Norwich Western Link Environmental Statement Chapter 20: Cumulative Effects

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Glossary of Abbreviations and Defined Terms

The definition of key terms used in this report are provided below. These definitions have been developed by reference to the DMRB LA 104 guidance relevant to the Cumulative Effects Assessment (CEA) as well as professional judgement based on knowledge and experience of similar schemes in the context of the Proposed Scheme.

Term	Definition
Effect Interaction	The interaction or combination of environmental effects of the Proposed Scheme on a common receptor group and / or specific named receptor(s), for example, cumulative noise, ecology and visual effects on a common receptor group or one particular receptor
In-Combination Effect	The combined effects of a number of different projects in the vicinity of the Proposed Scheme (in combination with the Proposed Scheme) on a common sensitive receptor category (similar topics as covered in the Technical Chapters) and / or a single receptor / resource

20 Cumulative Effects

20.1 Introduction

20.1.1 The Cumulative Effects Assessment (CEA) chapter assesses the potential for significant cumulative construction and operation phase environmental effects as a result of the Proposed Scheme.

20.1.2 Cumulative effects are defined by DMRB LA 104 guidance as “Impacts that result from incremental changes caused by other present or reasonably foreseeable actions together with the project”.

20.1.3 To accord with the Environmental Impact Assessment (EIA) Regulations 2017 and best practice guidance, the following types of cumulative effects have been considered within the ES:

- **Effect Interactions**: The interaction or combination of environmental effects of the Proposed Scheme on a common receptor group and / or specific named receptor(s), for example, cumulative noise, ecology and visual effects on a common receptor group or one particular receptor; and
- **In-Combination Effects**: The combined effects of a number of different projects in the vicinity of the Proposed Scheme (in combination with the Proposed Scheme) on a common sensitive receptor category (similar topics as covered in the Technical Chapters) and / or a single receptor / resource.

20.1.4 Understanding the interaction of multiple development types across large temporal and spatial scales is important for predicting how future developments may impact populations, communities, the economy and biodiversity. Most development activities would typically have minor impacts individually, but collectively over time their impact on the environment may be more substantial.

20.2 Effect Interactions Assessment Methodology

Assessment Methodology

20.2.1 The CEA has followed the DMRB guidance, considering the nature of the affected receptors, the relevant impacts reported as part of Chapters 6 to 19 of this ES and the residual effects reported.

20.2.2 The assessment covers the most likely significant cumulative effects, rather than reporting every potential interaction. Professional judgement has been used to determine the significance of Effect Interactions.

20.2.3 The EIA Regulations 2017 require that the EIA process should consider the interaction between the factors listed in Regulation 4(2):

- "(a) population and human health;
- (b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
- (c) land, soil, water, air and climate;
- (d) material assets, cultural heritage, and the landscape; and
- (e) the interaction between the factors referred to in sub-paragraphs (a) to (d)".

20.2.4 Each Technical Chapter of this ES has assessed the categories of common sensitive receptors groups and / or specific named receptors relevant to that chapter topic's methodology.

20.2.5 As part of the assessment of Effect Interactions, common sensitive receptor groups have been identified and used to report residual effects. This has been undertaken as all Technical Chapters in this ES do not report effects on the same specific named receptors, with different locations being reported on, with some reporting using representative receptors. This method allows for differences in approaches to the reporting of effects on different / multiple receptors groups.

20.2.6 The following common sensitive receptor groups have been used as part of the assessment of Effect Interactions to report residual effects:

- Residents
- Above ground heritage assets
- Users of Public Rights of Way (PRoWs) and Walkers, Cyclists & Horse riders (WCH)
- Surface and groundwater

20.2.7 Ecological receptors were not included in this list of sensitive receptor groups, as **Chapter 10: Biodiversity** (Document Reference: 3.10.00) and **Chapter 11: Bats** (Document Reference: 3.11.00) of this ES already consider the potential interactions of noise, air quality and surface / groundwater on designated / non-designated sites and habitats.

20.2.8 In some instances, the same specific named receptor may have been assessed in more than one technical chapter. In these cases, there is the possibility that several individual effects on these common receptors may add up to create a significant cumulative effect. These effects are also considered.

Effect Interaction Study Area

20.2.9 Effect Interactions may occur wherever two or more effects arising during the construction and / or operational phase of the Proposed Scheme have an impact on a common receptor group and / or a specific named receptor. The Study Area for Effect Interactions is therefore considered to be the maximum extent to which two (or more) effects may cause an impact on these types of receptors. In this case, the spatial extent of all effects assessed within each topic chapter in this ES defines the Study Area, this being a 2km radius from the Red Line Boundary. This radius was defined through discussion with the Technical Authors of Chapters 6 to 19 of this ES as being a suitable distance based on professional robust judgement to ensure that all cumulative effects to committed developments are identified.

20.2.10 The assessment of the Effect Interactions was then undertaken using a two-stage approach as set out below.

Stage 1 – Sifting

20.2.11 Sifting has been undertaken to determine whether the common receptor group and / or specific named receptors are exposed to more than one type of reported residual effect during the construction and operational phases of the Proposed Scheme.

20.2.12 An example of an Effect Interaction includes temporary effects on residents during construction, from disruption related to cumulative effects from visual and noise impacts.

20.2.13 The reported residual effects on these following the application of embedded and additional mitigation are presented in **Table 1-1** and **Table 1-3** in **Appendix 20.1 Sifting for Effect Interactions** (Document Reference: 3.20.01).

