Tween Bridge Solar Farm

Environmental Statement
Chapter 17: Cumulative Impacts

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

APFP Regulation 5(2)(a)

Document Reference: 6.2.17

September 2026

Revision 4

Table of Contents

17. Cumulative Impacts 3

17.1. Introduction 3
17.2. Consultation 4
17.3. Assessment Approach 13
17.4. Cumulative Effects Assessment 37
17.5. In Combination Effects 106
17.6. Summary 123
17.7. References 132
17.8. Glossary 132

List of Tables

Table 17-1 Summary of Consultation – Scoping Opinion 5

Table 17-2 Summary of Consultee Responses from Scoping 7

Table 17-3 Summary of Consultation - Statutory Consultation 10

Table 17-4 Summary of the four stage process for cumulative effect assessment 13

Table 17-5 Zone of Influence 15

Table 17-6 Details of Shortlisted Cumulative Schemes 23

Table 17-7 Significance of Effect Criteria Table for Cumulative Effects 30

Table 17-8 In-combination effects intrinsically assessed as part of the standard assessment approach for each ES Environmental Aspect Chapter 34

Table 17-9 Details of Shortlisted Cumulative Schemes considered in Landscape and Visual Cumulative Assessment 37

Table 17-10 Ground Conditions Cumulative Effects Assessment 45

Table 17-11 Cumulative assessment - scope of potential effects and worst-case assumptions in respect of socio-economics 57

Table 17-12 Scope of Cumulative Assessment, Socio-Economics 60

Table 17-13 Figures and Estimates Associated with Cumulative Schemes 71

Table 17-14 Assumptions used for basis of Cumulative Assessment – inclusive of Scheme and Cumulative Schemes 73

Table 17-15 Assumed Occupancy of Accommodation including construction workers across all three districts – Effects on Visitors 78

Table 17-16 Assumed Occupancy of Accommodation including construction workers across all three districts – Effect on Local Tourism Sector 82

Table 17-17 Assumed Occupancy of Accommodation including decommissioning workers across all three districts – Effect on Visitors 88

Table 17-18 Assumed Occupancy of Accommodation including decommissioning workers across all three districts – Effect on Local Tourism Sector 92

Table 17-20 Cumulative Assessment of Link Three 95

Table 17-21 Assessment of In-Combination Effect Interactions During Construction and Decommissioning 108

Table 17-22 Assessment of In-Combination Effect Interactions During Operation 115

Table 17-23 Summary of Cumulative Effects 123

Table 17-24 Summary of In-Combination Effects 130

17. Cumulative Impacts

17.1. Introduction

17.1.1. This chapter of the Environmental Statement (ES) considers the potential for cumulative effects arising as a result of the Scheme.

17.1.2. Cumulative effects are the result of multiple actions on environmental receptors. Within Environmental Impact Assessment (EIA), cumulative effects are generally considered to arise from:

- Cumulative Effects: The cumulation of effects of the Scheme with other existing and, or approved projects which may, on an individual basis be insignificant but, cumulatively, have potentially significant effects; and
- In Combination Effects: arising from the interrelationships between different environmental effects of the Scheme (for example noise, airborne dust or traffic) on a single receptor where deemed potentially significant.

17.1.3. Cumulative effects occur when a resource, receptor or group of receptors are potentially affected by more than one scheme at the same time. For example, construction phase transport effects may be minimal when considering a scheme in isolation, but when considered with other schemes in the wider vicinity the combined transport effect could be larger and potentially significant.

17.1.4. In combination effects, occur where a resource, receptor or group of receptors are potentially affected by more than one source of environmental effect as a result of a singular development, for example during the construction period a receptor may be affected by noise, airborne dust and traffic.

17.1.5. This ES chapter is supported by the following appendices:

- **ES Appendix 17.1 Cumulative Long List [Document Reference 6.3.17.1 Revision 2]**
- **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]**
- **ES Appendix 17.3 Transport Assessment Table [Document Reference 6.3.17.3 Revision 2]**
- **ES Appendix 17.4 - Ecology Cumulative Assessment Table [Document Reference 6.3.17.4 Revision 2**]

17.1.6. The chapter is also supported by

- **ES Figure 17.1 Cumulative Sites Plan [Document Reference 6.4.17.1 Revision 2]**.

17.1.7. This ES Chapter and supporting appendices and figures have been prepared by competent experts. Lead authors from each technical discipline area presented in this ES have contributed to this assessment and provide discussion for their technical specialism. Full details of the competent experts are provided in **ES Appendix 1.3 [APP-059]**.

17.1.8. At Deadline 6 of the Examination Stage of the DCO Application, a review and update of the cumulative long list (**ES Appendix 17.1 Cumulative Long List [Document Reference 6.3.17.1 Revision 2]**) and short list (**ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]**) has been undertaken to identify any changes in status of the identified projects in the cumulative long list and short list and if there are any new cumulative schemes of relevance to include. This review was undertaken and the list of cumulative schemes updated and frozen in August 2026.

17.1.9. The review identified some changes in the status of projects in the existing cumulative short list. This includes cumulative schemes that were 'Pending Decision' and are now determined as 'Granted' or 'Refused'/ 'Withdrawn', or those cumulative schemes under the NSIP regime may have moved status from 'Pre-Application' to 'Examination' stage or are now determined. Those cumulative schemes that have had a change in status and are included, as relevant, in the cumulative effects assessments within this chapter have not required any changes to the assessment. For example, those cumulative schemes with a status changed from 'Pending Decision' to 'Granted' have accordingly been assessed on a worst-case scenario basis in the original assessment of being granted and the cumulative scheme coming forward. Those cumulative schemes that have subsequently been refused or withdrawn are still retained within the cumulative effects assessment for completeness, should there be an appeal and the project ultimately proceeds.

17.1.10. Six new cumulative schemes have progressed to the short list and are updated accordingly in **Table 17-6** and assessed within environmental topic sections in this chapter, as relevant. The new cumulative schemes are illustrated in **ES Figure 17.1 Cumulative Sites Plan [Document Reference 6.4.17.1 Revision 2]**.

17.2. Consultation

Scoping

17.2.1. The EIA Scoping Report, submitted in January 2023, set out the proposed scope and assessment methodologies for the EIA and is included in **ES Appendix 1.2 Applicant's EIA Scoping Report [APP-058]**. The Planning Inspectorate provided their Scoping Opinion on the 13 March 2023, this is provided in **ES Appendix 1.1 Planning Inspectorate's EIA Scoping Opinion [APP-057]**.

17.2.2. The Applicant's Scoping Report set out that cumulative effects were scoped into the assessment and would be assessed within each ES Environmental Aspect Chapter. The following table provides a summary of the Planning Inspectorate's advice from the Scoping Opinion in regard to cumulative effects and where this has been addressed in the chapter.

Table 17-1 Summary of Consultation – Scoping Opinion

Id	Ref	Matter	Summary Of Planning Inspectorate Comments	Applicant's Response
2.2.3	Paras 3.20 and 3.21	Cumulative effects	It is recommended that the cumulative assessment follows the methodology set out in the Inspectorate's Advice Note Seventeen. Specific other developments for inclusion in the cumulative assessment have not been identified at this stage and effort should be made to agree these with relevant consultation bodies including the host local planning authorities.	The methodology set out in **Section 17.3** follows the methodology set out in the Planning Inspectorate's Advice Note Seventeen **[Ref 17-1]**. The developments considered within the cumulative assessment are set out in **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]**
2.2.4	n/a	Study area(s)	The ES should, for each aspect chapter, clearly define and justify the	The Zone of Influence for each ES Environmental

			study area(s) used for the assessment of effects from the Proposed Development alone and cumulatively with other development. The study area(s) should be represented on accompanying figures.	Aspect Chapter is set out in **Table 17-5** of this chapter which has been considered as part of the cumulative assessment.
3.9.1	Paras 8.28 and 8.29	Assessment of cumulative effects	The Scoping Report does not provide any evidence to justify the conclusion of "nil detriment" in terms of offsite/ downstream hydrogeology related impacts from the Proposed Development. Specific other developments for inclusion in the ES cumulative assessment have also not been identified at this stage. The Inspectorate is therefore not in a position to agree that this matter can be scoped out. The Hydrology and Flood Risk ES Chapter should identify relevant other developments within the catchment with potential to result in cumulative impacts on hydrological, hydrogeological and flood risk	Other development considered cumulatively as part of the Hydrology and Flood Risk assessment are identified in **Table 17-6** and **Paragraphs 17.4.33 – 17.4.36** provides the cumulative assessment on hydrological, hydrogeological and flood risk receptors.

			receptors. Any likely significant cumulative effects should be assessed.	
3.14.1	Para 13.20	Cumulative schemes	The Scoping Report proposes to exclude sites of less than 20ha in area from the list of cumulative schemes. The Inspectorate considers that insufficient justification is provided within the Scoping Report and as such cannot agree to scope schemes of this scale out of assessment at this stage. Other development to be included in the cumulative effects assessment should be agreed with relevant consultation bodies including the host local planning authorities.	**Section 17.3** sets out the methodology for how cumulative schemes have been identified, which includes sites of less than 20ha.

17.2.3. Other consultee responses received as part of the Scoping exercise are summarised below.

Table 17-2 Summary of Consultee Responses from Scoping

Statutory Consultee	Summary of response on cumulative assessment	How Response has been Addressed by Applicant
Historic England	Cumulative effects on the significance of designated and non-designated heritage assets and the landscape character should be thoroughly analysed	The Zone of Influence for landscape and visual and heritage assessment are set out in **Table 17-5** and the cumulative assessment for each of

	and presented in the ES. Cumulative effects of the development alongside those of other proposed developments in a defined geographic proximity to the project; and, cumulative effects for a single receptor where multiple impacts are predicted to arise from the scheme, should be considered	these ES Environmental Aspect Chapters is set out in **Paragraph 17.4.1 – 17.4.10** and **17.4.28 – 17.4.30**.
Natural England	It will be important for any assessment to consider the potential cumulative effects of this proposal, including all supporting infrastructure, with other similar proposals and a thorough assessment of the 'in combination' effects of the proposed development with any existing developments and current applications. A full consideration of the implications of the whole scheme should be included in the ES. All supporting infrastructure should be included within the assessment.	The methodology is set out in **Section 17.3** and confirms the cumulative developments considered as part of the assessment, these are also set out within the cumulative assessment are set out in **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]**
	The ES should include an impact assessment to identify, describe and evaluate the effects that are likely to result from the project in combination with other projects and activities that are being, have been or will be carried out. The following types of projects should be included in such an assessment, (subject to available information): a. existing completed projects;	

	b. approved but uncompleted projects; c. ongoing activities; d. plans or projects for which an application has been made and which are under consideration by the consenting authorities; and e. plans and projects which are reasonably foreseeable, i.e., projects for which an application has not yet been submitted, but which are likely to progress before completion of the development and for which sufficient information is available to assess the likelihood of cumulative and in-combination effects.	

Preliminary Environmental Information Report (PEIR)

17.2.4. Engagement in relation to cumulative effects has been undertaken with a number of stakeholders throughout the EIA process. Stakeholder and local authorities have had the opportunity to comment on the methodology of the cumulative assessment both through the publication of the Preliminary Environmental Information Report (PEIR) in March 2025 as part of statutory consultation. As part of this, both the cumulative long list **[ES Appendix 17.1 Cumulative Long List [Document Reference 6.3.17.1 Revision 2]** and the cumulative short list **[ES Appendix 17.2 Cumulative Short List[Document Reference 6.3.17.2 Revision 2]** were provided.

17.2.5. Both the Scoping Report and the documents provided as part of the PEIR included the cumulative assessment within the ES Environmental Aspect Chapters. It has since been decided to present this information in an individual chapter as part of the ES to provide a clear assessment of both the potential cumulative and in combination effects as a result of the Scheme.

17.2.6. **Table 17-3** provides a summary of the responses from consultees relevant to the cumulative assessment.

