-related effects. Given the nature of the proposed development and the consultation that has already been undertaken, there are a number of cases where potential impacts upon receptors have been scoped out during the EIA scoping phase and therefore do not require any further consideration (for further detail see the relevant topic-specific chapters).

14.5.3 A list of topics excluded from the inter-related effects assessment together with the rationale for their exclusion, is presented in Table 14.2.

Table 14.2: Topics scoped out of inter-related effects assessment with rationale

Topic	Rationale for exclusion from further inter-related effect assessment
Marine Geology, Oceanography and Physical Processes (Volume 2, Chapter 2) (Document Ref: 6.2.2)	<p>The effects on marine physical processes considered in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) are inter-related in their nature; in particular, sediment transport is dependent on the currents and waves and therefore these linked processes have already been considered within the assessment. In turn, the information on changes to the marine physical environment has been used to inform other topic areas such as benthic ecology, and fish and shellfish ecology.</p> <p>Assessments have been undertaken in consideration of potential effects upon the marine physical environment within these individual topic chapters. As the consideration of inter-related effects is an inherent part of the assessment undertaken within Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2), and on the basis that inter-related effects associated with relevant receptors are considered in the relevant topic specific chapters, the marine physical environmental has been excluded from further inter-related effects assessment.</p>
Offshore Ornithology (Volume 2, Chapter 4) (Document Ref: 6.2.4)	<p>The potential inter-related effects that could arise between project activities are those that have effect pathways that operate through food chains. Such inter-relationships have already been addressed within Volume 2, Chapter 4: Offshore Ornithology (Document Ref: 6.2.4) as ‘indirect effects’.</p> <p>Based on the assessment presented in Volume 2, Chapter 4: Offshore Ornithology (Document Ref: 6.2.4) and in consideration that any additional inter-relationships have already been incorporated into the assessment of potential impacts on Offshore Ornithology, this topic has been excluded from further inter-related effects assessment.</p>
Offshore Designated Sites (Volume 2, Chapter 8) (Document Ref: 6.2.8)	<p>The assessment of inter-related effects is central to the assessment of potential effects on the integrity of designated sites and, as such, has already been assessed within Volume 2, Chapter 8: Designated sites (Document Ref: 6.2.8). No additional levels of effect are therefore considered to occur at the site level beyond those identified in the specific assessment in Volume 2, Chapter 8: Designated sites (Document Ref: 6.2.8).</p>

Topic	Rationale for exclusion from further inter-related effect assessment
Infrastructure and Other Users (Volume 2, Chapter 11) (Document Ref: 6.2.11)	<p>The assessment presented in Volume 2, Chapter 11: Infrastructure and Other Users (Document Ref: 6.2.11) considers all potential effects on other marine users that could arise from the proposed development, drawing on other topic assessments, for example Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2), and Volume 2, Chapter 10: Shipping and Navigation (Document Ref: 6.2.10), to ensure a robust assessment of all potential impacts on individual user groups has been completed. In this way, the assessment presented in Volume 2, Chapter 11: Infrastructure and Other Users (Document Ref: 6.2.11) already provides for the assessment of inter-related effects.</p>
Commercial Fisheries (Volume 2, Chapter 9) (Document Ref: 6.2.9)	<p>Inter-related effects on commercial fisheries receptors are considered with respect to Volume 2, Chapter 10: Shipping and Navigation (Document Ref: 6.2.10) and Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6). The Commercial Fisheries chapter identified no inter-relationships where an accumulation of residual impacts on commercial fisheries give rise to a need for additional mitigation.</p> <p>An assessment of the inter-related effects on shipping and navigation receptors is an inherent part of the formal Navigation Risk Assessment (NRA) undertaken for the project and summarised in Volume 2, Chapter 10: Shipping and Navigation (Document Ref: 6.2.10), which also assesses the potential impact of construction vessels interacting with fishing vessels. It concluded that effects would be Minor to Tolerable.</p> <p>Shipping and Navigation has also been excluded from further inter-related effects assessment, and as a result, Commercial Fisheries is not considered further in the inter-related effects assessment.</p>
Shipping and Navigation (Volume 2, Chapter 10) (Document Ref: 6.2.10)	<p>An assessment of inter-related effects on Shipping and Navigation is an inherent part of the formal Navigation Risk Assessment (NRA) undertaken for the Project and summarised in Volume 2, Chapter 10: Shipping and Navigation (Document Ref: 6.2.10). The chapter identified that the key inter-relationship would be with Commercial Fisheries, which identified no inter-relationships where an accumulation of residual impacts on commercial fisheries give rise to a need for additional mitigation.</p> <p>As commercial fisheries has been excluded from further inter-related effects assessment, Shipping and Navigation is not considered further in the inter-related effects assessment.</p>