20.2.14 Those common receptor groups and / or specific named receptors exposed to two or more types of reported residual effects are taken forward to the next stage of assessment (Stage 2). If there is only one type of reported residual effect on a common receptor group and / or specific named receptors (i.e. only one Technical Chapter has identified residual effects on that sensitive receptor) then it is considered that there are no potential Effect Interactions and they are not taken through to the assessment (Stage 2).

20.2.15 To identify where Effect Interactions might occur, a comparison of all Technical Chapters in this ES and their potential to have significant effects on the above common receptor groups and / or specific named receptors was undertaken.

20.2.16 The following technical topics are not considered to give rise to Effect Interactions and have not been considered further in the assessment:

- **Chapter 10: Biodiversity** (Document Reference: 3.10.00) of this ES already considers the potential interactions of noise, air quality and surface / groundwater on designated / non-designated sites and habitats. No further significant Effect Interactions are considered likely;
- **Chapter 11: Bats** (Document Reference: 3.11.00) of this ES already considers the potential interactions of noise and air quality on bats. No further significant Effect Interactions are considered likely;
- **Chapter 13: Geology and Soils** (Document Reference: 3.13.00) of this ES assesses the impacts of the Proposed Scheme on ground conditions, including accidental fuel oil and chemical spills and leaks during the construction phase. This is also assessed within **Chapter 12: Road Drainage and the Water Environment** (Document Reference: 3.12.00)**.** Therefore, as stated in **Chapter 13: Geology and Soils** (Document Reference: 3.13.00)**,** it is therefore considered unlikely that there are any significant Effect Interactions;
- **Chapter 15: Climate Greenhouse Gasses** (Document Reference: 3.15.00) of this ES already considers the cumulative effect of all greenhouse gas ('GHG') that cause climate change, and therefore the assessment of the GHGs due to the Proposed Scheme inherently assesses the cumulative effects of GHG emissions. No further significant Effect Interactions are considered likely;

- **Chapter 16: Climate Resilience** (Document Reference: 3.16.00) assesses the potential impacts of environmental change on the Proposed Scheme, rather than impacts of the Proposed Scheme on the environment: the receptor for the resilience assessment is the Proposed Scheme. As such, no assessment of intra-project combined effects is undertaken, as there are no receptors in common with other assessments; and
- **Chapter 18: Major Accidents and Disasters** (Document Reference: 3.18.00) inherently considers interactions with external factors such as other proposed developments which may impact on the Study Area. The assessment approach for MA&D, which considers the vulnerability of the Proposed Scheme to MA&D events, does not assess potential cumulative effects on sensitive receptors because a MA&D event, is a rare, isolated event, which would not be anticipated to act together with other impacts. Currently, there are no known proposed developments which are considered to increase the vulnerability of the Proposed Scheme to the risk of major accidents and / or disasters. Nonetheless, the Applicant would, subject to the granting of planning consent and the commencement of construction, liaise with the proponents of other proposed developments in the Study Area, should they be built, to control cumulative risks. On these grounds, no significant Effect Interactions are considered likely, and the chapter is not considered further in the Effect Interaction assessment.

20.2.17 A summary of the sifting undertaken and presented in **Appendix 20-1 Sifting for Effect Interaction** (Document Reference: 3.20.01) is included in **Table 20-1** below.

Table 20-1 Sifting of Effect Interactions between Technical Chapters

Effect Interactions Common Receptor Groups	Project Stage	Air Quality	Bats	Biodiversity	Climate Greenhouse Gases	Climate Resilience	Cultural Heritage	Geology and Soils	Landscape and Visual Effects	Major Accidents and Disasters	Material Assets and Waste	Noise and Vibration	Population and Human Health	Road Drainage and Water Environment	Traffic and Transport	Taken forward to Stage 2 assessment of Effect Interactions?
Residents	**Construction**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	**Residual Effect**	Sifted out	No Residual Effect	**Residual Effect**	**Residual Effect**	No Residual Effect	**Residual Effect**	**Yes**
Users of PRoWs and WCH	**Construction**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	**Residual Effect**	Sifted out	No Residual Effect	No Residual Effect	**Residual Effect**	No Residual Effect	**Residual Effect**	**Yes**
Surface and Groundwater	**Construction**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	No Residual Effect	Sifted out	No Residual Effect	No Residual Effect	No Residual Effect	**Residual Effect**	No Residual Effect	No
Above ground heritage assets	**Construction**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	No Residual Effect	Sifted out	No Residual Effect	No Residual Effect	No Residual Effect	No Residual Effect	No Residual Effect	No
Residents	**Operation**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	**Residual Effect**	Sifted out	No Residual Effect	**Residual Effect**	**Residual Effect**	No Residual Effect	No Residual Effect	**Yes**
Users of PRoWs and WCH	**Operation**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	**Residual Effect**	Sifted out	No Residual Effect	No Residual Effect	**Residual Effect**	No Residual Effect	**Residual Effect**	**Yes**
Surface and Groundwater	**Operation**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	No Residual Effect	Sifted out	No Residual Effect	Sifted out	No Residual Effect	No Residual Effect	No Residual Effect	**Residual Effect**	Not applicable	No
Above ground heritage assets	**Operation**	No Residual Effect	Sifted out	Sifted out	Sifted out	Sifted out	**Residual Effect**	Sifted out	No Residual Effect	Sifted out	No Residual Effect	No Residual Effect	No Residual Effect	No Residual Effect	Not applicable	No

Stage 2 – Assessment for Effect Interactions

20.2.18 A qualitative assessment of the overall significance of the Effect Interactions on the common receptor groups and / or specific named receptors identified at the sifting stage has been undertaken based on technical information provided in the Technical Chapters and supporting appendices of this ES, as well as professional judgement. Given that the types of effects and the approach to the reporting of effects on receptors can differ from topic to topic, a quantitative assessment was not possible, and it was necessary to apply professional judgement in determining the level of significance.