Table 17-3 Summary of Consultation - Statutory Consultation

Statutory Consultee	Summary of response on cumulative assessment	How Response has been Addressed by Applicant
City of Doncaster Council	CDC are happy with the approach taken to cumulative developments as set out in Chapter 3 of the PIER. The Applicant may also wish to note that currently under consideration is a proposal for a solar farm at Marr, reference 23/02634/FULM. Whilst at this stage, this does not constitute a committed development, the Applicant should keep this under review as the EIA work progresses. Furthermore, CDC has recently issued a Screening Opinion under reference 24/00592/SCRE for ground mounted solar energy and battery energy storage development. Again, at this time this is not committed development for the purposes of EIA, but it may be worth continuing to monitor as CDC expect the application to be submitted imminently (notwithstanding determination dates are unknown at this time).	Given the distance between the Order Limits and these two developments it is not considered relevant to include them in the cumulative short list at this stage. Both schemes are over 16km from the Order Limits and are separated by the intervening built form of the City of Doncaster and the associated development and roadways and therefore significant cumulative effects with the Scheme are not likely.
Lincolnshire County Council	LCC notes that consideration of Cumulative effects is proposed to be presented in the ES and	A cumulative short list was provided as part of the PEIR documents, this has

	that baseline and assessment work is ongoing (PEIR Chapter 16, paragraph 16.1.14). LCC welcomes the Applicant's intentions to seek to agree a list of cumulative developments with relevant planning authorities, in order to identify likely significant effects. Projects to be assessed in combination with Tween Bridge as part of the cumulative assessment should be kept under regular review as the proposal progresses, to identify any new developments that come forward which may interact with the development. Please note that the Zone of Influence for cumulative impacts may geographically and/or temporally differ.	been reviewed and updated for the ES and is provided as **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]**.
	LCC appreciates the commitment to assess cumulative effects for waste arisings, particularly as there are a number of solar NSIP proposals in the north of the LCC area.	Cumulative waste assessment is provided in **Paragraph 17.4.126-17.4.128**.
	Temporary workforce matters must be considered, in relation to cumulative impacts from other schemes in the region which will also have a temporary construction workforce. Section 11.8 of the PIER does mention accommodation demand, which is welcome, but this is implied only at the Doncaster and North Lincolnshire level when clearly	Cumulative assessment of temporary workforce matter provided in **Paragraph 17.4.36 – 17.4.76**

	accommodation demand could be in parts of the County of Lincolnshire too. There also needs to be consideration of other cumulative impacts of NSIPs in the region regarding skills/workforce availability and commuting profiles. There are several development proposals of varying scales in the vicinity of this proposals including other solar developments. A detailed assessment of the cumulative impacts of these proposals on sensitive ecological receptors in the area should be undertaken in the ES. This should include habitat change, as well as the magnitude of change, that will result from conversion of arable farmland to solar farm, alongside the other solar NSIP projects in the area.	Cumulative assessment of ecological matters provided in **Paragraphs 17.4.16 – 17.4.27**.
UK Health Security Agency	Queried if cumulative impacts on emissions to air by nearby schemes is still a consideration, if this is no longer a consideration request this is noted at the next stage.	Cumulative assessment on emissions to air provided in **Paragraphs 17.4.111– 17.4.118**.
North Lincolnshire Council	Noted concerns relating to the decimation of the agricultural nature of the area due to the cumulative effect of multiple schemes.	Cumulative assessment on agricultural circumstances provided in **Paragraphs 17.4.119 – 17.4.121**.
Natural England	Advise that when considering in-combination impacts of loss of	Cumulative assessment of ecological matters

	functionally linked land, the results of surveys undertaken for those developments should also be taken into account to understand whether there is a cumulative loss of land which can support wintering or passage birds.	provided in **Paragraphs 17.4.16 – 17.4.27**.

17.2.7. Rotherham Metropolitan Council, North Yorkshire Council and East Riding of Yorkshire Council were also consulted and responded that they had no comments.

17.3. Assessment Approach

Methodology and Approach

17.3.1. In accordance with the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations), the Applicant has considered cumulative effects. Cumulative impacts are those effects of the Scheme that may interact in an additive or subtractive manner with the impacts of other developments including those that are not currently in existence but may be by the time the Scheme is implemented. Examples of these kinds of effects that can be readily appreciated could include:

- Traffic generated from developments, affecting the surrounding road network;
- Air quality effects from developments; and
- Discharges to the water environment.

17.3.2. The scope of cumulative assessment includes identification of a long list of development within the appropriate Zone of Influence (ZoI) for each topic discipline, which will form the basis of the search area for the cumulative effects assessment. The cumulative effects assessment draws upon the method as set out within Planning Inspectorate's Advice Note on Cumulative Effects Assessment, published in August 2019 and updated in March 2025 **[Ref 17-1]**. **Table 17-4** identifies the four stage process to assess cumulative effects.

Table 17-4 Summary of the four stage process for cumulative effect assessment

Cumulative Effect Assessment Stage	Description of Stage
Stage 1	Establish the Scheme's Zone of Influence and identify long list of 'other existing and, or approved developments.
Stage 2	Identify shortlist of 'other existing and, or approved development' for Cumulative Effects Assessment.
Stage 3	Information gathering of the 'other existing and, or approved developments' shortlisted at Stage 2.
Stage 4	An assessment of the likely cumulative effects of the Scheme with the other existing and, or approved development identified in Stages 1 to 3. Mitigation measures are identified (where appropriate) where an adverse cumulative effect is identified. As a minimum, the assessment should include the mitigation necessary to address impacts associated with the Scheme. The apportionment of effect between the Scheme and the 'other existing and, or approved developments' is considered, e.g., whether the contribution to the effect is demonstrably related to one development or whether there is an equal contribution from each development.

Stage 1 – Establishing the long list of other existing and, or approved development

17.3.3. In accordance with the Planning Inspectorate's Advice Note on Cumulative Effects Assessment **[Ref 17-1]** the first task in establishing the long list of relevant other existing development and/or approved development(s) is to determine the 'search area'. For the purposes of this assessment, the 'search area' has been determined by affording consideration to the Zone of Influence for each ES Environmental Aspect Chapter.

Zone of Influence

17.3.4. The proposed 'Zone of Influence' for each environmental topic area has been identified based on the extent of likely effects as identified as the study area in each of the ES Environmental Aspect Chapters. The 'Zone of Influence' has been proposed in line with industry specific guidance along with professional judgement and knowledge of the local area relevant to each ES Environmental

Aspect Chapter. The identified 'Zone of Influences' are presented in **Table 17-5** below for the ES Environmental Aspect Chapters.

Table 17-5 Zone of Influence

ES Environmental Aspect	Proposed Zone of Influence
Landscape and visual	Landscape and visual receptors: 3km from the Order Limits
Residential visual amenity	Residential receptors: up to 500m from the Order Limits.
Nature Conservation and Biodiversity	• International statutory designated sites: 10km from Order Limits; • National statutory designated sites: 5km from Order Limits; • Non-statutory designated sites: 2km from Order Limits ; • Protected/Priority/Notable species records: 2km from Order Limits; • Habitat, water vole & otter and invertebrate scoping surveys: within the Order Limits; • Great crested newt survey: Order Limits and extending to 250m; • Breeding bird survey: Order Limits and extending to 100m; • Non-breeding bird survey: Order Limits and extending to 600m; • Nightjar survey; focussed within Thorne & Hatfield Moors situated within and adjacent to the Order Limits; and, • Badger survey: order limits and extending to 30m
Cultural Heritage	Cultural heritage receptors: 5km from the Order Limits
Ground Conditions	Cumulative development within 2km of the Order Limits.
Water Resource	Hydrological and hydrogeological receptors within a 2km radius from the Order Limits based on the hydrological and

	hydrogeological connectivity of water bodies located in the vicinity of the Scheme.
Socio Economic	Administrative areas of host local planning authorities which include Doncaster Council and North Lincolnshire Council.
Transport and Access	Extent of the local road network affected by the construction and decommissioning phases up to the M180, as well as any identified sensitive receptors within 5km of the Order Limits.
Noise and vibration	The study area for the construction phase assessment is defined by the noise and vibration sensitive receptors that have the potential to be affected by noise and vibration caused by construction activities. The study area for the operational assessment includes noise sensitive receptors (NSRs) in the local area located within 1km from the Order Limits.
Air quality	The air quality assessment considers the potential for impacts from construction and operational traffic on roads considered within the transport assessment. For construction dust, the assessment considers up to 250 m from the Order Limits and within 50m of the routes used by construction vehicles up to 250m from the site exits. GHG emissions from the scheme contributes to climate change globally, not just locally, and therefore it is not appropriate to define a zone of influence. Therefore, the cumulative assessment for this topic is related to the global scale.
Agricultural circumstances	Agricultural land and soils within the Order Limits
Other Environmental Topics	10km from the Order Limits.

17.3.5. The overall combined 'search area' for the long list of relevant other existing development and/or approved development(s) has been based on the largest ZoI in terms of distance, which in this case is 10km, which is the study area for

internationally designated sites for the biodiversity assessment and has been applied for the Other Environmental Topics assessment. Following the adoption of the 10km ZoI, a desk study exercise was undertaken to identify other known proposed developments within the 10km ZoI, using Landstack, Planning Inspectorate's Planning Portal, planning registers for each administrative area and other relevant sources. This generated a long list of sites and this is presented at **ES Appendix 17.1 Cumulative Long List Document Reference 6.3.17.1 Revision 2]**. Additionally, one site beyond the 10km ZoI has been included in the Short List (No.19) at a 12.8km distance from the Order Limits. This site was included based on a former wider Order Limits, of which this Site was closer in distance to the former Order Limits, and remains in the assessment for completeness.

17.3.6. The long list of other existing and/or approved development has been established using the tiered approach in accordance with Planning Inspectorate's Advice Note on Cumulative Effects Assessment **[Ref 17-1]**. The note recommends that a wide range of future projects is included within the Cumulative Effects Assessment (CEA) which can be tiered (from Tier 1-3) according to how far advanced the development is within the planning system and to the level of detail that is likely to be available for each tier. These different tiers are set out below, adapted to the context of the Scheme:

- Tier 1:
    - Projects under construction;
    - Permitted application(s) whether under the Planning Act 2008 or other regimes but not yet implemented; and
    - Submitted application(s) whether under the Planning Act 2008 or other regimes but not yet determined.
    - All refusals subject to appeal procedures not yet determined.
- Tier 2:
    - Project on the Planning Inspectorate programme of Projects where an EIA Scoping Report has been submitted.
- Tier 3:
    - Projects on the Planning Inspectorate Programme of Projects where an EIA Scoping Report has not been submitted;

- Identified in the relevant Development Plan (and emerging Development Plans – with appropriate weight being given as they move closer to adoption) recognising that there will be limited information available on the relevant proposals; and
- Identified in other plans and programmes (as appropriate) which set the framework for future development consents or approvals, where such development is reasonably likely to come forward.

17.3.7. A decreasing level of detail is likely to be available for Tier 2 and Tier 3 developments, as such, the CEA is less likely to be able to make a robust assessment in relation to these projects. Where relevant information for these is available, further investigation is undertaken. However, where detail is not available to carry out a robust assessment, these developments have not been assessed any further and justification given for this in **ES Appendix 17.1 Cumulative Long List [Document Reference 6.3.17.1 Revision 2]**.

17.3.8. Only the following types of other existing developments and/or approved developments have been considered for inclusion on the long list, as the Applicant considers that any development that does not fall within these types would not likely give rise to a significant cumulative effect:

- NSIP developments;
- Energy developments;
- Infrastructure developments;
- Industrial developments;
- Minerals and waste developments;
- Residential developments with 10 or more units; and
- Commercial and Employment developments.

17.3.9. Of the development types listed above, the developments included in the long-list are based on the following criteria which has been informed through professional judgement:-

- Development on the Planning Inspectorate National Infrastructure Planning Programme of Projects where, as a minimum, an EIA Scoping Opinion has been requested;

- Planning applications yet to be determined or have been determined within the last 3 years;
- Planning applications that have been refused but subject to appeal procedures within the last 3 years;
- Development identified in other plans and programmes which set the framework for future development consents/approvals where such development is reasonably likely to come forward;
- For residential development the threshold was 10 or more units; and
- For all qualifying development types, site area threshold was set at 1 acre or more.

17.3.10. Criteria are developed and applied to filter developments which may be excluded from the initial long list, having regard to the size and spatial influence of each development. Projects that are under construction and expected to be completed before the submission of the DCO would be considered as part of the baseline. Projects that are under construction but not expected to be completed prior to the commencement of the Scheme will remain on the long list.

17.3.11. The long list of 'other development' was collated prior to finalisation of the ES, as required, and was up-to-date and frozen on the 14 May 2025.

17.3.12. Where 'other developments' are completed before the construction of the Scheme, any effects from them should be considered as part of the baseline and are considered as part of the EIA.

Stage 2 - Establishing a Short List of other existing and, or approved development

17.3.13. There is no formal guidance on the size of a 'Study Area' when considering the cumulative impact of a development. Factors such as topography of a landscape can affect the extent of a visual envelope for cumulative or sequential views; flight lines for birds moving from a roosting to a feeding ground could affect the cumulative impact on ecology. As a result, consideration will be given to the known environmental constraints on and around the Scheme to determine what factors could affect extent of cumulative sites.