Topic	Rationale for exclusion from further inter-related effect assessment
Socio-economics (Volume 3, Chapter 3) (Document Ref: 6.3.3)	A consideration of inter-related effects is given in within the Socio-Economics chapter and inter-relationships are not considered further within this chapter.
Tourism and Recreation (Volume 3, Chapter 4) (Document Ref: 6.3.4)	A summary of inter-related effects is given within the Tourism and Recreation chapter and inter-relationships are not considered further within this chapter.
Air Quality (Volume 3, Chapter 9) (Document Ref: 6.3.9)	As above, the assessment of air quality given in Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9) includes consideration of the likelihood of air quality effects associated with traffic and transport. The conclusion of that assessment was that the overall effect on air quality was not significant, with no further inter-related effects anticipated.
Ground Conditions, Flood Risk and Land Use (Volume 3, Chapter 6) (Document Ref: 6.3.6)	The assessment given in Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6) includes a consideration of likely inter-related effects and concluded that there would not be any significant inter-relationships, provided that standard mitigation measures to mitigate effects to air quality, noise and vibration and terrestrial ecology are followed.
Onshore Historic Environment (Volume 3, Chapter 7) (Document Ref: 6.3.7)	A consideration of inter-related effects on heritage assets was given within Volume 3, Chapter 7: Onshore Historic Environment (Document Ref: 6.3.7). It concluded that any effects on biodiversity from the loss of archaeological remains that also function as wildlife habitat would be mitigated or offset. Any adverse effects arising from a change in valued views would not constitute an inter-related effect as this is already considered within the historic environment assessment. Therefore, no inter-related effects are predicted for the onshore historic environment.

Topic	Rationale for exclusion from further inter-related effect assessment
Traffic and Transport (Volume 3, Chapter 8) (Document Ref: 6.3.8)	An assessment of inter-related on traffic and transport is an inherent part of the approach undertaken within the topic chapter (Volume 3, Chapter 8: Traffic and Transport (Document Ref: 6.3.8)). The assessment formed the basis for the consideration of effects in relation to traffic in the noise and vibration (Volume 3, Chapter 10: Noise and Vibration (Document Ref: 6.3.10)) and air quality (Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9)) chapters. The conclusion of that assessment was that any effects from increases in traffic and transport would be negligible. No further inter-related effects are considered likely to occur.
Aviation and Radar (Volume 3, Chapter 11) (Document Ref: 6.3.11)	Inter-relationships were considered within Volume 3, Chapter 11: Aviation and Radar (Document Ref: 6.3.11) and no inter-related effects were identified.

14.6 Assessment of inter-related effects

The assessment of inter-related effects therefore considers the following receptors, which are assessed in Table 14.3 to Table 14.11:

- Benthic Subtidal and Intertidal Ecology;
- Fish and Shellfish Ecology;
- Marine Mammal Ecology;
- Offshore Archaeology and Cultural Heritage;
- Seascape, landscape and visual; and
- Water Quality and Sediment Quality.
- Biodiversity;
- Onshore Landscape and Visual Impact Assessment (LVIA); and
- Noise and Vibration.

Table 14.3: Inter-related effect assessment – Benthic subtidal and intertidal ecology

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M, decommissioning.	Temporary habitat disturbance from construction and maintenance activities.	Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5)	The assessment of this potential impact undertaken in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5) concluded that any impacts would be of Minor adverse significance	When habitat loss or disturbance is considered additively across all phases, although the total area of habitat affected is larger, the habitats affected are widespread. Furthermore, all benthic habitats are predicted to recover to the baseline condition within 2 to 10 years. Therefore, across the project lifetime, the effects on benthic ecology receptors are not anticipated to in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.
Construction, decommissioning	Indirect impacts to benthic ecology as a result of the temporary increase in SSC and sediment deposition.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment of this potential impact undertaken in Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2) concluded that any impacts would be of Minor adverse significance.	The majority of the seabed disturbance (resulting in the highest SSC and sediment deposition) will occur during the construction and decommissioning phases, with any effects being short-lived. Due to this, and the recoverability of the species and habitats affected, the interaction of these impacts across all stages of the development is not predicted to result in an effect of any greater significance than those assessed in the individual project phases.
Construction	Impacts to benthic ecology from underwater noise.	Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5)	The assessment of this potential impact undertaken in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5) concluded that any impacts would not be significant.	As this impact is not predicted to be significant, there is very limited scope for inter-related effects to occur as a result of underwater noise.
O&M	Long-term habitat loss/ change due to the presence of project infrastructure.	Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5)	The assessment undertaken in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5) concluded that any impacts would be of Minor adverse significance.	There is limited scope for significant inter-related effects to occur on benthic ecology receptors as a result of these predicted impacts in the O&M phase. Due to the minor/ negligible significance attributed to these impacts in isolation, it is not predicted that inter-related effects of greater significance will occur than those predicted in isolation.
O&M	Effects on benthic ecology and biodiversity due to the presence of project infrastructure.	Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5)	The assessment undertaken in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5) concluded that any impacts would be of Minor adverse significance.	