20.2.19 The results of this qualitative assessment are presented in summary for the construction phase in **Table 20-4** and for the operational phase in **Table 20-5.**

20.3 In-combination Effects Assessment Methodology

20.3.1 The approach to the assessment of In-Combination Effects considers the combined impacts on common sensitive receptor categories (i.e. the topics covered by the Technical Chapters of this ES - Landscape and Visual, Noise and Vibration etc.) from one or more applicable developments.

20.3.2 For the purposes of this assessment, applicable developments are defined in line with DMRB LA 104 guidance (LA 104) from section 3.21.2, which requires the assessment of In-Combination Effects on:

- “Roads projects which have been confirmed for delivery over a similar timeframe;
- other development projects with valid planning permissions or consent orders, and for which EIA is a requirement; and
- proposals in adopted development plans with a clear identified programme for delivery”.

20.3.3 For robustness, and to adhere to best practice for Effect Interaction assessment, the following guidance laid out in section 1.3.1 of the DMRB LA 104 Welsh guidance appendix has also been adhered to:

- "the likely effect of areas of land in adopted development plans highlighted for development".

In-combination Effects Study Area

20.3.4 Through analysis of the extant and emerging planning policy from the sources detailed below, committed developments (and other proposed developments for which planning applications have been submitted and which may have common sensitive receptor categories and phases) within 2km of the Red Line Boundary have been identified:

- Broadland District Council Planning Portal, Site Allocation Development Plan, and Neighbourhood Allocation Plan;
- South Norfolk District Council Planning Portal, Site Allocation Development Plan, and Neighbourhood Allocation Plan;
- Breckland District Council Planning Portal, Site Allocation Development Plan, and Neighbourhood Allocation Plan;
- National Infrastructure Planning Portal; and
- The Greater Norwich Local Plan.

20.3.5 Where large schemes such as Development Consent Orders (DCOs) were identified outside this Study Area but still within relative proximity, professional judgement was used in relation to their inclusion as part of the assessment.

20.3.6 The stages undertaken as part of this approach are set out below.

Stage 1 – Identification and Evaluation of Projects for Consideration

20.3.7 In order to identify potential committed developments that could give rise to In-Combination Effects with the Proposed Scheme, a high-level review of planning applications submitted to Broadland District and South Norfolk Councils within the last 3 years within a 2km radius of the Red Line Boundary has been undertaken.

20.3.8 For **Chapter 11: Bats** (Document Reference: 3.11.00) of this ES, the in-combination assessment was informed by a larger committed development dataset from a 6km Study Area that captured smaller developments such as barn conversions that are pertinent to the bat assessment. Therefore, this assessment is not included within this Chapter, the sifting and in-combination assessment of this 6km committed development dataset can instead be found in **Appendix 11.8 Bat In-Combination Assessment** (Document Reference: 3.11.08).

20.3.9 Applicable projects for consideration of In-Combination Effects have been determined using the criteria outlined in paragraph 20.3.2.

20.3.10 An overview of the planned developments and supporting environmental information was then gathered. Where such information was not available within the documents supporting each planning application, this was highlighted with a high-level appraisal using publicly available sources undertaken to inform the assessment of In-Combination Effects.

20.3.11 Each of the identified planned developments was then evaluated to determine whether the following criteria were met:

- Is there potential for a concurrent demolition, construction or operational phase with the Proposed Scheme?; and
- Is there potential that the Proposed Scheme shares common sensitive receptor categories with the project(s)?

20.3.12 The committed developments which met the above criteria were then evaluated to inform the selection of schemes for consideration. The selection criteria were:

- Application status and programme for delivery;
- Applications of a relevant size and scale which are categorised as a Schedule 2 EIA Development , may result in cumulative environmental impacts and effects. Applications for other developments of 10 or more homes; industrial, commercial, or retail based applications over 500m^2 have also been considered as part of this stage; and
- Common sensitive receptors categories – only those applications with identifiable common sensitive receptors categories such as potential cumulative landscape and visual, biodiversity, flooding impacts etc. were taken forward.

20.3.13 The assessment of In-Combination Effects has been based on the residual effects identified in the Technical Chapters of this ES as well as available environmental information for the applicable developments to identify common sensitive receptors categories within the Study Area.

20.3.14 In addition to the schemes selected using the above criteria, several DCO committed developments have been identified and included for consideration on a precautionary basis. The Vattenfall Norfolk Boreas Project was included within the shortlist at the specific request of the EHO at Breckland Council, despite being 6.3km from the Proposed Scheme, due to its size and the potential for cumulative impacts. Furthermore, the Equinor Sheringham Shoal & Dudgeon Extension Project was also included due to its size and proximity, despite it not yet having received full planning approval. The A47 Thickthorn Junction Improvement DCO was considered at the sifting stage, however, it was not taken forward to the shortlist given it is already included within the committed development background assumptions in the strategic

traffic network modelling and as it is over 11km from the In-Combination Study Area.

20.3.15 Any relevant allocations detailed within the extant local adopted site allocation development plans and neighbourhood allocation plans published on Broadland, South Norfolk, and Breckland District Council websites were included for consideration. The planning policy detailed in the Greater Norwich Local Plan was also reviewed, and any qualifying allocations detailed that were within a 2km radius of the Proposed Scheme were also added to the committed development shortlist.