17.3.14. To ensure that the cumulative assessment is proportionate, threshold criteria will be applied to the long list to establish a shortlist. The criteria will ensure that

only other existing and/or approved development, which is likely to result in significant cumulative effects, is taken forward to the assessment stage. The threshold criteria that will be used will consider the following factors:

- Temporal scope:
    - consideration of relative construction, operation and decommissioning programmes of the 'other development' identified in the ZoI with the Scheme programme, to establish whether there is overlap, or similar temporal scope for construction, operation and decommissioning phases, and any potential for interaction.
- Scale and nature of the development:
    - consideration of whether the scale and nature of the developments identified in the ZoI are likely to interact with the Scheme and to result in a cumulative effect;
    - characteristics of other developments in relation to use of natural resources, pollution and nuisances, and risks to human health;
    - the scale of developments which are more than 1 hectare of urban development which is not a dwelling development;
- the development includes more than 50 dwellings; and
- the overall area of the development exceeds 5 hectares.
- Other factors
    - nature and/or capacity of the receiving environment that would make a significant cumulative effect with 'other development'. The sensitivity of the receiving environment includes whether the sites are within:
        - wetlands, riparian areas, river mouths;
        - coastal zones and the marine environment;
        - mountain and forest areas;
        - nature reserves and parks;

- European sites and other areas classified or protected under national legislation;
- areas in which there has already been a failure to meet the environmental quality standards, laid down in Union legislation and relevant to the project, or in which it is considered that there is such a failure;
- densely populated areas; and
- landscapes and sites of historical, cultural or archaeological significance.

- the relative abundance, availability, quality and regenerative capacity of natural resources in the area;
- potential for creation of source-pathway-receptor impacts; and
- the likely significance of effects where environmental assessments have been undertaken for the 'other developments' as having moderate to large significance.

- Professional judgement.

17.3.15. The cumulative assessment within the ES will consider the schemes set out within **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]** and summarised in **Table 17-6** below. The numbering for the short list has restarted from 1 and is therefore different to that of the long list.

Consideration of the NGET 400kV substation and 400kV export connection cable connection

17.3.16. The Applicant notes that for the purposes of complying with the EIA Regulations, "only effects which evidence shows are likely to occur and which are capable of meaningful assessment must be assessed" and, in this context, the EIA Regulations do not "impose obligations which are impossibly onerous and unworkable" (R (on the application of Finch on behalf of the Weald Action Group) v Surrey County Council [2024] UKSC 20).

17.3.17. The Applicant has a Bilateral Connection Agreement from National Electricity System Operator Limited (NESO) for the connection of the Scheme to the transmission network. The Applicant originally received a grid connection offer from National Electricity System Operator Limited (NESO) on 13 December 2021,

offering connection to a new National Grid Electricity Transmission (NGET) 400kV Substation with an export capacity of 340MW. That offer was accepted by the Applicant on 27 July 2022. Two subsequent grid connection offers to vary the agreement were received by the Applicant on 27 January 2022 for an additional 250MW and 26 September 2024 for an additional 210MW and were accepted by the Applicant on 26 April 2023 and 25 November 2024, respectively.

17.3.18. The agreement identifies that a new 400kV substation, which is to be consented and delivered separately by NGET, would be required to increase capacity on the network to connect the Scheme to the transmission network, and other potential projects which could be brought forward on the same network (the NGET 400kV substation).

17.3.19. The Applicant understands that NGET has commenced its siting process for the NGET 400kV substation, but the exact location of the NGET 400kV substation will not be confirmed until this process is concluded. The final location of the NGET 400kV substation will be dependent on many factors such as technical, design and environmental considerations, as well as other factors outside the control of the Applicant. This includes the requirements of NGET, the owners of the national distribution network infrastructure, and their further appraisal and connection considerations.

17.3.20. Following the conclusion of the siting work, NGET would then progress a separate consenting process for the NGET 400kV substation and would own and operate the NGET 400kV substation following construction.

17.3.21. A 400kV export connection cable will be required to connect the Scheme to the new NGET 400kV substation ("the 400kV export connection cable"). As the location of the new NGET 400kV substation is not yet known, it is not possible at this stage for the Applicant to identify and assess the potential route options for the 400kV export connection cable would take from the RWE on-site 400kV substation to the NGET 400kV substation. The 400kV export connection cable beyond the Order Limits would be progressed via a separate consenting process in the future.

17.3.22. Whilst the Applicant continues to engage with NGET, there is therefore currently no meaningful information for the Applicant to assess that 400kV export connection cable connection, or the NGET 400kV substation in this Environmental Impact Assessment. This approach is consistent with the requirements of the EIA Regulations (see, for example, R (Khan v. London Borough of Sutton ([2014] EWHC 3663 (Admin), noting that there is a similar

"want of information" in relation to the NGET 400kV substation and the 400kV export connection cable connection as a result). Accordingly,, the potential new NGET 400kV substation has not been included as a potential cumulative scheme for assessment and is not listed within **ES Appendix 17.1 Cumulative Long List [Document Reference 6.3.17.1 Revision 2]** nor **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]** and the 400kV export connection cable is not capable of being included in this Environmental Impact Assessment**.**

17.3.23. Should, during the course of Examination of this DCO Application, further details become available for the potential new NGET 400kV substation and 400kV export connection cable that would make it capable of assessment under the EIA Regulations and Planning Inspectorate's Advice Note Seventeen **[Ref 17-1],** this assessment will be updated accordingly.

17.3.24. The Applicant has also proposed a Requirement within Schedule 2 of the **Draft DCO [REP5-002]** which will ensure that consent is in place for the 400kV export connection cable prior to commencement of the Scheme, providing certainty that the grid connection will be in place before the DCO is implemented. The Applicant has set out its approach to consenting the 400kV export connection cable connection in the **Grid Connection Statement [REP1-014]**. The Secretary of State will therefore be able to rely upon the existence of a stringently operated regime for future control of those aspects (see the general principle endorsed in Associated Petroleum Terminals (Immingham) Ltd v Harbour Master for the River Humber [2025] EWHC 1992).

17.3.25. The Applicant notes that pursuant to Schedule 4, paragraph 5(e)) of the EIA Regulation a description of the likely significant effects of the development on the environment resulting from the cumulation of effects with other existing and/or approved projects should be accounted for. The proposed new NGET 400kV substation and 400kV export connection cable is not an existing and/ or approved project. Furthermore, Planning Inspectorate's Advice Note Seventeen **[Ref 17-1]** recommends that a wide range of future projects is included within the Cumulative Effects Assessment (CEA) which can be tiered (from Tier 1-3) according to how far advanced the development is within the planning system and to the level of detail that is likely to be available for each tier. Applying this criteria, the potential new NGET 400kV substation and 400kV export connection cable do not engage any of the Tier 1, 2 or 3 criteria.

List of shortlisted schemes for cumulative assessment

Table 17-6 Details of Shortlisted Cumulative Schemes

Cumulative Impacts

ID	Brief Description of Scheme	Reference Number	Distance from Site	PINS Tier	ES Environmental Aspect Chapter Relevant to Consider
1	EIA screening request for circa 1,200 dwellings	PA/SCR/2024/10	8.4km to the east	3	Biodiversity
2	Application for 128 dwellings Pending decision	PA/2024/780	8.5km to the east	1	Biodiversity
3	Application for 593 dwellings, 200sqm commercial unit (Use Class E) and lake, along with associated infrastructure Pending decision	PA/2023/1124	7.7km to the east	1	Biodiversity Landscape and Visual
4	Application for remediation of land, extraction of sand and gravel, restoration and 74 dwellings. Withdrawn	24/03257/STPLFE	9km to the north west	1	Biodiversity
5	B2, B8 and Class E:(g) Employment uses of 31,846 square metres for up to 52 units and parking granted on appeal	23/01971/REMM	10km to the south	1	Biodiversity
6	220 dwellings Pending decision	24/02105/FULM	1.15km to the west	1	Biodiversity Landscape

					and Visual Noise Water Resources Ground Conditions
7	158 dwellings Pending decision	PA/2023/1750	8.3km to the east	1	Biodiversity
8	81 dwellings Pending decision	PA/2023/1585	9.0km to the east	1	Biodiversity
9	178 dwellings Granted	24/00700/REMM	8.5km to the west	1	Biodiversity
10	241 dwellings Granted	21/03631/REMM	8.5km to the west	1	Biodiversity
11	542 dwellings Granted	23/01709/OUTM	8.5km to the west	1	Biodiversity
12	EIA Screening for mixed used scheme	PA/SCR/2023/2	4.53km to the south	3	Biodiversity
13	248 dwellings Granted	22/00255/REMM	7.1km to the west	1	Biodiversity
14	36,378 sq m (GIA) of industrial estate development (Use Classes B2, B8 and E(g)); up to 2,787sq m (GIA) of community, leisure and commercial uses (Use Classes E, F1 and F2) Granted	22/01934/OUTM	4.3 km to the west	1	Biodiversity
15	200 dwellings Granted	PA/2022/1628	9.9km to the east	1	Biodiversity

16	B2, B8 and Class E:(g) – Employment uses of 31,846 square metres for up to 52 units and parking Granted	22/00250/OUTM	10km to the south	1	Biodiversity
17	Employment units, internal estate roads, associated landscaping and infrastructure Granted	22/00590/REMM	1.4km to the west	1	Biodiversity Traffic and Transport Landscape and Visual Noise Water Resources Ground Conditions
18	Planning permission for the construction and operation of a ground-mounted solar farm, including associated equipment, infrastructure, cable route and ancillary works Pending Decision	PA/2025/445	4.3km to the north	1	Biodiversity Socio Economics Landscape and Visual Noise Water Electric and Electromagnetic Fields Waste
19	Hybrid application comprising full planning permission to erect five dwellings and outline planning permission for 94 dwellings	PA/2020/554 APP/Y2003/W/21/3278257	12.8km to the south east	1	Biodiversity

	Granted				
20	550 dwellings, a local centre (use Class E), construction of a new vehicular access off the M181/A1077(M) roundabout Pending decision	PA/2025/254	7.8km to the east	1	Biodiversity
21	229 dwellings Granted	25/00583/FULM	3.6km to the west	1	Biodiversity Cultural Heritage
22	350 dwellings including access from Hurst Lane Refused	25/00287/OUTM	9.9km to the south	1	Biodiversity
23	North Humber to High Marnham DCO Application Pre-application stage	EN020034	Adjacent the Order Limits	2	Biodiversity Socio Economics Cultural Heritage Landscape and Visual Noise Water Ground Conditions Population Air Quality Agricultural Circumstances Major Accidents and Disasters

					Waste Electric and Electromagn etic Fields
24	Fenwick Solar Project DCO Application Granted	EN010152	8km to the west	1	Biodiversity Socio Economics Electric and Electromagneti c Fields Waste
25	North Lincolnshire Green Energy Park DCO Application Granted	EN010116	8.5km to the east	1	Biodiversity Socio Economics Electric and Electromag netic Fields Waste
26	40 short term accommodation units - The Lincolnshire Golf Club, Crowle Road, Belton Granted	PA/2025/1535	50m east	1	Biodiversity Transport Cultural Heritage Landscape and Visual Noise Air Quality Agriculture Water Ground Conditions Major Accidents and Disasters Electric and Electromagn etic Fields

27	Humber Carbon Capture Pipeline - from Drax to Easington DCO Application Pre-application Stage	EN0710003	3.0km northeast	2	Biodiversity Socio Economics Landscape and Visual Noise
28	50MW ground-mounted solar farm Pending Decision	PA/2025/444	3.0km east	1	Biodiversity Transport Landscape and Visual Noise Waste Electric and Electromagnetic Fields
29	Sand and gravel extraction site Pending Decision	26/00559/MIN	6.2km to the southwest	1	Biodiversity
30	East Coast Hydrogen Humber Pipeline DCO Application Pre-Application Stage	EN0710008	6.3km north	2	Biodiversity Socio Economics
31	200 dwellings Pending Decision	26/00411/OUTM	8km southwest	1	Biodiversity

17.3.26. The cumulative schemes set out in **Table 17-6** are shown on **ES Figure 17.1 Cumulative Sites Plan [Document Reference 6.4.17.1 Revision 2]**.