O&M	Indirect effects on benthic habitats from electromagnetic fields (EMF) generated by inter-array and export cables.	Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5)	The assessment of this potential impact undertaken in Volume 2, Chapter 5: Benthic Subtidal and Intertidal Ecology (Document Ref: 6.2.5) concluded that any impacts would not be significant .
O&M	Indirect impacts on benthic subtidal and intertidal ecology as a result of long-term change of seabed habitat from scour effects and changes in sediment regime.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment of this potential impact undertaken in Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2) concluded that impacts would not be significant .

Receptor led effects

There is the potential for spatial and temporal interactions between the effects arising from habitat loss/ disturbance, and increases SSC and sediment deposition during the project lifetime.

The greatest potential for inter-related effects is predicted to occur through the interaction of both temporary and permanent habitat loss/ disturbance from foundation installation/ jack-up vessels/ anchor placement/ scour, indirect habitat disturbance due to sediment deposition and indirect effects of changes in physical processes due the presence of infrastructure in the operational wind farm.

With respect to this interaction, these individual impacts were assigned a significance of minor adverse significance as standalone impacts and although potential combined impacts may arise (i.e. spatial and temporal overlap of direct habitat disturbance), it is predicted that this will not be any more significant than the individual impacts in isolation. This is because the combined amount of habitat potentially affected would be very limited, the biotypes affected are widespread across the southern North Sea, and where temporary disturbance occurs, full recovery of the benthos is predicted. In addition, any effects due to changes in the physical processes are likely to be limited, both in extent and in magnitude, with receptors having low sensitivity to the scale of changes predicted. As such, these interactions are predicted to be no greater in significance than that for the individual effects assessed in isolation.

Table 14.4: Inter-related effect assessment – Fish and shellfish ecology

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M, decommissioning	Direct damage and disturbance to mobile demersal and pelagic fish and shellfish species and habitat loss arising from construction/ decommissioning and O&M activities.	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the significance of this impact would be Minor adverse in the construction/ decommissioning phase and Negligible adverse in the O&M phase.	When habitat loss (temporary or permanent) is considered additively across all phases of the project, whilst the total area of habitat affected is larger than for the individual project phases, similar habitats are widespread in the southern North Sea. During the O&M phase the majority of the disturbance will be highly localised with little repeat disturbance and the habitats affected are predicted to recover. Therefore, across the project lifetime the effects on fish and shellfish receptors are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.
Construction, O&M, decommissioning	Mortality, injury, behavioural changes and auditory masking arising from noise and vibration.	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the significance of this impact would be Minor adverse in the construction/ decommissioning phase and Negligible adverse in the O&M phase.	The majority of disturbance from underwater noise is predicted to result from piling during the construction phase. Noise associated the O&M and decommissioning phases will be of a much lower level (however still of minor significance). Therefore, effects on fish and shellfish are from underwater noise are not predicted to interact in such a way to result in effects of a greater significance than the assessments in isolation.
Construction/ decommissioning	Indirect effects due to increases in SSC and sediment deposition.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the significance of this impact would be Minor adverse.	The majority of seabed disturbance resulting in increased SSC and sediment deposition will occur during the construction and decommissioning phases. There is also potential during the O&M phase during maintenance activities, however these will be both spatially and temporally isolated. Receptors and associated spawning/ nursery habitats potentially affected by increases SSC and deposition are predicted to recover between these phases. Therefore, across the project lifetime, there is no potential for inter-related affects associated with this impact and any effects are not predicted to be of greater significance than those assessed in isolation.
Construction/ decommissioning,	Indirect effects of seabed disturbances leading to the release of sediment contaminants.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the significance of this impact would be Minor adverse.	The construction phase is likely to result in the greatest level of impact from the release of sediment contaminants from the re-suspension of sediments. Subsequent effects in the decommissioning phase are likely to be of a much lower level and due to the significant temporal gap between the construction and decommissioning phases, full recovery is expected during this time. There is potential during O&M during maintenance activities, however these will be both spatially and temporally isolated. Therefore, any inter-related effects are not predicted to be of greater significance than those already identified.
O&M	Increased hard substrate and structural complexity as a result of the introduction of	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the	There is scope for inter-related effects to occur as a result of these impacts in the O&M phase due to temporal and spatial overlap.