20.3.16 A **Sustainable Transport Strategy (STS)** (Document Reference: 4.02.00) has been submitted with the planning application for the Proposed Scheme., The STS sets out a range of wider Complementary Sustainable Transport Measures that are proposed to improve walking, cycling and public transport use to the west of Norwich beyond the Red Line Boundary. These Complementary Sustainable Transport Measures would take advantage of the reduction in traffic volumes on local roads and redistributions of traffic that are predicted once the Proposed Scheme is in operation and includes the Cycle-Friendly Routes and Bus Improvement Measures summarised in the STS. While it is anticipated that all of the works required to implement the Complementary Sustainable Transport Measures could be carried out within the bounds of the existing highway, the precise details of any physical works have not been determined and, as such, the Applicant does not seek planning permission for them as part of its planning application for the Proposed Scheme. Consequently, the Complementary Sustainable Transport Measures have been assessed as a separate scheme and assessed cumulatively in this Chapter as S15 Sustainable Transport Scheme Element as illustrated on **Figure 20.1** in **Appendix 20.3: Figures** (Document Reference: 3.20.03).

20.3.17 **Table 20-2: Committed Developments** lists these planning applications, DCOs, allocations and Complementary Sustainable Transport Measures which have potential to have concurrent demolition, construction, or operational phases with that of the Proposed Scheme and includes descriptions of the developments and their status as of the 24th of April 2023.

Table 20-2 Committed Developments

ID	Planning and Development Reference Number	Description	Status (as of 24/04/2023)
S1	20201769 - TMA Bark Supplies Ltd, Woodforde Farm, Weston Green Road, Weston Longville, NR9 5LG	Retention of 42m x 42m concrete hardstanding, building and bagging machinery; proposed increase of existing hardstanding area for bark processing / storage and erection of storage building	Full Planning Permission Granted on the: 08-01-2021
S2	20211831 - Roundwood,44 Ringland Road, Taverham, NR8 6HY	Change of use of existing land to a campsite with associated toilet and shower block and reception / office space	Full Planning Permission Granted on the: 14-12-2021
S3	20172148 – Land off Beach Ave	Residential Development of up to 93 Dwellings with Associated Access, Parking and Open Space (Outline)	Outline Approval Granted on the: 28-09-2018

ID	Planning and Development Reference Number	Description	Status (as of 24/04/2023)
S4	20201332 - Spring Farm, Fir Covert Road, Taverham, NR10 4DT	Earth Bund directly north of the Northern Distributor Road (A1270), land that lies between the Fakenham Road and Fir Covert Road junctions.	Full Approval Granted on the: 07-09-2020
S5	20171782 - Taverham Garden Centre, Fir Covert Road, Taverham, NR8 6HT	Hybrid planning application (part outline, part detailed) made up of: 1. An application for outline planning permission for the erection of a Class A1 retail unit; a Class A3/A4 public house / restaurant; Class A3/A5 fast food restaurant; and a Class A1/A3/B1 lifestyle leisure unit. 2. An application for full planning permission for the construction of a supermarket (Class A1), together with associated access, car parking and landscaping. The supermarket will comprise a total of 2,206 square metres, gross external footprint, and will be served by a total of 129 car parking spaces (of which 7 would be disabled spaces, and 8 parent and child spaces).	Full Approval n Granted on the: 12-02-2018

ID	Planning and Development Reference Number	Description	Status (as of 24/04/2023)
S6	A47 DCO - North Tuddenham to Easton	Proposed dual carriageway A47 North Tuddenham to Easton. Also PINS application (row 568) - Dualling of the single carriageway section of the A47 between Norwich and Dereham, linking together two existing sections of dual carriageway. The scheme will provide a new route to the south of Hockering and to the north of Honingham and include new junctions with locations yet to be determined.	Granted
S7	DCO – Hornsea Project 3 – Offshore Wind Farm	Hornsea Project Three Offshore Wind Farm – construction of onshore cable route and associated substations.	Granted 31/12/20
S8	20190021 - The Kennels, Ringland Lane, Morton on the Hill, NR8 6JW	Part Change of Use from C3 to D2 for the Use of the Site as a Wedding Venue for up to 20 Weddings per Year and Use of Buildings and Marquee in Association with Wedding Venue.	Full Approval Granted on the: 21/03/19

ID	Planning and Development Reference Number	Description	Status (as of 24/04/2023)
S9	2022/0509 - Land East of Barnham Broom Road Colton Norfolk	Ground mounted solar photovoltaic (PV) farm with battery storage; along with continued agricultural use, ancillary infrastructure and security fencing, landscaping provision, ecological enhancements and associated works including underground cabling.	Full Approval Granted with Conditions on the: 30/06/2022
S10	DCO - Norfolk Boreas Offshore Wind Farm	Norfolk Boreas Offshore Wind Farm - onshore cable route	Granted
S11	DCO – Sheringham and Dudgeon Extension Projects.	Equinor Sheringham Shoal & Dudgeon Wind Farm Extension Project onshore cabling routes and associated substations.	Approval Pending

ID	Planning and Development Reference Number	Description	Status (as of 24/04/2023)
S12	Allocation GNLP0337R	This is a strategic-scale site well-related to the existing edge of Thorpe Marriott with no major constraints to make the site unsuitable for development. The site will need to be masterplanned to provide a local centre, community and recreation facilities including a school and medical care facility. Highway improvements will be needed including provision of roundabout access at Fir Covert Road, priority access at Reepham Road and traffic signals at the A1067 Fakenham Road / Fir Covert Road.	Emerging Allocation
S13	Allocation GNLP0159R	This site off Beech Avenue is allocated with access via the adjacent site with planning permission (20191065) under the same land ownership. The total area allocated reflects the mature trees on site as well as other buildings shown on the site map below.	Emerging Allocation