17.3.27. The cumulative shortlist of 'other developments' was made available to all technical teams undertaking the EIA for consideration in the individual assessment of cumulative effects, presented within this chapter. The above table provided detail as to which development have been assessed within each environmental discipline.

17.3.28. Where schemes have been discounted from the shortlist, they will continue to be monitored to ensure that any changes to those schemes are identified and their omission from the shortlist is reassessed.

Stage 3: Information gathering of the 'other developments'

17.3.29. A desk study search of the environmental information available for each of the 'other developments' has been undertaken. This included searching on the Local Planning Authorities and the Planning Inspectorate's websites and through ongoing engagement with the local planning authorities. The information gathered has been used to identify the likely significant cumulative effects for assessment at Stage 4.

Stage 4: Assessment of Likely Significant Effects

17.3.30. The assessment of likely significant cumulative effects is undertaken to an appropriate level of detail commensurate with the information available for the 'other developments' within each ES Environmental Aspect Chapter. Measures will be set out envisaged to avoid, prevent, reduce or if possible, offset any identified significant adverse cumulative effects and, where appropriate, any proposed monitoring arrangements. The assessment presented within this chapter includes a list of those developments considered to have the potential to generate a cumulative effect together with each ES Environmental Aspect considered within the ES. The general criteria used to determine significance of effects is set out in **Table 17-7** below. Effects which are 'Moderate', or 'Major' are generally deemed to be significant in EIA terms, however each Environmental Aspect will apply professional judgement and use the methodology presented within each chapter for defining significance.

Table 17-7 Significance of Effect Criteria Table for Cumulative Effects

Significance of Effect	Typical descriptors of effects
Major	• Where the cumulative effects of the Scheme in association with other development upon an

(Adverse or Beneficial)	individual or collection of environmental receptors would be notably significant (positive or negative). This could be by virtue of their effect at a regional or district scale and/or potential concerns to the project, depending upon the relative importance attached to the issue during the decision-making process. They are generally, but not exclusively associated with sites and features of national importance and resources/features which are unique and which, if lost, cannot be replaced or relocated. • Effects would be permanent for receptors of very high value. • Effects at this level are material in the decision-making process.
Moderate (Adverse or Beneficial)	• Where the cumulative effects of the Scheme in association with other development upon an individual or collection of environmental receptors could be significant (positive or negative). These effects are likely to be important locally. • Effects at this level can be considered to be material decision-making factors.
Minor (Adverse or Beneficial)	• Where the cumulative effects of the Scheme in association with other development upon an individual or collection of environmental receptors would be noteworthy but not significant (positive or negative). These effects are likely to be raised as issues locally but not particularly notable

	• Effects at this level are unlikely to be of a nature that would be material in the decision-making process.
Negligible	• Where the cumulative effects of the Scheme in association with other development upon an individual or collection of environmental receptors would be negligible and not significant (positive or negative). Typically, these effects are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

17.3.31. Where information is available a quantitative assessment has been provided. However where this information is not available qualitative assessments have been undertaken to assess cumulative effects by technical chapter authors. It is acknowledged that quantitative assessments would rely on varying methodologies and underlying assumptions used for the other development and as stated previously relies on a level of information being available. Therefore, where this information is not available a qualitative cumulative assessment that uses professional judgement is considered appropriate.

In Combination Effects Assessment Approach

17.3.32. The interaction of two or more predicted environmental effects resulting from the Scheme may collectively cause a greater, or lesser, effect than each effect in isolation. Examples of types of interactive effects may include, for example effects of water discharges on ecology or effects of landscaping on ecology. Whilst some ES Environmental Aspect Chapters intrinsically assess in-combination effects as part of their assessment approach by virtue of their methodologies, there is still the potential for other in-combination effects to arise which are not captured through topic assessments and as such need to be considered.

17.3.33. In relation to the assessment of in-combination effects, NSIP- Advice Note Nine: Rochdale Envelope **[Ref 17-2]** states that the assessment should "*ensure that the assessment of the worst case scenario(s) addresses impacts which may not be significant on their own but could become significant when they inter-relate with other impacts alone or cumulatively with impacts from other development (including those identified in other aspect assessments)" (paragraph 4.13).*

17.3.34. NSIP: Advice on Cumulative Effects Assessment Note **[Ref 17-1]** has formed the basis of assessing cumulative effects between the Scheme and other developments. The advice however does not provide any guidance on assessing effect interactions resulting from different types of effects generated by the Scheme having an in-combination effect on the same receptor(s).

17.3.35. Guidance prepared by Hyder Consulting for the European Commission **[Ref 17-3]** defines 'effect interactions', differentiating them from cumulative effects between the Scheme and other developments, and provides some high-level guidance on how the results of the assessment should be presented. The assessment methodology presented below is based on this high-level guidance with professional judgement applied to inform the details of the methodology. The approach to assessing effect interactions of ES Environmental Aspect Chapters that do not show clear intrinsically linked in-combination effects as part of their methodologies follows a three-stage process, as outlined in the following paragraphs.

Stage 1 – Topic Specific Assessment of Likely Significant In-combination Effects

17.3.36. The Assessment of Likely Significant Effects is presented in each of the ES Environmental Aspect Chapters and comprises the individual assessments of residual effects on receptors across the construction, operation and decommissioning phases of the Scheme. The mitigation by design, additional mitigation and enhancements proposed in technical chapters is assumed to be implemented before consideration of the in-combination cumulative effects. Therefore, residual effects identified in **ES Chapters 6 to 16** of this ES have been considered.

Stage 2 – Identification of Receptors

17.3.37. Stage 2 identifies 'receptor groups' found within the ES Environmental Aspect Chapters that require further assessment for in-combination effects. Not every individual receptor assessed within ES Environmental Aspect Chapters is assessed but rather potentially sensitive 'receptor groups' are identified through the EIA process. Only receptors that are expected to incur more than one potential effect have been included in the assessment.

17.3.38. Receptors predicted to be affected by only a single effect are excluded because there is considered to be no potential for in-combination effects to take place. It should be noted that uncertainty in the assessment of effects, for most of the

ES Environmental Aspect Chapters, is dealt with by making a realistic worst-case assumption.

Stage 3 – In-Combination Effects Assessment

17.3.39. An assessment is made of the potential for in-combination effects to arise for identified receptor groups for the construction, operation and decommissioning phase of the Scheme. This involves the assessment of the scope for all effects to interact, spatially and temporally, to create in-combination effects on a receptor group.

17.3.40. Where the in-combination effects of the Scheme would likely lead to a change in the significance of effects at a receptor group, when compared with considering these impacts in isolation, the in-combination effect would be determined as Significant.

17.3.41. Where the in-combination effects of the Scheme are likely to not lead to a change in the significance of effects at a receptor group, when compared with considering these impacts in isolation, the in-combination effect would be determined as Not Significant.

17.3.42. Those ES Environmental Aspect Chapters that intrinsically assess in-combination effects as part of their assessment approach by virtue of their methodologies is set out in **Table 17-8** below.

Table 17-8 In-combination effects intrinsically assessed as part of the standard assessment approach for each ES Environmental Aspect Chapter

Environmental factor and scope of combined effects assessed within ES Environmental Aspect Chapters
ES Chapter 6 Landscape and Visual [REP4-021] considers the in-combination effects of the landscape and ecological mitigation proposals, which have been developed jointly by the authors of the two chapters. Regard is also given to the in-combination effects on landscape features of the drainage proposals set out in **ES Chapter 10 Water Resource [REP2-021]** and regard is also given to the in-combination effects on landscape and heritage features set out in **ES Chapter 8 Cultural Heritage and Archaeology [REP4-025].**
ES Chapter 7 Ecology and Nature Conservation [REP5-012] considers the in-combination ecological effects on receptors such as area of land

required, disturbance due to noise, changes in air quality due to construction dust, changes in water quality, and loss of habitats.
ES Chapter 8 Cultural Heritage and Archaeology [REP4-025] considers the in-combination effects from different sources on archaeological and heritage assets such as visual and noise impacts affecting the setting of a heritage asset or hydrological impacts on below ground features.
ES Chapter 12 Traffic and Transport [REP4-015] considers the in-combination effects of changes in traffic and severance on people and community assets such as residential property, recreation infrastructure and existing businesses.
ES Chapter 13 Noise and Vibration [REP4-017] considers the in-combination effects of noise and vibration impacts on residential receptors, non-residential receptors (i.e., retail, employment, educational and health receptors) and ecological receptors.
ES Chapter 14 Air Quality and Greenhouse Gases [REP2-025] – considers in-combination effects from changes in traffic on human health and ecological receptors.

Legislation and Policy Context

Legislation

17.3.43. The requirement to consider cumulative and in-combination effects is set out in the EIA Regulations. Regulation 5(2)(e) requires the consideration of:

"*the interaction between the factors referred to in sub-paragraphs (a) to (d).*" These factors are: population and human health; biodiversity; land, soil, water, air, and climate; material assets, cultural heritage and landscape."

17.3.44. Paragraph 5(e) of Schedule 4 of the EIA Regulations describes cumulative effects as:

"the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources."

Policy

17.3.45. Under Section 104 of the Planning Act 2008 (the Act), the Secretary of State (SoS) is directed to determine a Development Consent Order (DCO) application with regard to the relevant National Policy Statement (NPS), the local impact

report, matters prescribed in relation to the Scheme, and any other matters regarded by the SoS as important and relevant. There are three NPSs which are considered to be 'relevant NPS' under Section 104 of the Act:

- Overarching NPS for energy (NPS EN-1) **[Ref 17-4]**
- NPS for renewable energy infrastructure (NPS EN-3) **[Ref 17-5]**
- NPS for electricity networks infrastructure (NPS EN-5) **[Ref 17-6]**

17.3.46. It is considered that other national and local planning policy will be regarded by the SoS as 'important and relevant' to the Scheme.

17.3.47. A detailed account of the planning policy framework relevant to the Scheme is provided in the **ES Chapter 5 Policy and Legislative Context [APP-042]**.

17.3.48. The National Planning Policy Framework (updated in February 2025) **[Ref 17-7]** paragraph 198 requires that cumulative effects are considered in planning policies and decision making:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development."

17.3.49. The Overarching NPS for energy (EN-1) **[Ref 17-4]** at paragraph 4.3.3 require cumulative impacts to be taken into account:

"The Regulations require an assessment of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, transboundary, short, medium, and long-term, permanent and temporary, positive and negative effects at all stages of the project, and also of the measures envisaged for avoiding or mitigating significant adverse effects."

Guidance

17.3.50. There is currently no standard methodology for a CEA, however, there is a range of public sector and industry led guidance available.

17.3.51. The Planning Inspectorate Advice Note Seventeen **[Ref 17-1**] provides advice regarding a staged approach for documenting the CEA within an ES, relevant to

Nationally Significant Infrastructure Projects (NSIPs). The Advice Note highlights the need to consider the potential for cumulative effects arising due to the interactions between different components of the development, as well as with other existing development and/or approved development.

17.3.52. The assessment presented in this chapter is consistent with Planning Inspectorate Advice Note 17. The methodology and approach set out in **section 17.3** of this ES chapter follows the guidance set out in this advice note and provides further details.

17.4. Cumulative Effects Assessment

Landscape and Visual

17.4.1. **Section 17.3** above sets out the overarching approach to the identification of relevant sites for consideration in the cumulative assessment. This includes discussion of the four-stage process to assessing cumulative effects beginning with the identification of a long list of 'other development' and its subsequent refinement down to a short list. This short list of other existing, approved or proposed cumulative sites is set out in **Table 17-6**, with the sites also illustrated on **ES Figure 17.1 Cumulative Sites Plan [Document Reference 6.4.17.1 Revision 2]**.

17.4.2. The ZoI for the consideration of landscape and visual effects has been determined to be a 3km radius from the Scheme. This is considered to represent the maximum distance from the Scheme where any of the other projects would have the potential to result in significant effects with the Scheme. It has been determined based on professional judgement, alongside an understanding of the nature and characteristics of the landscape surrounding the Scheme and with regard to the limited theoretical visibility of the Scheme within the wider landscape, as illustrated on **ES Figure 6.3 Screened Zone of Theoretical Visibility with Viewpoints and Photomontage Locations [REP4-041].**

17.4.3. The short list of other existing, approved or proposed cumulative sites set out in **Table 17-6** listed 25 sites. Of these, there are 6no. which lie within the 3km LVIA ZoI, as set out in **Table 17-9** below.