	turbine foundations, and scour and cable protection.		significance of this impact would be Minor adverse.	With respect to increased hard substrate and structural complexity, it is expected that fish and shellfish ecology receptors would naturalise to this change and as such it is not predicted to be an ongoing adverse impact beyond the end of the construction phase.
O&M	Electromagnetic fields (EMF) arising from cables	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the significance of this impact would be Minor adverse.	With respect to EMF effects, there is some uncertainty about the nature of any adverse impacts. After undertaking a precautionary assessment, potential effects are not expected to result in inter-related effects beyond those predicted for this impact in isolation.
O&M	Indirect effects resulting from the accidental release of pollutants.	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment undertaken in Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that the significance of this impact would be Minor adverse.	With respect to contamination due to the accidental release of pollutants, the likelihood of project lifetime inter-related effects arising is low given the mitigation measures (e.g. the Project Environmental Management Plan secured as a condition in the DML) that will be applied throughout the various development stages, which will ensure that the risk of interaction of such effects is limited. Therefore, across the project lifetime, the effects on fish and shellfish receptors are not anticipated to interact in such a way as to result in combined effects of greater significance than the assessments presented for each individual phase.
O&M	Potentially reduced fishing pressure within the Thanet Extension array area and increases in fishing pressure outside the array area due to displacement.	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment within Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6) concluded that this effect would be of Negligible adverse significance.	With respect to the displacement of fishing pressure, although safety zones may result in temporary and localised displacement of fisheries activity (primarily drift netting), this effect will mainly arise as a result of the physical presence of project infrastructure. It is important to note that impacts to drift-netting were the only effect considered to be of minor/ moderate significance in the assessment. This, combined with the low level of significance attributed to this effect (negligible), no inter-related effects are predicted to occur that are of greater significance than those predicted for this impact in isolation.

Receptor led effects

The greatest scope for potential inter-related impacts is predicted to arise through the interaction of habitat loss/ change (temporary and long-term), increased SSC, underwater noise and EMF effects, and through the interaction of contamination due to the accidental release of pollutants and the re-suspension of contaminants from sediments.

With respect to the interaction with increased DDC and sediment deposition, underwater noise and EMF effects, these individual impacts were assigned a significance of **Negligible to Minor** adverse as standalone impacts and although potential inter-related impacts may arise, it is important to recognise that some of the activities are mutually exclusive. Furthermore, underwater noise from piling which is predicted to result in displacement of mobile fish species will in turn mean that these species will not be exposed to the greatest predicted increases in SCC from seabed preparation and drilling in the array area. Similarly, any potential behavioural effects as a result of EMF would likely occur over the same areas as habitat loss/ disturbance, and therefore these effects would not be additive. Therefore, effects of greater significance than the individual impacts in isolation are not predicted.

With respect to the second interaction of contamination effects, the likelihood for accidental release of pollutants is low given the control measures that will be applied. In addition, the recorded level of offshore sediment contamination has been found to be unlikely to result in adverse biological effects. As such, with the appropriate measures in place, it is concluded that the significance of effect will be no greater than the individual effects assessed in isolation within the individual effects assessments.

Table 14.5: Inter-related effects assessment – Marine mammal ecology

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M decommissioning	Effects due to underwater noise	Volume 2, Chapter 7: Marine Mammal Ecology (Document Ref: 6.2.7)	The assessment concluded that this impact would be of minor significance in relation to harbour porpoise and negligible to minor in relation to seals in the construction phase, and Negligible adverse for all receptors in the O&M and decommissioning phases.	Underwater noise will be produced at all project stages, including for example piling and vessel noise during construction, and vessel noise during the O&M phase. It should be noted that piling events causing these effects will be temporarily discrete and intermittent through the construction phase. The negligible significance predicted for the O&M and decommissioning phases will not increase the level of significance over the project lifetime, above that predicted for each individual phase.
Construction, O&M decommissioning	Effects due to vessel interactions	Volume 2, Chapter 10: Shipping and Navigation (Document Ref: 6.2.10)	The assessment concluded that this impact would be of minor significance in the construction/ decommissioning phases and Negligible adverse in the O&M phase.	There is no potential for temporal overlap between the construction and decommissioning phases where the majority of vessel interactions will occur. Due to the negligible level of significance of this impact attributed to the O&M phase, it is not predicted that any inter-related effects greater than those predicted for impacts in isolation would occur.
Construction, O&M decommissioning	Effects due to impacts to prey species	Volume 2, Chapter 6: Fish and Shellfish Ecology (Document Ref: 6.2.6)	The assessment concluded that there would be no indirect impacts in the construction/ decommissioning phases and Minor beneficial impacts in the O&M phase.	Impacts to fish and shellfish receptors will not result in an ongoing, additive loss of prey, rather it would result in an initial loss during the construction phase, followed by recovery, leading to no long-term or large-scale loss of prey.
Construction/ decommissioning	Effects due to changes to/ deterioration of water quality	Volume 2, Chapter 3: Marine Water Quality and Sediment Quality (Document Ref: 6.2.3)	The assessment concluded that this impact would be of Negligible adverse significance.	Effects due to changes in water quality will only occur in the construction and decommissioning phases, and full recovery is expected during the O&M phase. As such, multiple effects are not predicted for this impact, as there is no temporal overlap between the two phases.
Construction	Disturbance at seal haul-out sites	Volume 2, Chapter 7: Marine Mammal Ecology (Document Ref: 6.2.7)	The assessment concluded that this impact would be of Minor adverse significance.	During the construction, there is no potential for multiple effects as it is the only impact to affect seal haul out sites and there is therefore no pathway for inter-related effects.
<i>Receptor led effects</i>				
<p>There is the potential for spatial and temporal interactions between underwater noise, vessel interactions, effects on prey species and contamination effects during the lifetime of Thanet Extension.</p> <p>The greatest scope for interaction of different effects on marine mammal ecology is during the construction phase, when the most significant impact to marine mammals (i.e. underwater noise from piling) is likely to interact with other impacts. Therefore, the greatest scope for potential inter-related effects is likely to arise through the interaction of noise, vessel interactions and effects on prey species.</p> <p>With respect to this interaction, the individual impacts were assigned a significance of negligible to minor as standalone impacts and although combined impacts may arise it is important to note that some of these activities are potentially mutually exclusive. For example, underwater noise from piling will result in the displacement of marine mammals from the Thanet Extension array area which will in turn mean that these species will not be exposed to effects of changes in water quality or reduction in prey species within that area. They will also be displaced from the areas of highest vessel traffic within the Thanet Extension array area. Situation may also arise where any potential disturbance to prey species is offset by the fact that as marine mammals are temporarily displaced from areas around piling, the fish that form part of their diet may also be temporarily displaced, remaining available for marine mammal feeding. Overall, effects on prey species (fish and shellfish) have been assessed as being of Minor or Negligible adverse significance, and therefore there is limited potential for any receptor-led effects of greater significance than those assessed in isolation.</p>				