ID	Planning and Development Reference Number	Description	Status (as of 24/04/2023)
S14	Complementary Sustainable Transport Measures (described in the Sustainable Transport Strategy (Document Reference 4.02.00))	Cycle friendly improvements within the highway boundary and bus improvement measures. This includes bus stop improvements and a potential new bus route connecting residential areas of Taverham, Drayton and Costessey with key employment sites in the west of Norwich including Norfolk and Norwich University Hospital and UEA.	As outlined in the Norwich Western Link Sustainable Transport Strategy (not part of the Proposed Scheme).
S15	2023/2200 - Wensum Valley Golf Club Beech Avenue Taverham Norfolk NR8 6HW	Excavation of soils to construct an irrigation reservoir at Wensum Valley Golf and Country Club.	Approved 15/01/24
S16	2023/2575 - Hornsea Windfarm Three Land Drainage East Of Blackbreck Lane Weston Longville Norfolk	Installation of pre construction field drainage to support the operation of the Hornsea Project Three onshore export cable route (EIA Development)	Pending Consideration

Stage 2 – Identification of Common Sensitive Receptor Categories

20.3.18 In the first instance, common sensitive receptor categories were evaluated for each committed development in terms of their broad receptor category, in accordance with Regulation 4(2) of the EIA Regulations 2017, e.g. the environmental topics assessed as part of the EIA (or Environmental Information) that accompanied the application.

20.3.19 Common sensitive receptor categories were then categorised in line with the topics set out in Chapters 6 to 19 of this ES. The common sensitive receptor categories were then identified and evaluated as they relate to each committed development, ensuring that In-Combination Effects were duly considered at the common sensitive receptor category level. For example, if the EIA that accompanied the committed development reported significant ecology effects, these were considered cumulatively with the ecology effects set out in **Chapter 10: Biodiversity** (Document Reference: 3.10.00) and **Chapter 11: Bats** (Document Reference: 3.11.00) of this ES.

20.3.20 A more detailed level of assessment was only undertaken where a common sensitive receptor category or single sensitive receptor was identified and there was considered a potential for likely significant cumulative effects e.g., where a committed development was considered to have potential to have cumulative visual impacts / effects, these were assessed cumulatively with the relevant reported residual visual effects from the Proposed Scheme.

20.3.21 Some common sensitive receptor categories were not considered further as part of the CEA. **Table 20-3** below sets out the common receptor categories which were assessed further as part of this CEA with justification provided where these have not been assessed further.

Table 20-3 Sifting of common sensitive receptor categories

Receptor Category	Commentary	Assessed Further as part of CEA
Air Quality	The assessment in **Appendix 6.8 Assessment of Cumulative Impacts** (Document Reference: 3.06.08) of **Chapter 8: Air Quality** (Document Reference: 3.06.00) has assessed the committed developments in-combination with the Proposed Scheme and concludes that there is no potential for likely significant effects	**No**
Noise and Vibration	The assessment in **Appendix 7.7 Assessment of Cumulative Impacts** (Document Reference: 3.07.07) of **Chapter 7: Noise and Vibration** (Document Reference: 3.07.00) has assessed the committed developments in-combination with the Proposed Scheme and concludes that there is no potential for likely significant effects	**No**
Cultural Heritage	The assessment in **Appendix 8.6 In-Combination Assessment** (Document Reference: 3.08.06) of **Chapter 8: Cultural Heritage** (Document Reference: 3.08.00) has assessed the committed developments in-combination with the Proposed Scheme and concludes that there is no potential for likely significant effects.	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Landscape and Visual Effects	In-Combination Effects on both identified landscape classifications and the viewpoints assessed in **Appendix 9.2 LVIA In-Combination Assessment** (Document Reference: 3.09.02) of **Chapter 9: Landscape and Visual** (Document Reference: 3.09.00) of this ES have been taken forward as part of this CEA.	**Yes**
Biodiversity	The identified committed developments have been reviewed where possible using publicly available sources of information and are noted to potentially directly or indirectly impact Biodiversity at one location along the route of the Proposed Scheme. This assessment is presented in **Appendix 36 Cumulative Impacts from Nearby Committed Developments** (Document Reference: 3.10.36) of **Chapter 10: Biodiversity** (Document Reference: 3.10.00) of this ES. The In-Combination Effects on Biodiversity may be locally significant and therefore are further assessed as part of this CEA.	**Yes**