Table 17-9 Details of Shortlisted Cumulative Schemes considered in Landscape and Visual Cumulative Assessment

ID	Brief Description of Scheme	Reference Number	Distance from Site

6	220 dwellings at Land To The South Of Alexandra Street, Thorne, Doncaster **Pending decision**	24/02105/FULM	1.15km to the west
17	Employment units, internal estate roads, associated landscaping and infrastructure at Land On The North East Side Of Selby Road, Thorne, Doncaster **Granted**	22/00590/REMM	1.4km to the west
23	North Humber to High Marnham DCO Application - proposed 400kV electricity transmission connection between Birkhill Wood and High Marnham **Pre-application stage**	EN020034	Adjacent to the Order Limits
26	40 short term accommodation units - The Lincolnshire Golf Club, Crowle Road, Belton **Granted**	PA/2025/1535	50m to the east.
27	Humber Carbon Capture Pipeline - from Drax to Easington **DCO Application** **Pre-application Stage**	EN0710003	3km north east
28	50MW ground-mounted solar farm **Pending Decision**	PA/2025/444	3km north

17.4.4. The closest cumulative project to the Scheme is the proposed 400kV electricity transmission connection between Birkhill Wood and High Marnham, which is currently at pre-application stage and which lies adjacent to the Order Limits. It

is currently proposed to pass adjacent to section of Parcel E that is proposed for biodiversity mitigation only.

17.4.5. The closest visual receptors assessed in **ES Chapter 6 Landscape & Visual [REP4-022]** to the proposed line are Residential Properties Ref 57 to 60 and users of Public Right of Way 21 adjacent to the River Torne represented by Viewpoint 26. Property 57 would not be in close proximity to the proposed overhead lines. Property 58 is recorded as an involved property (Tenanted) and would not be in close proximity to the proposed overhead lines. Property 59 lies outside the SZTV of the Scheme and would not be in close proximity to the proposed overhead lines. Property 60 would not be in close proximity to the proposed overhead lines.

17.4.6. Public Right of Way 21 lies adjacent to the River Torne represented by Viewpoint 26. This section of the footpath is not in close proximity to the proposed overhead lines and views of the Scheme are to the west away from the proposed overhead lines. Where the footpath continues further to the east, towards the overhead lines visibility of the Scheme is not available behind intervening screening therefore there would not be any cumulative effects on this section of the route.

17.4.7. The proposed new 400kV electricity transmission connection would be located in a part of landscape which is already characterised in part by the presence of several existing 400kV electricity transmission lines, so any views towards the new route would in many cases already include existing 400kV electricity transmission lines. There are also numerous wind turbines which also provide existing vertical structures in the landscape.

17.4.8. However, it is noted that for visual receptors in close proximity to the new transmission connection, there may be potential for views of both the Scheme and the new transmission connection in relatively close proximity. The final proposals for the new transmission connection are not yet confirmed, but as a worst-case there would be the potential for there to be some localised **non-significant moderate cumulative effects** on views where both the transmission connection and the Scheme were visible in very close proximity. However, such locations would be likely to be highly localised and dependant on when the new transmission connection were to be constructed. The mitigation planting associated with the Scheme may serve to restrict the potential for these effects by virtue of the very limited visibility of the Scheme that would occur by Year 15.

17.4.9. Also located adjacent to the Order Limits is a proposal for 40 short term accommodation units at the Lincolnshire Golf Club, Crowle Road, Belton which lies 50m to the east of Land Parcel E. The proposed leisure and wellness facility is separated from the Order Limits by a strong band of trees (50m plus deep) within the wider ownership of the former golf course. The proposal shows these trees retained with a few very widely spaced holiday lodges located adjacent to the tree canopies and beyond the tree band within the former fairways. The remainder of the proposal is also located within the strongly wooded framework provided by the landscape of the former golf course.

17.4.10. Potential receptors of this scheme are very limited due to the very enclosed nature of the site and that the red line of the proposal is notably offset from the wider boundaries of the former golf course. As a result, there would be very limited potential for intervisibility between the proposed leisure and wellness development and the Scheme with any cumulative effects being no greater than **minor (not significant)**.

17.4.11. The next closest cumulative project to the Scheme is the proposed residential development at Land to the South of Alexandra Street, Thorne, which lies 1.15km to the west of the Order Limits. The proposed residential development is separated from the Order Limits by existing residential and commercial development in northern part of Thorne. As a result, there would be no potential for intervisibility between the proposed residential development and the Scheme with any cumulative effects being no greater than **minor (not significant)**.

17.4.12. The consented employment development at Land on the North East Side of Selby Road, Thorne, lies 1.4km to the west of the Oder Limits. This project lies on the opposite side of Thorne and Moorends to the Order Limits, beyond the M18 motorway and the Thorne to Goole railway line. It also lies adjacent to existing large scale commercial development which would serve to restrict the potential for any intervisibility between the project and the Scheme with any cumulative effects being no greater than **minor (not significant)**.

17.4.13. The Humber Carbon Capture Pipeline from Drax to Easing (ID 27) is located 3km to the north east at the closest point and is currently at pre application stage. It is understood that the pipeline itself would be underground but would also require a number of above ground installations along with a pump facility, therefore potential for cumulative effects would largely lie at the construction stage of the pipeline, if consented.

17.4.14. The closest visual receptors assessed in **ES Chapter 6 Landscape & Visual [REP4-022]** to the proposed Pipeline are Residential Properties 64 and 65 and users of Moor Road/Peatlands Way represented by Viewpoint 21. Property 64 Middle Moor Farm (currently a caravan) would not be in close proximity to the pipeline nor would Property 65 Rose Cottage and Welling House (currently a caravan), nor Moor Road. Whilst the proposed pipeline lies within the SZTV of the Scheme there would be very little potential for intervisibility and this would notably diminish beyond the construction stage of the pipeline. The final proposals for the Humber Carbon Capture Pipeline are not yet confirmed, but as a worst-case there could be some very limited and short term intervisibility between the proposed Humber Carbon Capture Pipeline development and the Scheme with any cumulative effects being no greater than **minor (not significant)**.

17.4.15. The final closest cumulative project to the Scheme is the 50MW ground mounted solar farm located at Land off Ealand Road Ealand (ID 28) 3km to the east at the closest point. The proposed 50MW solar farm is located immediately to the north of the Stainforth and Keadby Canal. Proposed hedgerow planting is shown adjacent to the southern boundary of the proposed 50MW solar farm which would partially screen views from the canal corridor. Whilst there is some potential for receptors moving within the canal corridor to experience some sequential cumulative effects, the proposed 50MW solar farm is located outside the SZTV of the Scheme and therefore there would be no intervisibility between the project and the Scheme. Any cumulative effects would be no greater than **moderate (not significant)**. The mitigation planting associated with the Scheme and the proposed 50MW solar farm may serve to further restrict the potential for these effects by virtue of the limited visibility of the Scheme that would occur by Year 15.

Ecology and Nature Conservation

17.4.16. No cumulative impacts are considered likely as a consequence of the proposals.

17.4.17. The short-listed projects detailed in **Table 17-6**, have been reviewed to consider if there are any cumulative effects relating to ecology. Further detail is also provided in **Appendix 17.4 - Ecology Cumulative Assessment Table [Document Reference: 6.3.17.4 Revision 2]**.

17.4.18. Six additional cumulative schemes have been considered as part of the updated assessment: the Lincolnshire Golf Club development (PA/2025/1535), Humber Carbon Capture Pipeline (EN0710003), Land off Ealand Road Solar Farm (PA/2025/444), Seven Yards Farm mineral development (26/00559/MIN), East

Coast Hydrogen Humber Pipeline (EN0710008) and Land South of Ladycroft Road (26/00411/OUTM). No additional significant cumulative ecological effects have been identified as a result of these cumulative schemes. Further details are provided in **Appendix 17.4 - Ecology Cumulative Assessment Table [Document Reference: 6.3.17.4 Revision 2]**.

17.4.19. This assessment has been made in consideration of the timing and scale of the projects included in the cumulative assessment, the mitigation proposed for those projects and considering the mitigation and assessment results pertaining to the Scheme including:

- Onsite mitigation for loss of habitats used by passage and non-breeding birds: golden plover, lapwing, pink-footed geese and greylag geese, including the provision of large areas of neutral grassland and also arable provision, with both habitats managed specifically for these bird species that are associated with the Humber Special Protection Area (SPA) and have been recorded utilising the Order Limits.

- Adoption of measures to avoid / mitigate habitat loss, run-off, pollution, air quality, noise and disturbance during the construction phase outlined within the **Outline Ecological Construction Management Plan (eCMP) [REP5-031]** and decommissioning detailed in the **Decommissioning Environmental Management Plan (DEMP) [REP5-026]**. These measures will prevent impacts to retained habitats and the designated sites in the area, including Thorne and Hatfield Moors SPA, Thorne Moors Special Area of Conservation (SAC), Hatfield Moors SAC, Humber Estuary SPA / Ramsar and SAC.

- Adoption of the **Outline Landscape Ecological Management Plan (LEMP) [Document Reference 7.6 Revision 6]** for the lifetime of the Scheme to ensure the quality of habitat provided on site for passage / non-breeding birds associated with Humber Estuary SPA / Ramsar and nightjar, which are associated with Thorne and Hatfield Moors SPA, is maintained. The measures will additionally provide the required habitat areas of skylark and provide biodiversity gains.

17.4.20. In addition to the above, the Scheme will result in the cessation of intensive agricultural management in the area, such as the regular application of agrichemical input, soil exposure and disturbance through cropping and ploughing. Therefore, water quality both within the Order Limits and wider area will improve and disturbance levels will decrease. This will benefit the designated sites in the area, specifically those that are hydrologically linked, as well as

retained habitats and the species that use these habitats, including breeding and non-breeding birds, water vole, otter, and aquatic invertebrates.

17.4.21. Given the nature of the Scheme, solar, there will be no impacts as a consequence of the Scheme from recreation or increases in population size to any European designated sites.

17.4.22. The proposals for the Scheme will result in significant gains in biodiversity as demonstrated by the BNG assessment, resulting in ecological enhancements within the Order Limits that will benefit a variety of wildlife, including birds, bats, invertebrates, water voles, otter and herpetofauna.

17.4.23. The gains in biodiversity achieved through new habitat creation as detailed in the landscape proposals provided as part of the **ES Figure Landscape and Visual Mitigation Strategy [REP4-042]**, will also ensure connectivity through the Order Limits and to the wider area is enhanced for wildlife compared to the existing situation, with the Order Limits currently dominated by intensively managed arable farming.

17.4.24. With the implementation and maintenance of the measures detailed above, there will be no negative residual impacts due to the proposals for the Scheme, with the residual impacts of the Scheme are considered to be minor beneficial for the statutory designated site qualifying bird species that utilise the Order Limits, including lapwing, golden plover, pink-footed geese and nightjar. This is as a consequence of the enhanced habitat provision that will be secured for the duration of the Scheme. There will also be beneficial impacts to a range of habitats and species including greylag geese, skylark, water vole, bats, invertebrates and herpetofauna, due to the cessation of intensive agricultural farming practices and the habitat creation and management proposed.

17.4.25. On this basis, and having regard to the potential Likely Significant Effects associated with other projects identified in **Table 17-16**, as well as the Conservation Objectives and qualifying features of the relevant designated sites, the Applicant's conclusion is that that the Scheme will not result in Likely Significant Effects, either alone or in-combination with other projects. Consequently, the integrity of the designated sites will not be adversely affected.

17.4.26. Furthermore, any proposed planning application must demonstrate ecological enhancements, gains in biodiversity and no impacts to any designated sites occur in order to comply with relevant policy and legislation. Therefore, as long as the measures proposed in any proposed planning application are

implemented appropriately and prevents any impacts alone, there can be no-in combination impacts.

17.4.27. As such, with the implementation of the proposed ecological mitigation and enhancement measures it is possible to conclude that there will be no impacts either alone or in-combination with any other plan or project and therefore no cumulative impacts as a consequence of the Scheme.

Cultural Heritage and Archaeology

17.4.28. The short-listed projects detailed in **Table 17-6**, above, have been reviewed to consider if any cumulative effects relating to cultural heritage would arise. No cumulative effects on cultural heritage assets have been identified arising from any of the short-listed schemes. The reasoning behind the assessment identifying no cumulative or in-combination effects can be outlined as follows. The four designated heritage assets identified as being adversely affected by the Scheme are neither intervisible nor historically associated with any of the land within the extents of the short-listed schemes. The same is also true in relation to the three non-designated built-heritage assets.

17.4.29. The 57 non-designated archaeological assets identified within the Order Limits are spatially separated from the land within the extents of the short-listed projects and there will therefore be no cumulative or in-combination effects arising.