Table 14.6: Inter-related effects assessment – Marine and coastal archaeology

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M decommissioning	Permanent loss/ physical disturbance of known and potential seabed receptors in shallow sediments.	Volume 2, Chapter 13: Marine and Coastal Archaeology (Document Ref: 6.2.13)	The assessment concluded that with appropriate mitigation, this impact would be of Minor adverse significance.	There is limited scope for significant inter-related effects on archaeological resources as a result of the interactions of the various impacts as any such effects will be avoided by the implementation of standard mitigation measures via the Written Scheme of Investigation (WSI). On the basis of this, it is considered that no additional inter-related effects are likely to arise.
Construction, O&M decommissioning	Permanent physical loss/ disturbance of known and potential seabed pre-history receptors where activities penetrate the seabed.	Volume 2, Chapter 13: Marine and Coastal Archaeology (Document Ref: 6.2.13)	The assessment concluded that with appropriate mitigation, this impact would be of Minor adverse significance.	
Construction, O&M decommissioning	Indirect effects upon known and potential marine archaeological receptors as a result of changes to sedimentation and hydrodynamic.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment concluded that this impact would be of Negligible adverse significance.	
Construction, O&M decommissioning	Indirect effects on the setting of marine archaeological receptors offshore and at the landfall.	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that this impact would be of Minor adverse significance.	
<i>Receptor led effects</i>				
<p>There is the potential for spatial and temporal interactions between direct and indirect impacts to marine archaeological receptor. The scope for inter-related effects is predicted to arise through combined effects on different elements of the historic environment, and through direct physical impacts on heritage assets interacting with indirect impacts from sediment deposition which may lead to further damage to the same receptor via increased exposure.</p> <p>The mitigation measures proposed for Thanet Extension, which includes the implementation of Archaeological Exclusion Zones (AEZs) to avoid sites of identified archaeological significance, will minimise combined effects on different elements of the historic environment. It is therefore predicted that any inter-related effect will not be of any greater significance than those already assessed in isolation.</p>				