Receptor Category	Commentary	Assessed Further as part of CEA
Bats	For **Chapter 11: Bats** (Document Reference: 3.11.00) of this ES, the in-combination assessment presented in **Appendix 11.8 In-Combination Assessment** (Document Reference: 3.11.08) was informed by a larger committed development dataset from a 6km Study Area that captured smaller developments such as barn conversions that are pertinent to the bat assessment. Therefore, this assessment is not included within this Cumulative Chapter, the sifting and in-combination assessment of this 6km committed development dataset can instead be found in **Appendix 11.8 In-Combination Assessment** (Document Reference: 3.11.08) of **Chapter 11: Bats** (Document Reference: 3.11.00).	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Road Drainage and Water Environment	The in-combination assessment presented in **Appendix 12.7 In-Combination Assessment** (Document Reference: 3.12.07) of **Chapter 12: Road Drainage and Water Environment** (Document Reference: 3.12.00) has assessed the committed developments using publicly available sources of information in-combination with the Proposed Scheme. This assessment concludes that assuming the committed developments implement appropriate and robust mitigation measures and given the distance of some of the developments from the Proposed Scheme, it is unlikely that significant cumulative In-Combination Effects on road drainage and water environment receptors would occur.	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Geology and Soils	**Chapter 13: Geology and Soils** (Document Reference: 3.13.00) of this ES reports no significant residual effects in relation to Human Health, Built Environment, Groundwater and Surface Water during either the construction or operational phases. Upon reviewing the available environmental information, no potential impacts from the identified committed developments have been identified which overlap with the likely significant residual effects of the Proposed Scheme. No further assessment has therefore been undertaken as part of this CEA.	**No**
Material Assets and Waste	The assessment in **Appendix 14.1 In-Combination Assessment** (Document Reference: 3.14.01) of **Chapter 14: Material Assets and Waste** (Document Reference: 3.14.00) of this ES has assessed the committed developments in-combination with the Proposed Scheme and concludes that there is no potential for likely significant effects.	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Climate Greenhouse Gases	The assessment in **Chapter 15: Climate Greenhouse Gasses** (Document Reference: 3.15.00) considers the cumulative effect of all GHG causing human activities that cause climate change, and therefore the assessment of the GHGs due to the Proposed Scheme inherently assesses the cumulative effect of GHG emissions. Therefore, the quantification of emissions from the Proposed Scheme in the assessment of significance or effects inherently assesses the In-Combination Effects. No further assessment has therefore been undertaken as part of this CEA.	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Climate Resilience	The assessment in **Chapter 16: Climate Resilience** (Document Reference: 3.16.00) looks at the potential impacts of environmental change on the Proposed Scheme, rather than impacts of the Proposed Scheme on the environment: the receptor for the resilience assessment is the Proposed Scheme. Any climate hazards that have been assessed as part of the ES will be considered in the topic chapters, and the potential impacts from the identified committed developments on Proposed Scheme will be assessed there. No further assessment has therefore been undertaken as part of this CEA for Climate Resilience.	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Population and Human Health	**Chapter 17: Population and Human Health** (Document Reference: 3.17.00) of this ES has assessed the committed developments in-combination with the Proposed Scheme as presented in **Appendix 17.1 In-Combination Assessment** (Document Reference: 3.17.01) and has identified the potential for temporary significant adverse effects due to access disruption. In-Combination Effects for this chapter have therefore been considered as part of this CEA for further assessment.	**Yes**

Receptor Category	Commentary	Assessed Further as part of CEA
Major Accidents and Disasters	**Chapter 18: Major Accidents and Disasters** (Document Reference: 3.18.00) of this ES assessed a 300 m corridor either side of the Proposed Scheme in order to capture internal and external influencing factors which may have high adverse consequences on the Proposed Scheme. At the scoping stage, a 2.5 km corridor either side of the Proposed Scheme was used, which identified the key factors to be within 300 m and as such the Study Area was reduced. The Chapter states that "For the potential major accident(s) and / or disaster(s) (MA&D) events identified, the assessment concluded there is no likely requirement for further mitigation measures, based on the detail currently available in other relevant ES chapters, it is considered that the risks are as low as reasonably practicable". The Chapter has, by its very nature, implicitly considered interactions with external factors such as other proposed developments. This assessment approach, which considers the vulnerability of the Proposed Scheme to MA&D events, does not assess potential cumulative effects on sensitive receptors because such events are rare and isolated, which would not be anticipated to act together with other impacts.	**No**

Receptor Category	Commentary	Assessed Further as part of CEA
Traffic and Transport	The cumulative effects of other developments during the operational phase have already been considered as part of the relevant chapters, as the traffic data used within the topic-specific modelling has incorporated any anticipated increases in traffic flows as a result of all relevant developments. The potential for adverse In-Combination Effects with the committed developments is considered likely (for construction) in relation to the onshore cable routes for the Hornsea Project 3 Offshore Wind Farm, Norfolk Boreas Offshore Wind Farm and Equinor Sheringham Shoal & Dudgeon Wind Farm Extension Projects. For a more detailed assessment of the cumulative impacts from these developments, please refer to **Chapter 19: Traffic and Transport** (Document Reference: 3.19.00).	**Yes**

Stage 3 – Assessment of In-Combination Effects

20.3.22 Once the committed developments were identified, screened and common sensitive receptor categories defined, consideration was given to their tolerance to effects.

20.3.23 The sources of construction and operational activities In-Combination with the Proposed Scheme were then assessed. In order for there to be a potential In-Combination Effect, there needs to be a potential effect on the same common receptor category for a similar duration within the overall programme.

20.3.24 The qualitative evaluation considered the following:

- Combined magnitude of change;
- Sensitivity / value / importance of the common receptor category / receiving environment to change; or / and
- Duration and reversibility of effect.

20.3.25 Through a combination of the qualitative evaluation and mitigation presented in the ES, conclusions were drawn as to the likelihood for significant In-Combination environmental effects.

20.3.26 Section 20.5.2 below reports only the significant In-Combination residual effects with the full assessment and reporting of residual effects provided in **Appendix 20.2 Committed Developments - In-Combination Effects Assessment** (Document Reference: 3.20.02).