17.4.30. Additionally, the proximity of short-listed scheme ID 26 (40 short term accommodation units - The Lincolnshire Golf Club, Crowle Road, Belton - PA/2025/1535) meant this was very carefully considered as part of this assessment. However, the Scheme has been assessed as resulting in no adverse effects to the Listed Hirst Priory or the surrounding golf course and would be subject to negligible adverse effects from the construction of the short-listed scheme, therefore no significant cumulative effects would result.

Ground Conditions

17.4.31. Of the 4 sites that have been identified within 2km of the Order Limits with relevance for cumulative effects assessment, **no significant** cumulative effects have been identified for ground conditions, the assessment is presented in **Table 17-10** below. Additionally, ID 26 (40 short term accommodation units - The Lincolnshire Golf Club, Crowle Road, Belton - PA/2025/1535) is within 2km of the Order Limits, however, as the development is of temporary nature and low risk operation, comprising portable buildings, is it not anticipated any

cumulative effects are likely from a ground conditions perspective and this site is not taken forward to cumulative effects assessment.

Table 17-10 Ground Conditions Cumulative Effects Assessment

ID	Identified Common Receptor (s)	Cumulative Effect Assessment Text	Significance of effect
6, 17, 18, 23	Human health	The Order Limits is of a predominantly greenfield nature, with the exception of the wartime RAF airbase which was shown on historic mapping to extend into the southeast of Land Parcel E and localised areas of peat extraction and associated tramways. However given the age of these potential sources any contamination present is likely to have significantly degraded over time. Given the Order Limits relatively low contaminative potential, coupled with the distance to identified cumulative sites / receptors it is deemed highly unlikely any cumulative impacts will occur.	Negligible (not significant)
6, 17, 18, 23	Surface water recourses	The Order Limits is crossed by numerous watercourses and a system of drainage ditches. Named watercourses located on site include the Old River Don, Hatfield Waste Drain. Stainforth & Keadby Canal (Sheffield and South Yorkshire Navigation) – with North and South Soak Drains running parallel on either side and the River Thorne, run adjacent to the Order Limits. Numerous surface water abstractions are also recorded on site for agricultural/irrigation purposes.	Negligible (not significant)

		There is potential for cumulative impacts of surface water quality during the development phase in the event of accidental fuel / oil spillage entering water courses and combining with any releases from other approved developments. Similarly, if bad practises are adopted for construction surface water management there is potential for sediment rich / silt contamination ingress into water courses that could create cumulative impacts with other development sites. The potential risks from these impacts are reduced, given the distance to cumulative development sites it is unlikely cumulative effects will occur as a result.	
6, 17, 18, 23	Bedrock / Controlled waters resources	The western and central site area (Land Parcel C, Land Parcel D and central and southern portion of Land Parcel A, and the western extent of Land Parcel E) falls within Zone 3 (Total Catchment) of the groundwater Source Protection Zone (SPZ). The designation is associated with an abstraction borehole at Sandtoft Road Pumping Station, located approximately 830m to the west of Land Parcel D. One licensed groundwater abstraction is recorded on-site, situated at Grove Farm in the western portion of Land Parcel C, previously used for general farming and domestic purposes. However, this abstraction is classified as historical and is no longer active. Given the nature of the Scheme there will be limited groundworks for foundations and owing to the predominantly greenfield nature of the Order Limits and the distance to cumulative development sites it is	Negligible (not significant)

		unlikely cumulative effects will occur as a result.	
6, 17, 18, 23	Mineral Resource of Underlying Geology	As discussed above access to local areas restricted only during lifetime of the development which is temporary and there will be no significant depletion or damage to resource, thus the Scheme will not contribute to cumulative effects for loss of mineral resource	Negligible (not significant)

Water Resources

17.4.32. The cumulative short list of developments considered in the cumulative assessment are included in **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]**. Five of the shortlisted developments are located within the 2km Zone of Influence for Water Resources. Based on the 2km Zone of Influence, it is therefore these 5 developments that have been considered within this cumulative assessment. The five developments considered include Land to the South of Alexandra Street, Thorne (ID number 6) and Land on the North East Side of Selby Road, Thorne (ID number 17), Land North of Chapel Lane, Keadby (ID number 18),North Humber to High Marnham DCO Application (ID number 23) and The Lincolnshire Golf Club, Doncaster (ID number 26).

17.4.33. All identified developments within the Water Resources Zone of Influence will be required to appropriately manage water resources, flood risk and drainage to ensure they do not have a negative impact on the sites themselves or adversely affect water resources or increase flood risk elsewhere. The developments will also be subject to the same relevant policy and regulatory requirements as the Scheme (or equivalents for the development type and relevant at the time of submission), including the need to demonstrate suitable drainage strategies, flood risk mitigation and compliance with relevant national and local policy requirements. Given the regulatory compliance in place, together with the requirement for each development to demonstrate that flood risk and drainage impacts can be appropriately mitigated as part of the consenting process, it is considered that sufficient mitigation measures will be incorporated into the identified developments to ensure no significant adverse impacts on water resources, flood risk and drainage. Regardless of proximity, likely construction

dates or other factors, all developments will be required to manage water resources, flood risk and drainage appropriately and in accordance with policy. On this basis, the cumulative effect is considered to be **negligible (not significant)**.

17.4.34. **Table 17-25** provides a summary of potential impacts on the water environment, as assessed in **ES Chapter 10 Water Resources [REP2-021]** and the associated cumulative assessment of the five developments identified within the 2km Zone of Influence.

17.4.35. All five identified cumulative developments have been grouped together within **Table 17-25** on the basis that their impacts on each receptor are considered to be the same, with each development being required to appropriately manage impact on each receptor.

Table 17-25- Summary of Cumulative Effects Assessment for Water Resources

Cumulative Development ID	Identified Common Receptors	Cumulative Effect Assessment	Significance of Cumulative Effects
6, 17, 18, 23, 26	Watercourses	<u>Mud & Debris</u> There is potential for the Scheme and cumulative developments to cause mud and debris arising during construction to enter surface water/land drainage systems, causing blockages and restricting flow. Any mud and debris blockages would likely be localised, temporary in nature, and manageable through routine maintenance and inspection of surface water/land drainage system. In addition, the Scheme and cumulative developments will be required to manage any	Negligible (Not Significant)

		debris arising to ensure watercourses are not adversely impacted. This would generally be managed through standard good practice measures and a temporary construction drainage network used to manage construction phase runoff into the surface water system/land drainage system. Such measures would typically include regular inspection and maintenance of drainage infrastructure and the controlled management of runoff during construction activities. <u>Pollution</u> There is potential for leaks and spillages within the Scheme and for the cumulative assessment sites to pollute surface watercourses via overland flow. This would generally be managed through implementation of standard pollution prevention and good practice construction measures, including appropriate storage and handling of chemicals and fuels, together with a temporary construction drainage network used to manage construction phase runoff into the surface water system/land drainage system. As such, any effects would be	

		expected to be temporary, localised and appropriately controlled.	
6, 17, 18, 23, 26	Surface Water	<u>Silt Contamination</u> Soil erosion and movement of sediment from shallow road excavations and temporary construction access tracks could contaminate surface water with silt. This is generally managed with a temporary construction drainage network used to manage construction phase runoff into the surface water system/land drainage system. The drainage system for the Scheme will be developed to prevent silt-laden runoff from entering surface water drains, watercourses and ponds without treatment. The cumulative assessment sites would also be required to implement appropriate construction phase drainage, treatment and pollution prevention measures in accordance with relevant regulatory requirements. Temporary drainage measures would be used, where necessary, to prevent uncontrollable discharge of runoff to surrounding watercourses and land drainage systems.	Negligible (Not Significant)

6, 17, 18, 23, 26	Groundwater	<u>Silt Contamination</u> Soil erosion and movement of sediment from shallow road excavations and temporary construction access tracks could contaminate groundwater with silt. This is generally managed with a temporary construction drainage network used to manage construction phase runoff into the surface water system/land drainage system. The drainage system for the Scheme will be developed to prevent silt-laden runoff from entering surface water drains, watercourses and ponds without treatment. The cumulative assessment sites would also be required to implement appropriate construction phase drainage, treatment and pollution prevention measures in accordance with relevant regulatory requirements. Temporary drainage measures would be used, where necessary, to prevent uncontrolled discharge and infiltration of runoff. As such, any effects would be expected to be temporary, localised and appropriately controlled. <u>Pollution</u> There is potential for leaks and spillages within the Scheme	Negligible (Not Significant)

		and for the cumulative assessment sites to pollute groundwater bodies through infiltration. The Scheme and any cumulative developments are required to implement a surface water drainage strategy which not only manages runoff rates and associated flood risk, but also mitigates the risk of pollution. It is also required to detail how the proposed surface water drainage features will be managed to ensure continual operation over the lifetime of the development. In practice, this would typically include standard pollution prevention and good practice construction measures, including appropriate storage and handling of fuels and chemicals, regular inspection and maintenance of drainage infrastructure, and controlled management of runoff during construction and operation. As such, any effects on groundwater quality would be expected to be temporary, localised and appropriately controlled.	
6, 17, 18, 23, 26	Areas of predicted flood risk.	<u>Impermeable Area</u> Areas of increased impermeable area within the Scheme and for the cumulative development sites, left unmanaged during	Negligible (Not Significant)

		construction and operation, could increase overland flow and localised flooding. The Scheme and any cumulative developments are required to implement a surface water drainage strategy to ensure surface water runoff rates and associated flood risk does not occur as a result of the development. It is also required to detail how the proposed surface water drainage features will be managed to ensure continual operation over the lifetime of the development. Such measures would typically include attenuation, controlled discharge rates and ongoing maintenance of drainage infrastructure to ensure that runoff rates and flood risk are appropriately managed throughout the lifetime of the development. <u>Culverts</u> Culverts installed for either the construction or operation phase have the potential to impact existing flow patterns of watercourses within the Order Limits and as a result, may cause increased flood risk. Any culverts proposed within the Scheme or cumulative assessment sites are required to ensure flow patterns and associated flood	

		risk do not increase as a result of the development. This would typically be demonstrated through appropriate hydraulic assessment and drainage design as part of the planning and consenting process, together with ongoing maintenance of culvert infrastructure where required.	

Socio Economics

17.4.36. The approach to the assessment of cumulative effects in relation to socio-economics aligns with that which is set out in **ES Chapter 11 Socio Economics [APP-048]** for the Scheme in isolation. Similarly, the baseline presented in **ES Chapter 11 Socio Economics [APP-048]** underpins the socio-economics cumulative assessment, being used to identify the sensitivity of receptors (North Lincolnshire, Doncaster and East Riding of Yorkshire districts).

17.4.37. Of the cumulative sites outlined, seven have been considered in the assessment of cumulative effects in respect of socio-economics (see **Table 17-12**). The information presented includes a summary of the known proposals and whether the cumulative scheme is scoped in or out of the socio-economic cumulative assessment with justification. Any cumulative schemes that are non-energy sector are scoped out of the socio-economic cumulative assessment. It is understood that construction skills required for an energy scheme are different to those of other types of schemes. While construction supports 6.7% of employment in Doncaster, 6.5% in North Lincolnshire and 5.0% in East Riding of Yorkshire, compared to 4.9% regionally and 4.8% nationally **[Ref 17-11]**, it is expected that much of the skills required for an energy sector scheme are specialist construction skills and cannot be assumed to align with the existing construction workforce. Therefore, while all schemes will be expected to generate employment in the construction stage, there is not expected to be complete overlap in respect of the same construction skill set.

17.4.38. Where possible, definitive information regarding potential effects is presented in **Table 17-13**, obtained through a review of publicly available documentation

held for public viewing on the National Infrastructure Planning website or local authority planning portals, whichever is applicable to each cumulative scheme.

17.4.39. Where quantified information is not available, assumptions are made. Assumptions are dependent on the potential effect in consideration with the aim of presenting a worst-case assessment of each potential effect. Further detail is provided in the following paragraphs and a summary of the assumptions to enable a worst-case scenario is presented in **Table 17-11**.

Employment, Economic Contribution and Business Rates

17.4.40. Information relating to employment has been obtained through a review of publicly available documentation accessed via the National Infrastructure Planning website or local authority planning portals, whichever is applicable to each cumulative scheme. Where this information is not publicly available, an assumption is made in that no employment, economic contribution or business rates are generated so as to result in a worst-case cumulative assessment.