Table 14.7: Inter-related effects assessment – Seascape, landscape and visual

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction/ decommissioning	Seascape effects	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that effects on seascape character would be not significant for all SCAs, with the exception of two SCAs, which were assessed as having significant effects: Broadstairs Knolls and Ramsgate Road; and Margate Roads.	With respect to the project life cycle, there is scope for inter-related effects to arise related to seascape, landscape and visual effects in the construction/ decommissioning phases as significant effects on some receptors are predicted throughout the project lifetime. Considering that long-term effects are expected in the O&M phase, with short-term effects predicted in the construction/ decommissioning phases, it is unlikely that the short-term effects will significantly add to the long-term effects over the entire project lifetime. It is therefore predicted that overall, no effects will occur of greater significance across the project lifetime than those predicted for the project phases in isolation. With respect to landscape and visual receptors, the assessment undertaken has included a wide range of viewpoints and sensitive locations around the region. Using the most sensitive receptors throughout, the assessment therefore provides a fully comprehensive and representative assessment of the highest potential change from current conditions that could arise from the development of the project.
	Landscape effects	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that effects on landscape character would be not significant for all LCAs, with the exception of three LCAs, which were assessed as having significant effects: Foreness Point and North Foreland; Ramsgate and Broadstairs Cliffs; and North Thanet Coast.	
	Visual effects	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that visual effects would be not significant for 17 of the 29 viewpoints assessed, with significant effects on 12 of the viewpoints assessed.	
O&M	Seascape effects	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that effects on seascape character would be not significant for all SCAs, with the exception of two SCAs, which were assessed as having significant effects: Broadstairs Knolls and Ramsgate Road; and Margate Roads.	The assessment undertaken is inherently inclusive of inter-relationships as it includes all aspects of the character of an area, such as historic setting, human activity (e.g. shipping and fishing) and ecological factors. The subdivision of all receptors into specific types (i.e. seascape, landscape and visual receptors etc.) represents a focusing of impact assessment from the wider and inter-related consideration of the potential for the project to change the character and amenity of the region. This assessment considers all aspects as derived by the site photography and visualisations used within Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12). It is therefore considered that no additional inter-related effects are likely to occur beyond those already identified within Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12).
	Landscape effects	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that effects on landscape character would be not significant for all LCAs, with the exception of three LCAs, which were assessed as having significant effects: Foreness Point and North Foreland; Ramsgate and Broadstairs Cliffs; and North Thanet Coast.	
	Visual effects	Volume 2, Chapter 12: Seascape, Landscape and Visual (Document Ref: 6.2.12)	The assessment concluded that effects on seascape character would be not significant for all SCAs, with the exception of two SCAs, which were assessed as having significant effects: Broadstairs Knolls and Ramsgate Road; and Margate Roads.	

Receptor led effects

There is potential for spatial and temporal interaction between the direct and indirect impacts to seascape, landscape and visual receptors outlined above. The greatest scope for potential inter-related impacts is predicted to arise through the interaction of impacts on the visual receptors known to be present within the Seascape, Landscape and Visual study area.

With respect to this interaction, combined effects on visual receptors will vary temporally and spatially across the study area according to the activities being undertaken. Construction effects will cease upon completion of construction and will give way to O&M and maintenance phase effects which will be fully reversible when the project is decommissioned. Therefore, the significance of these combined effects on visual receptors will not be of any greater significance than the effects when assessed in isolation.

As stated above, the assessment of effects to seascape, landscape and visual receptors is inherently inclusive of inter-related effects.

Table 14.8: Inter-related effects assessment – Water Quality and Sediment Quality

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M decommissioning	Deterioration in water quality due to re-suspension of sediments.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment concluded that this impact would be of Minor adverse significance.	There is limited scope for inter-related effects to occur as a result of interactions between impacts to water and sediment quality. These impacts are directly as a result of impacts to marine physical processes. Knock-on effects to biological receptors are covered in the tables above.
Construction, O&M decommissioning	Deterioration in water quality due to the release of contaminants due to the release of contaminants from disturbed sediments.	Volume 2, Chapter 2: Marine Geology, Oceanography and Physical Processes (Document Ref: 6.2.2)	The assessment concluded that this impact would be of Minor adverse significance.	
Construction, O&M decommissioning	Accidental release of pollutants.	Volume 2, Chapter 3: Water Quality and Sediment Quality (Document Ref: 6.2.3)	The assessment concluded that this impact would be of Minor adverse significance.	Due to the implementation of mitigation and the following of standard control measures and the implementation of a Project Environmental Management and Monitoring Plan (PEMMP), it is not expected that this impact will have inter-relationships with other impacts to produce impacts of greater significance than those assessed in isolation.
<i>Receptor led effects</i>				
<p>There is the potential for temporal and spatial interactions between direct and indirect impacts to water and sediment quality. The scope for inter-related effects is predicted to arise through the combined effects of deterioration in water quality as a result of the re-suspension of sediments, and the release of contaminants from re-suspended sediments, which may lead to impacts of a greater significance than when the two impacts are considered in isolation.</p> <p>With respect to this interaction, combined effects on water and sediment quality will vary across the study area according to the activities being undertaken. During construction, the potential for inter-related effects is at its greatest, whilst this decreases rapidly during O&M being limited to maintenance activities. During decommissioning, the potential for impacts will be similar to that during construction. Since the two effects are intrinsically linked (release of sediment contaminants cannot occur without re-suspension), there is potential for inter-related effects. However, it should be noted that both impacts were assessed as being of Minor adverse significance in isolation.</p>				