20.4 Assessment Limitations and Assumptions

Limitations and Assumptions

20.4.1 To ensure transparency within the EIA process, the following limitations and assumptions have been identified:

- The assessment of Effect Interactions resulting from the Proposed Scheme is focused on the residual effects from the construction and operational phases following the implementation of mitigation

measures (both embedded and additional). It will be assumed that identified mitigation measures set out in Chapters 6 to 19 of this ES would be incorporated or adopted to mitigate as far as reasonably practicable adverse effects resulting from the Proposed Scheme;

- The CEA is based on publicly available information only. The assessment of In-Combination Effects has been based on the interpretation and assessment of data provided by third parties available in the public domain and no survey work to supplement information of committed or other relevant developments has been undertaken. Committed development S14 was raised through landowner discussions as an exception and was covered on a precautionary basis;
- The list of committed developments as set out in **Appendix 20.2 Committed Developments - In-Combination Effects Assessment** (Document Reference: 3.20.02) was finalised on the 23rd of February 2024 to allow for assessment within the ES. Any planning applications, status updates or additional information published since this date have not been included within the assessment; and
- Where the listed Committed Developments were not subject to formal EIA, in most instances information is lacking on the likelihood of reported significant effects. Professional judgement and a review of the environmental information submitted with the relevant application has been undertaken to identify potential common receptors categories that have potential for In-Combination Effects.

20.5 Description of likely significant cumulative effects

Effect Interactions

20.5.1 **Table 20-4** (Construction) and **Table 20-5** (Operation) summarise the potential residual Effects of the Proposed Scheme, following the implementation of the mitigation measures set out in Technical Chapters 6 to 19 of this ES, and the Interactions of these Effects for each common receptor group.

Table 20-4 Residual Effect Interactions – Construction Phase

Common Receptor Groups/Specific Named Receptors	Potential Residual Effects during Construction	Residual Effects Interaction
Residents	There would be **slight adverse** to **large adverse (temporary)** Population and Human Health effects to residents due to severance and reduction in accessibility to numerous properties, businesses, and Agricultural Land Holdings. Residents would experience **Significant adverse** construction noise effects on Mouse Wood Farm, Pump Farm, Peacehaven, Deighton Hills House and Woodstock. There would be **slight adverse** to **moderate-large adverse (temporary)** visual impacts to residential receptors due to visual intrusion of construction activities. **Negligible to minor adverse (temporary)** traffic and transport effects to residents have been identified due to disruption to journeys and driver delay.	The health and amenity of residents living along the Proposed Scheme have the potential to be negatively affected during construction. Annoyance due to noise from traffic and construction, visual disturbance, disruption to access to services, and disruption to journeys could combine to result in adverse effects on residents causing lower levels of quality of life and wellbeing during construction. The identified residual effects would be short-term and temporary during construction. There would therefore be a **Moderate adverse (temporary) significant** in-combination effect on residents during construction.
Users of PRoWs and WCH	This common receptor group is likely to experience **moderate to moderate-large adverse (temporary)** visual effects on two PRoWs (Weston Longville FP9 and Honingham RB1). **Slight adverse** to **moderate adverse (temporary)** Population and Human Health effects have been identified due to changes in accessibility for users of PRoWs and WCH. **Negligible to minor adverse (temporary)** Traffic and Transport effects are anticipated due to severance and increased journey times.	Users of PRoWs may experience significant Effect Interactions associated with visual disruption, reduced accessibility, delay, and changes to routes during the construction phase. The identified residual effects would be short-term and temporary during construction. There would therefore be a **Moderate adverse (temporary) significant** in-combination effect on users of PRoWs and WCH during construction

Table 20-5 Residual Effect Interactions – Operational Phase

Common Receptor Groups / Specific Named Receptors	Potential Residual Effects during Operation	Residual Effects Interaction
Residents	**Significant adverse (permanent)** residual noise and vibration effects have been identified for residential receptors in groups 6 and 7; and Receptors within 50m of Taverham Road, Fir Covert Road (north of A1270), A1270 (west of Broadland Northway Roundabout), Station Road (through Attlebridge), Old Fakenham Road and Mattishall Lane (between A47 and Burgh Lane), due to increased traffic noise during operation. There would be **slight adverse (permanent)** residual visual effects for receptors R1, R2, R3, R5, R8, R9, R10 and R12 due to the visual intrusion of the Proposed Scheme once operational. There would be **slight adverse** to **large adverse (permanent)** impacts to Agricultural Land Holdings due to land take and severance from the footprint of the Proposed Scheme once operational.	The health and amenity of residents living along the Proposed Scheme have the potential to be negatively affected during operation. Annoyance due to noise from increased traffic levels, visual intrusion and disruption in access to properties and land could combine to result in adverse effects on residents causing lower levels of quality of life and wellbeing. Severance and land take may impact the operation of agricultural businesses. Several of the individual receptors are geographically proximal and there would therefore be a **minor adverse (permanent) not significant** residual in-combination effect on these residents during operation. The Proposed Scheme, however, once operational, would deliver broad beneficial impacts to residents, as a result of improved journeys.

Common Receptor Groups / Specific Named Receptors	Potential Residual Effects during Operation	Residual Effects Interaction
Users of PRoWs and WCH	Slight adverse to slight-moderate adverse (permanent) residual landscape and visual impacts to users of Honingham FP5 / Weston Longville FP9 and Honingham RB1 have been identified due to the visual intrusion of the Proposed Scheme once operational. There would be Moderate Adverse (permanent) residual Population and Human Health effects on users of Honingham RB1, Breck Road, Weston Road and Blackbreck Lane due to changes in accessibility. Minor Adverse (temporary) residual Traffic and Transport effects have been identified to PRoW and WCH users of Brick Kiln Road, Bell Road, Burgh Lane, South Green / Mill Street and the A47 at opening year. Minor Adverse (permanent) residual Traffic and Transport effects have been identified to PRoW and WCH users of Bell Road, Low Road, Burgh Lane and South Green / Mill Street at year 15.	Users of the Honingham RB1 PRoW may experience Effect Interactions associated with visual intrusion of the Proposed Scheme, reduced accessibility and changes to journeys. There would therefore be a **Minor adverse (permanent) not significant** effect to users of this ProW as a result of the operation of the Proposed Scheme. The Proposed Scheme, however, once operational, would deliver broad beneficial impacts to users of PRoWs and WCH, as a result of improved access and safety improvements.