Accommodation Demand

17.4.41. In respect of the potential for accommodation demand, where possible, definitive numbers of workers requiring accommodation in each development phase are taken from publicly available information, either via the National Infrastructure Planning website or local authority planning portals, whichever is applicable to each cumulative scheme. Otherwise, the same assumptions are applied to the cumulative schemes as for the Scheme in isolation.

Accommodation Demand Effect on Visitors

17.4.42. For the effect of accommodation demand from construction workers on visitors, where information is already in the public domain regarding the workers requiring accommodation, this is used for the relevant cumulative scheme. Where it is not already publicly available, the worst-case assumption aligns with that which is applied in the case of the Scheme in isolation, i.e., it is based on the peak number of workers. It is assumed that all these workers would require accommodation, as opposed to applying additionality factors (e.g. displacement / leakage). Finally, it is assumed that the construction phases of the cumulative schemes align with that of the Scheme.

17.4.43. For the effect of accommodation demand from decommissioning workers on visitors, where information is already in the public domain regarding the workers requiring accommodation, this is used for the relevant cumulative scheme.

Where it is not already publicly available, the worst-case assumption aligns with that which is applied in the case of the Scheme in isolation, i.e., it is based on requiring 50% of the peak number of construction workers. It is assumed that during decommissioning all of these workers would require accommodation, as opposed to applying additionality factors (e.g., displacement / leakage). Finally, it is assumed that the decommissioning phases of the cumulative schemes align with that of the Scheme.

Accommodation demand effect on local tourism sector

17.4.44. For the effect of accommodation demand from construction workers on the local tourism sector, where information is already in the public domain regarding the workers requiring accommodation, this is used for the relevant cumulative scheme. Where it is not already publicly available, the worst-case assumption aligns with that which is applied in the case of the Scheme in isolation, i.e. it is based on the proportion of the peak number of workers who could be sourced from outside the local area (be that Doncaster, North Lincolnshire or East Riding of Yorkshire) and on site at any one time. Aligned with the Additionality Guide [**Ref 17-12**], it is assumed that there would be a '*medium*' level of leakage (25% leakage), whereby '*a reasonably high proportion of jobs would be retained*'. As such, it is assumed that there would be the need to accommodate 25% of the peak number of construction workers. Finally, it is assumed that the construction phases of the cumulative schemes align with that of the Scheme.

17.4.45. For the effect of accommodation demand from decommissioning workers on the local tourism sector, where information is already in the public domain regarding the workers requiring accommodation, this is used for the relevant cumulative scheme. Where it is not already publicly available, the worst-case assumption aligns with that which is applied in the case of the Scheme in isolation, i.e. it is based on the proportion of 50% of the peak number of workers who could be sourced from outside the local area (be that Doncaster, North Lincolnshire or East Riding of Yorkshire) and on site at any one time. Aligned with the Additionality Guide [**Ref 17-12**], it is assumed that there would be a '*medium*' level of leakage (25% leakage), whereby '*a reasonably high proportion of jobs would be retained*'. As such, it is assumed that there would be the need to accommodate 25% of the 50% peak number of construction workers. Finally, it is assumed that the decommissioning phases of the cumulative schemes align with that of the Scheme.

17.4.46. In terms of assessment of significance, the approach remains as stated within **ES Chapter 11 Socio Economics [APP-048]** (see section 11.2 Assessment Approach).

Table 17-11 Cumulative assessment - scope of potential effects and worst-case assumptions in respect of socio-economics

Potential Effect	Worst case assumption
Construction Phase	
Employment	Unless information is publicly available regarding construction jobs generated by the cumulative scheme, it is assumed that 0 jobs are generated at the local scale to contribute to a worst-case scenario in respect of employment.
Economic contribution	Unless information is publicly available regarding GVA generated by the construction phase of the cumulative scheme, it is assumed that £0 GVA is generated to contribute to a worst-case scenario in respect of economic contribution.
Accommodation demand – Visitors	Based on the peak number of workers or other worst-case assumption available based on publicly available information. Where no information published relating to employment, assumption of 0.7 jobs per MW is applied, based on ongoing benchmarking library, to account for potential jobs that could be generated. It is assumed that all workers would require accommodation, as opposed to applying additionality factors (e.g. displacement / leakage).
Accommodation demand – Local Tourism Sector	Unless otherwise presented in publicly available information, based on 50% of the peak number of construction workers. Where no information published relating to employment, assumption of 0.7 jobs per MW is applied, based on ongoing benchmarking library, to account for potential jobs that could be generated. It is assumed that during decommissioning all of these workers would require accommodation, as opposed to applying additionality factors (e.g., displacement / leakage.

Potential Effect	Worst case assumption
Operational Phase	
Employment	Unless information is publicly available regarding operational jobs generated by the cumulative scheme, it is assumed that 0 jobs are generated at the local scale to contribute to a worst-case scenario in respect of employment.
Business rates	Business rates are assumed to equal £0 where information is not available in order to assess a worst-case scenario.
Decommissioning Phase	
Employment	Unless information is publicly available regarding decommissioning jobs generated by the cumulative scheme, it is assumed that 0 jobs are generated at the local scale to contribute to a worst-case scenario in respect of employment.
Economic contribution	Unless information is publicly available regarding GVA generated by the decommissioning phase of the cumulative scheme, it is assumed that £0 GVA is generated to contribute to a worst-case scenario in respect of economic contribution.
Accommodation demand - Visitors	Unless other worst-case assumption available based on publicly available information, worst-case is based on the proportion of the peak number of workers who could be sourced from outside the local area (be that Doncaster, North Lincolnshire or East Riding of Yorkshire) and on site at any one time. Assume a '*medium*' level of leakage (25% leakage), whereby '*a reasonably high proportion of jobs would be retained*' (Additionality Guide [**Ref. 17-12**]). Overall, assume the need to

Potential Effect	Worst case assumption
	accommodate 25% of the peak number of construction workers.
Accommodation demand – Local Tourism Sector	Unless other worst-case assumption available based on publicly available information, worst-case is based on the proportion of 50% of the peak number of workers who could be sourced from outside the local area (be that Doncaster, North Lincolnshire or East Riding of Yorkshire) and on site at any one time. Assume a '*medium*' level of leakage (25% leakage), whereby '*a reasonably high proportion of jobs would be retained*' (Additionality Guide [**Ref 17-12**]). Overall, assume the need to accommodate 25% of the 50% peak number of construction workers.

Table 17-12 Scope of Cumulative Assessment, Socio-Economics

Cumulative Scheme	Application Reference	Description	Scoped in?	Reason
1	PA/SCR/2024/10	EIA screening request for circa 1,200 dwellings, a local centre and school, green infrastructure, drainage infrastructure, open space and associated highway infrastructure	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
2	PA/2024/780	Application for approval of reserved matters (appearance, landscaping, layout and scale reserved) pursuant to outline planning permission PA/2020/1333 dated 29/06/2021 for 128 dwellings	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
3	PA/2023/1124	Planning permission for the development of 593 dwellings, 200sqm commercial unit (Use Class E) and lake, along with associated infrastructure, including landscaping, public	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning

		open space and play area, pedestrian and cycle links, pumping station and sub-station		requirements differ to the Proposed Development.
4	24/03257/STPLFE	Hybrid Application consisting of a) Full Planning Permission for the removal and remediation of contaminated material, extraction of sand and gravel and the reinstatement of the void with imported restoration materials and b) Outline Permission for residential development (of up to 74 dwellings) with associated public open space and habitat enhancement	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
5	23/01971/REMM	Details of appearance, landscaping, layout and scale for B2, B8 and Class E:(g) Employment uses of 31,846 square metres for up to 52 units and parking. (from appeal 22/00040/NONDET allowed 17/04/2023.)	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
6	24/02105/FULM	Erection of 220 dwellings with associated infrastructure.	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning

				requirements differ to the Proposed Development.
7	PA/2023/1750	Planning application to erect 158 dwellings with associated car parking, garages, landscaping, open space, pedestrian circulation and links, pumping station, infrastructure works and access from Burringham Road	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
8	PA/2023/1585	Planning permission for 81 dwellings	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
9	24/00700/REMM	Details of appearance, landscaping, layout and scale for the erection of 178 dwellings (Phase 2 development) (being matters reserved in outline application previously granted	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning

		permission under ref: 23/01709/OUTM on 08.02.2024).		requirements differ to the Proposed Development.
10	21/03631/REMM	Details of appearance, landscaping, layout and scale for the erection of 241 dwellings (Phase 1 development) (being matters reserved in outline application previously granted permission under ref: 18/02592/3OUTM on 29.05.2019 (as subsequently varied under ref: 23/01709/OUTM).	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
11	23/01709/OUTM	Outline application for residential development of up to 542 dwellings on approx. 20.9ha of land with associated public open space, parking, landscaping and infrastructure (approval being sought for access) without compliance with condition 18 of planning application reference 23/00138/OUTM granted on 26/04/2023.	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
12	PA/SCR/2023/2	EIA screening request for a mixed use scheme to include residential, retail, commercial, charity, health, leisure, open space and	No	This is not an energy scheme, therefore the impacts do not overlap and the

		landscaping - AMENDED DOCUMENT - Initial Feasibility		construction/decommissioning requirements differ to the Proposed Development.
13	22/00255/REMM	Details of Access, Appearance, Landscaping, Layout and Scale of design for 248 units with 25 affordable units and 223 open market units (being matters reserved in outline application previously granted permission under ref 15/01278/OUTM on 05/02/2019). (Amended Plans and Description)	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
14	22/01934/OUTM	Outline application (all matters reserved) for the erection of up to 36,378 sq m (GIA) of industrial estate development (Use Classes B2, B8 and E(g)); up to 2,787sq m (GIA) of community, leisure and commercial uses (Use Classes E, F1 and F2) and associated works	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
15	PA/2022/1628	Application for approval of reserved matters (appearance, landscaping, layout and scale) pursuant to outline planning permission	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning

		PA/2019/1782 dated 03/04/2020 for a residential development of up to 200 dwellings		requirements differ to the Proposed Development.
16	22/00250/OUTM	Outline Planning Permission (including means of access only) for B2, B8 and Class E:(g) - Employment uses of 31,846 square metres for up to 52 units and parking	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
17	22/00590/REMM	Details of appearance, landscaping, layout and scale for the construction of employment units, internal estate roads, associated landscaping and infrastructure (being reserved matters for outline application 16/02136/OUTA, granted on 20.01.2022)	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
18	PA/SCR/2021/8	EIA screening request relating to a proposed 49.9MW solar farm.	Yes	Energy scheme with similar employment skill requirements
19	PA/2020/554 APP/Y2003/	Hybrid application comprising full planning permission to erect five dwellings and outline planning permission for 94 dwellings with	No	This is not an energy scheme, therefore the impacts do not overlap and the

	W/21/3278257	appearance, landscaping, layout and scale reserved for subsequent consideration		construction/decommissioning requirements differ to the Proposed Development.
20	PA/2025/254	Hybrid planning permission comprising of outline, with all matters reserved for up to 550 dwellings, a local centre (use Class E), associated landscaping, drainage and other infrastructure works.	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
21	25/00583/FULM	Erection of 229 residential dwellings with parking, landscaping, open space and infrastructure and two access points from Waggons Way, Stainforth	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
22	25/00287/OUTM	Hybrid planning application comprising: Outline application for residential development of up to 350 houses with associated access, landscaping and public open space; Outline application for residential development of up to	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning

		350 houses with associated access, landscaping and public open space; and Full application for the creation of access from Hurst Lane and enabling earthworks to create a development platform and Full application for the creation of access from Hurst Lane and enabling earthworks to create a development platform		requirements differ to the Proposed Development.
23	EN020034	North Humber to High Marnham - National Grid proposed 400kV electricity transmission connection between Birkhill Wood and High Marnham.	Yes	Energy scheme with similar employment skill requirements
24	EN010152	Fenwick Solar Project - installation of solar photovoltaic (PV) generating panels, associated electrical equipment, cabling and energy storage facilities together with grid connection infrastructure. The generating capacity of the Scheme will exceed 50 MW and its maximum capacity is anticipated to be 237.5MW.	Yes	Energy scheme with similar employment skill requirements

25	EN010116	North Lincolnshire Green Energy Park - The Project consists of an Energy Recovery Facility (ERF) converting up to 650,000 tonnes per annum of Refuse Derived Fuel (RDF) to generate a maximum of 95 Mega Watts of electrical output (MWe) and/or 380 Mega Watts of thermal output (MWt) to provide power, heat and steam on the site of the operating Flixborough Wharf on the River Trent.	Yes	Energy scheme with similar employment skill requirements
26	PA/2025/1535	Planning permission for the change of use of part of the former golf course to accommodate a mixed-use development comprising up to 40 short term accommodation units and bunk barn, refurbishment of the existing clubhouse building for use as a café, shop and offices, outdoor leisure facilities including padel courts, a swimming lake, a community hub health and wellness facility, and restoration of the walled gardens with associated landscaping and access works (Use Classes C1, E, F2).	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.