Table 14.9: Inter-related effects assessment - Onshore Biodiversity

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M decommissioning	Effects associated with land take and land cover change.	Volume 3, Chapter 5: Biodiversity (Document Ref: 6.3.5)	The assessments concluded that effects would be not significant.	<p>There is the potential for inter-related effects to occur across the project lifetime due to habitat loss/ change. In the construction/ decommissioning phases, this mainly relates to temporary habitat loss, whilst mainly relating to permanent habitat loss/ change in the O&M phase. As such, there is limited scope for project lifetime inter-related effects to occur, due to the limited temporal overlap of such impacts.</p> <p>Given the minimal potential for impacts to arise, there is little potential for any inter-related effects above the level of significance identified for the impacts individually.</p>
	Effects associated with increased light, noise and vibration (disturbance)	Volume 3, Chapter 5: Biodiversity (Document Ref: 6.3.5) Volume 3, Chapter 9: Noise and Vibration (Document Ref: 6.3.9) Volume 3, Chapter 2: Landscape and Visual (Document Ref: 6.3.2)	The assessments concluded that effects would be not significant.	<p>The potential inter-related effects associated with disturbance due to light, noise and vibration during construction/ decommissioning and O&M are fully assessed for each phase within Volume 3, Chapter 5: Biodiversity (Document Ref: 6.3.5). As effects in the O&M phase are predicted to be of a much lower level compared to the construction/ decommissioning phases, there is limited scope for project lifetime inter-related effects to occur as a result of this impact. It is therefore predicted that inter-related effects will not occur at a level of significance above that assessed for the impacts in isolation.</p>
	Effects associated with increased vehicle movements	Volume 3, Chapter 8: Traffic and Transport (Document Ref: 6.3.7)	The assessments concluded that effects would be not significant.	<p>Vessel movements in the decommissioning phase are likely to be lower than during construction, but greater than during O&M. Due to the temporal separation between the construction and decommissioning phases, there is no potential for inter-related effects across construction/ decommissioning.</p> <p>As above, impacts due to increased vehicle movements in the O&M phase are of a far lower level compared to those in the construction/ decommissioning phases, being limited to just one return journey for each of the two substations in the O&M phase per week. As a result, inter-related project lifetime effects are not predicted to occur at a level of significance above that assessed for the impacts in isolation.</p>
	Effects associated with pollution (air and water)	Volume 3, Chapter 6: Ground Conditions, Flood Risk and Land Use (Document Ref: 6.3.6)	The assessments concluded that effects would be not significant.	<p>There is potential for inter-related effects on designated sites as a result of combined impacts during the construction/ decommissioning and O&M phases due to pollution. Dust deposition and impacts to soil conditions will be controlled through provisions within the Code of Construction Practice (Document Ref: 8.1), resulting in no significant inter-related effects arising across the development phases.</p>

		<p>Volume 3, Chapter 9: Air Quality (Document Ref: 6.3.9)</p>		<p>It is important to note that although there is the potential for effects from pollution to occur in the O&M phase (such as from dust), these will be far more limited in extent within the O&M phase, and as such, there is limited scope for these effects to occur across the project lifetime.</p> <p>Given the minimal potential for impacts to arise, there is little potential for an inter-related effect above the 'not significant' level identified for the impacts individually.</p>
<p><i>Receptor-led effects</i></p>				
<p>The greatest scope for inter-related effects is expected to occur as a result of interactions between land cover/ land take and disturbance effects. This interaction may lead to effects of greater significance than the effects considered in isolation.</p> <p>With respect to this interaction, the potential for inter-related effects is greatest during construction, whilst this will decrease rapidly as the project moves to O&M. During decommissioning, if all project infrastructure is removed, effects will be similar to the construction phase.</p>				