In-Combination Effects

20.5.2 A full assessment of potential In-Combination Effects during the construction and operational phases of the Proposed Scheme is provided in **Appendix 20.2 Committed Developments – In-Combination Effects** (Document Reference: 3.20.02).

20.5.3 A summary of the committed developments that are considered likely to result in significant residual In-Combination Effects (Moderate and above) in the identified common sensitive receptor category, greater than those reported in Chapters 6 to 19 of this ES are reported below in **Table 20-5** (construction phase) and **Table 20-6** (operational phase).

Table 20-6 Significant In-Combination Effects – Construction Phase

Development and Planning Reference No.	Common Sensitive Receptor Category	Residual In-Combination Effects
Planning Ref: 20201332. Earth Bund directly north of the Northern Distributor Road (A1270), land that lies between the Fakenham Road and Fir Covert Road junctions. DCO: Hornsea Project Three Offshore Wind Farm and onshore cable route DCO: Equinor Sheringham Shoal & Dudgeon Wind Farm Extension Project and onshore cable route.	Population and Human Health	Should the construction of the Proposed Scheme fall within the same timeframe with the Earth Bund committed development, a temporary **moderate adverse** In-Combination Effect (significant) is anticipated on Mid Norfolk Shooting Ground due to potential temporary access disruption from the potential road closure of the A1270 Broadland Northway. Should the construction of the Proposed Scheme fall within the same timeframe with the Hornsea 3 committed development, a temporary **moderate adverse** In-Combination Effect (significant) on the WCH routes of Blackbreck Lane and Weston Longville FP9 due to access disruption is anticipated to facilitate the construction of the schemes. Should the construction of the Proposed Scheme fall within the same timeframe with the Equinor committed development, a temporary **moderate adverse** In-Combination Effect (significant) on users of Weston Road is anticipated due to potential access disruptions to facilitate the construction of the schemes.
A47 DCO – Proposed dual carriageway A47 North Tuddenham to Easton.	Landscape and Visual	**Chapter 9: Landscape and Visual** (Document Reference: 3.09.00) of this ES reports that development is likely to impact the Landscape Character of the Area (LCA). Whilst there is an existing road currently in place, the realignment of the A47 along with the scale and nature of the A47 dualling would potentially impact the character of the area. Construction of the A47 dualling is likely to take place alongside the construction of the Proposed Scheme. The construction of the Proposed Scheme is likely to be read collectively with the construction works at A47 as one entity, resulting in an extended area of visual intrusion and change in Broadland LCA D2 Weston Green Tributary Farmland with overall adverse effect on the character of the LCA as a result of the presence of machinery such as cranes, boring drills, and HGVs. This is likely to impact upon the local landscape character, and medium and longer distance views within LCA. The overall cumulative In-Combination Effect on landscape character and visual amenity is therefore considered to be of **moderate-high (adverse)** significance, but temporary in nature. The A47 dualling will also run through Breckland LCA A5 Landscape River Valley Upper Tud Valley and a small portion to the south of B6 River Wensum and Tud Tributary Farmland. The cumulative impact of the Proposed Scheme with the A47 dualling on LCA B6 River Wensum and Tud Tributary Farmland would remain negligible due to the geographical extent and location of the schemes at the southern edge of the LCA. Whilst the impact of the Proposed Scheme on LCA A5 Landscape River Valley Upper Tud Valley in isolation is considered to be negligible, the cumulative In-Combination Effect impact of construction activities with those of the A47 dualling on landscape character and visual amenity in the LCA is likely to be **moderate adverse (significant).**
DCO: Sheringham and Dudgeon Extension Projects.	Traffic and Transport	**Chapter 19: Traffic and Transport** (Document Reference: 3.19.00) of this ES outlines a worst-case scenario for the peak construction traffic associated with the Equinor Sheringham & Dudgeon Wind Farm Extension Project combined with the peak construction period of the Proposed Scheme to estimate the magnitude of impact. The assessment has indicated a high magnitude and moderate cumulative effect significance on severance and amenity on Ringland Lane during construction.

Table 20-7 Significant In-Combination Effects – Operational Phase

Development and Planning Reference No.	Common Sensitive Receptor Category	Residual In-Combination Effects
A47 DCO – Proposed dual carriageway A47 North Tuddenham to Easton.	Landscape and Visual	**Chapter 9: Landscape and Visual** (Document Reference: 3.09.00) of this ES reports that the A47 dualling is expected to be visible to and from the southern extent of the Proposed Scheme once built. The dualling of the A47 will introduce dualling of the single carriageway section of the A47 between Norwich and Dereham, linking together two existing sections of dual carriageway, realigned in part through open agricultural fields, along with new junctions. It is likely to result in a **moderate-high** (adverse) in-combination effect on the landscape character and visual amenity of Broadland LCA D2 Weston Green Tributary Farmland on a winter's day at Year 1 due to the geographical extent and likely visibility of the schemes in combination within the LCA. At Year 15, following the establishment of planting proposed by each scheme, the cumulative impact of the Proposed Scheme alongside the A47 dualling is likely to reduce to **slight adverse**. The cumulative impact of the Proposed Scheme and A47 dualling at operation on Breckland LCA B6 River Wensum and Tud Tributary Farmland is likely to be negligible. The cumulative impact of the Proposed Scheme and A47 dualling at operation on Breckland LCA A5 Landscape River Valley Upper Tud Valley is likely to be moderate adverse and reduce to slight adverse following the establishment of planting.