Table 14.10 Inter-related effects assessment – Onshore LVIA

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction	Physical landscape effects.	Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2)	The assessment concluded that impacts due to changes to the physical landscape would not be significant in the construction phase.	<p>With respect to the project life cycle, there is scope for inter-related effects to arise related to the landfall, cable corridor and substation, however, the initial impacts from the construction phase will decrease in significance as the project moves to the O&M phase.</p> <p>The temporary effects of construction will reduce once construction is completed and the project is O&M. Decommissioning activities will incur impacts to landscape and visual receptors whilst plant is on site, however the effect is temporary as in the construction phase.</p> <p>With respect to landscape and visual receptors, the assessment undertaken has included a wide range of viewpoints and sensitive locations around the region. Using the most sensitive receptors throughout, the assessment therefore provides a fully comprehensive and representative assessment of the highest potential change from current conditions that could arise from the development of the project.</p>
	Landscape character effects.	Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2)	The assessment concluded that impacts to landscape character due to onshore cable route and landfall construction would be significant within the Pegwell Bay LCA with respect to landfall Options 2 and 3. All other impacts during construction such as from substation construction and effects on other LCAs were assessed as not significant .	
	Visual effects.	Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2)	The assessment concluded that there would be significant impacts to one visual receptor (Viewpoint 10), with no significant effects predicted for other visual receptors during construction.	
O&M	Physical landscape effects.	Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2)	The assessment concluded that impacts due to changes to the physical landscape would not be significant in the O&M phase.	<p>The assessment undertaken is inherently inclusive of inter-relationships as it includes all aspects of the character of an area, such as historic setting, human activity (recreation and traffic) and ecological factors. The subdivision of all receptors into specific types (i.e. landscape and visual receptors etc.) represents a focusing of impact assessment from the wider and inter-related consideration of the potential for the project to change the character and amenity of the region. This assessment considers all aspects as derived by the site photography and visualisations used within Volume 3, Chapter 2: Landscape and Visual Impact Assessment (Document Ref: 6.3.2). It is therefore considered that no additional inter-related effects are likely to occur beyond those identified in Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2).</p>
	Landscape character effects.	Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2)	The assessment concluded no significant impacts to landscape character during the O&M phase.	
	Visual effects.	Volume 3, Chapter 2: Onshore LVIA (Document Ref: 6.3.2)	The assessment concluded no significant impacts to visual receptors during the O&M phase.	
<i>Receptor led effects</i>				
<p>There is potential for spatial and temporal interaction between the direct and indirect impacts to landscape and visual receptors outlined above. The greatest scope for potential inter-related impacts is predicted to arise through the interaction of impacts on the visual receptors known to be present within the landscape and visual study area.</p>				

With respect to this interaction, combined effects on visual receptors will vary temporally and spatially across the study area according to the activities being undertaken. Construction effects will cease upon completion of construction and will give way to O&M and maintenance phase effects which will be fully reversible when the project is decommissioned. Therefore, the significance of these combined effects on visual receptors will not be of any greater significance than the effects when assessed in isolation.

Table 14.11: Inter-related effects assessment – Noise and Vibration

Development phase	Nature of inter-related effect	Source chapter	Individual assessment	Inter-related effect assessment
<i>Project lifetime effects</i>				
Construction, O&M decommissioning	Road traffic noise	Volume 3, Chapter 10: Noise and Vibration (Document Ref: 6.3.10)	The assessment concluded that this impact would be of Negligible adverse significance.	The assessment presented in Volume 3, Chapter 10: Noise and Vibration (Document Ref: 6.3.10) includes the consideration of noise emissions from the project on all sensitive receptor groups and therefore already provides the potential inter-related effects on the same receptor across all phases of the development. This being the case, combined with the predicted negligible significance of the impacts assessed, it can be concluded that there are no further inter-related effects to assess from the onshore elements of the project.
Construction/ decommissioning	Construction noise	Volume 3, Chapter 10: Noise and Vibration (Document Ref: 6.3.10)	The assessment concluded that this impact would be of Negligible adverse significance.	
Construction/ decommissioning	Construction vibration	Volume 3, Chapter 10: Noise and Vibration (Document Ref: 6.3.10)	The assessment concluded that this impact would be of Negligible adverse significance.	
O&M	Noise from fixed plant	Volume 3, Chapter 10: Noise and Vibration (Document Ref: 6.3.10)	The assessment concluded that with appropriate mitigation, this impact would be of Minor adverse significance.	There is very limited scope for inter-related impacts to occur as a result of noise from O&M fixed plant and O&M phase traffic. Vehicle movements in the O&M phase are expected to occur at the substation sites at a frequency of approximately one per week. It is therefore predicted that the significance of any inter-related effect resulting from interactions between operational noise and operation traffic would be no higher than the two impacts considered in isolation.
<i>Receptor-led effects</i>				
The greatest scope for inter-related effects from noise and vibration is expected to arise from the interaction of noise and vibration with visual effects and increased dust and traffic related impacts during the construction phase. The individual impacts were assessed as being of Negligible to Moderate adverse (one visual viewpoint receptor, with the rest being assessed as Minor adverse) significance. Whilst in-combination effects may arise, they are unlikely to be of greater significance than the individual impacts in isolation.				

14.7 Conclusions

- 14.7.1 This chapter has defined the potential inter-related effects considered to arise from Thanet Extension. This has enabled an assessment of the potential inter-related effects on a range of receptor groups to be completed. The assessment has been based on information drawn from the individual chapters for the most part, with the identification of potential inter-related effects being based on qualitative assessment and using expert judgement.
- 14.7.2 The assessment has been undertaken in compliance with EIA regulations and specific guidance produced by PINS, noting that inter-relationships have, in many cases, already been assessed as part of the topic-specific chapters.
- 14.7.3 Overall, the inter-related assessment for Thanet Extension does not identify any significant interrelated effects that were not already covered by the topic-specific assessment set out in the preceding chapters. However, certain individual effects were identified that did interact with each other whilst not leading to any greater significance of effect.

14.8 References

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