27	EN0710003	Humber Carbon Capture Pipeline - Linear route extending from Drax (North Yorkshire) to Easington (East Riding of Yorkshire)	Yes	Energy scheme with similar employment skill requirements
28	PA/2025/444	Planning application for the construction and operation of a ground-mounted solar farm, including associated equipment, infrastructure, cable route and ancillary work	Yes	Energy scheme with similar employment skill requirements
29	26/00559/MIN	Proposed phased extraction of sand and gravel with progressive restoration through the importation of inert material to agriculture, together with associated processing plant, stockpiling, soil storage bunds, internal haul roads, weighbridge, wheel wash, settlement lagoons, and use of existing access and agricultural yard for vehicle turning at land	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.
30	EN0710008	East Coast Hydrogen Humber Pipeline - The Project consists of the construction (including repurposing) and operation of an approximately 110km underground high and intermediate pressure hydrogen pipeline	Yes	Energy scheme with similar employment skill requirements

		between Saltend and Byram. It will include spurs off the main pipeline to connect with off-takers and will also include associated infrastructure (e.g. Above Ground Infrastructure such as Pressure Reduction Installations, Block Valve Stations and district governors) along the route of the pipeline.		
31	26/00411/OUTM	Outline application for residential development of up to 200 houses with associated infrastructure (all matters reserved except for access)	No	This is not an energy scheme, therefore the impacts do not overlap and the construction/decommissioning requirements differ to the Proposed Development.

Table 17-13 Figures and Estimates Associated with Cumulative Schemes

Cumulative Scheme No.	Construction Effects			Operational Effects		Decommissioning Effects		
	Jobs	GVA	Accommodation Demand	Jobs	Business Rates	Jobs	GVA	Accommodation Demand
18	0*	0*	35*	0	0*	0*	0*	17*
23	418	£16,900,000	569	0*	0*	0	0	0
24	200	£12,600,000	250	1	0*	200	0*	250
25**	420	£20,014,286	507	290	0*	420	0	507
27	0*	0*	500***	0*	0*	0	0	0
28	0*	0*	35*	0*	0*	0*	0*	17*
30	0*	0*	500	0*	0*	0	0	0

Cumulative Scheme No.	Construction Effects			Operational Effects		Decommissioning Effects		
	Jobs	GVA	Accommodation Demand	Jobs	Business Rates	Jobs	GVA	Accommodation Demand
Total	**1,038**	**£49,514,286**	**2,396**	**291**	**0**	**620**	**0**	**791**
Total + Proposed Development	**1,264**	**£86,008,561**	**2,879**	**291**	**£891,072**	**735**	**£18,247,138**	**1,033**

*No information so assumed to be 0 or other applicable assumption applied.

For this Scheme, figures sourced from the planning application are totals for the entire 7-year build phase. Therefore, the numbers in the table are those totals divided by 7 to provide an annual figure to use in this assessment.* For this scheme, there is no information available regarding the number of on site workers. This means that there is no information regarding accommodation demand, and due to the nature of the scheme it is not possible to use the assumption of a certain number of jobs per MW. Therefore, a figure of 500 is used as this scheme is similar in nature to scheme 30, which is estimated to require a peak of 500 workers.

Table 17-14 Assumptions used for basis of Cumulative Assessment – inclusive of Scheme and Cumulative Schemes

Potential effect	Scheme in isolation	Cumulative Schemes	Total (inclusive of Scheme plus Cumulative Schemes)
Construction			
Employment	231	1,038	1,269
Economic Contribution	£36,494,276	£49,514.286	£86,008,561
Accommodation demand – Visitors	483	2,396	2,879
Accommodation demand – Local Tourism Sector	121	2,396	2,517
Operation			
Employment	0	291	291
Business Rates	£891,072	£0	£891,072

Decommissioning			
Employment	115	620	735
Economic Contribution	£18,247,138	£0	£18,247,138
Accommodation demand – Visitors	242	791	1,033
Accommodation demand – Local Tourism Sector	61	791	852

Significance of the Cumulative Construction Phase Effects

Employment

17.4.47. The known 1,038 on-site construction phase jobs generated by the cumulative schemes identified in **Table 17-13** combined with the number of on-site construction phase jobs generated by the Scheme is 1,269.

17.4.48. The significance of construction phase effect in respect of employment is assessed as follows:

- The sensitivity of the receptor (employment in construction and other sectors of the economy in Doncaster, North Lincolnshire, and East Riding of Yorkshire) is assessed as being medium. Construction employment represents around 6.7% of employment in Doncaster, 6.5% in North Lincolnshire, and 5% in East Riding of Yorkshire. However, this is set in the context that employment growth between 2015 and 2023 in all three authorities was below national levels.

- The magnitude of the impact is assessed as high. The 1,269 jobs per annum supported by the construction phase of the cumulative schemes represent a considerable increase in the number of new employment opportunities, for a temporary period of time.

- The significance of the temporary cumulative effect in respect of employment during the construction phase is therefore considered to be **major beneficial** in Doncaster, North Lincolnshire, and East Riding of Yorkshire, which is **significant**.

Contribution to Economic Output

17.4.49. There are three cumulative schemes for which a figure is publicly available relating to the economic contribution of their respective construction phases (cumulative scheme 23, 24 and 25). The GVA contribution of these three schemes totals £49.5million per annum, whilst the other scheme is assumed to generate no benefit to enable a worst-case scenario. Combining the cumulative figure with the contribution of the Scheme results in a total uplift in annual GVA of around £86million.

17.4.50. The significance of construction phase cumulative effect in respect of economic contribution is assessed as follows:

- The sensitivity of the receptor (economic contribution in construction and other sectors of the economy in Doncaster, North Lincolnshire, and East Riding of Yorkshire) is assessed as being medium. In Doncaster, construction supported around 9.4% of GVA, in North Lincolnshire this figure was 7.3%, and in East Riding of Yorkshire 5.7% of GVA was supported by the construction sector. The total combined value of construction across the three authorities is around £1.7billion per annum.

- The magnitude of the impact is assessed as high. The £86million per annum in GVA generated by the construction phase would cause an uplift of 5.1% in the total construction GVA of the three authorities, although it should be noted that a proportion of the GVA will be in other sectors when taking into account the multiplier effect.

- The significance of the temporary cumulative effect in respect of economic contribution during the construction phase is therefore considered to be **major beneficial** in Doncaster, North Lincolnshire, and East Riding of Yorkshire, which is **significant**.

Accommodation demand

17.4.51. For the cumulative assessment, construction programmes of all Cumulative Schemes plus the Scheme are assumed to align. It is unrealistic to assume that all workers across the Cumulative Schemes would be accommodated within a single local authority, it is more realistic to expect workers to be accommodated across a range of local authorities. As such, the effect on accommodation demand during construction is assessed against the capacity of accommodation in all three Local Authorities combined (Doncaster, North Lincolnshire, and East Riding of Yorkshire).

Accommodation demand effect on visitors

17.4.52. The worst-case scenario in terms of accommodation of construction workers on visitors to the local area is based on the peak number of workers, where known. It is assumed that all of these workers would require accommodation, as opposed to applying additionality factors. As set out in **Table 17-13** and **Table 17-14**, based on available information and assumptions associated with the Cumulative Schemes, the total estimated number of construction workers needing accommodation alongside those of the Scheme itself is 2,879 .

17.4.53. **Table 17-15** sets out the impact on combined bedspace capacity across the three districts of accommodating the 2,879 construction workers. Across all twelve months there would be spare capacity following the housing of construction workers. Occupancy levels would peak in July when 82% of bedspaces would be occupied, leaving 6,216 bedspaces available. Occupancy would be lowest in January with 44% of bedspaces occupied and 18,884 available. Therefore, if workers were accommodated within all three districts there would be sufficient capacity throughout the year.

17.4.54. As demonstrated in the text above and table below, there would be spare capacity of bedspaces throughout the year following the accommodation of workers, both for each District in isolation and for all three Districts combined. This means that there would still be capacity for additional tourist visits throughout the year.

17.4.55. The significance of the construction phase accommodation demand effect on visitors is as follows:

- The sensitivity of the receptor in Doncaster, North Lincolnshire and East Riding is assessed as being low. Occupancy rates are low in some months throughout the year and there is spare capacity across all districts

throughout the year, ensuring additional guests are able to stay in local accommodation.

- The magnitude of the impact is assessed as medium. The construction workers would represent a moderate increase in the number of guests who would stay in local accommodation.
- The significance of the temporary effect is therefore considered to be **minor to moderate adverse,** which is **not significant.**

Table 17-15 Assumed Occupancy of Accommodation including construction workers across all three districts – Effects on Visitors

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total serviced and non-serviced bedspaces	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611
Actual number of bedspaces occupied	11,848	13,685	17,236	21,470	22,988	24,516	24,193	21,976	19,430	16,211	13,349	11,848
Total available bedspaces	21,763	19,926	16,375	12,141	10,623	9,095	9,418	11,635	14,181	17,400	20,262	21,763
Workers requiring accommodation	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879	2,879

Bedspaces occupied during construction	14,727	16,564	20,115	23,334	24,349	25,867	27,395	27,072	24,855	22,309	19,090	16,228
Occupancy rate inclusive of workers	44%	49%	60%	69%	72%	77%	82%	81%	74%	66%	57%	48%
Available bedspaces following housing of workers	18,884	17,047	13,496	10,277	9,262	7,744	6,216	6,539	8,756	11,302	14,521	17,383

Accommodation demand effect on local tourism sector

17.4.56. The worst-case scenario in terms of accommodation of construction workers on visitors to the local area is based on publicly available information, where known, or otherwise 50% of peak number of construction workers. It is assumed that all of these workers would require accommodation, as opposed to applying additionality factors. As set out in **Table 17-12** and **Table 17-13**, based on available information and assumptions associated with the Cumulative Schemes, the total estimated number of construction workers needing accommodation alongside those of the Scheme itself is 2,517 .

17.4.57. **Table 17-15** sets out the impact on combined bedspace capacity across the three districts of accommodating the 2,517 construction workers. Across all twelve months there would be spare capacity following the housing of construction workers. Occupancy levels would peak in July when 80% of bedspaces would be occupied, leaving 6,578 bedspaces available. Occupancy would be lowest in January with 43% of bedspaces occupied and 19,246 available. Therefore, if workers were accommodated within all three districts there would be sufficient capacity throughout the year.

17.4.58. As demonstrated in the text above and table below, there would be spare capacity of bedspaces throughout the year following the accommodation of workers for all three Districts combined. This means that the tourism industry would benefit from some uplift in occupancy as a result of workers being sourced from outside the local area and accommodated in serviced and non-serviced accommodation. These bedspaces would otherwise be empty and the economic benefits, such as local spend, generated by the construction phase of the Scheme would help to realise the key aims set out in relevant local policy such as the Yorkshire and Humber Business Plan [**Ref 17-13**] and the Visitor Economy Strategy for the City of Doncaster [**Ref 17-14**].

17.4.59. The significance of the construction phase accommodation demand effect on the local tourism sector is as follows:

- The sensitivity of the receptor in Doncaster, North Lincolnshire and East Riding is assessed as being **low**. Occupancy rates are low in some months throughout the year and there is spare capacity across all districts throughout the year, ensuring additional guests are able to stay in local accommodation.

- The magnitude of the impact is assessed as **low**. The construction workers would represent a small increase in the number of guests who would stay in local accommodation.

  The significance of the temporary effect is therefore considered to be **minor to moderate beneficial,** which is **not significant.**

Table 17-16 Assumed Occupancy of Accommodation including construction workers across all three districts – Effect on Local Tourism Sector

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total number of bedspaces	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611
Actual number of bedspaces occupied	11,848	13,685	17,236	21,470	22,988	24,516	24,193	21,976	19,430	16,211	13,349	11,848
Total available bedspaces	21,763	19,926	16,375	13,156	12,141	10,623	9,095	9,418	11,635	14,181	17,400	20,262
Estimated no. construction workers	2,517	2,517	2,517	2,517	2,517	2,517	2,517	2,517	2,517	2,517	2,517	2,517

Construction workers + occupied bedspaces	14,365	16,202	19,753	22,972	23,987	25,505	27,033	26,710	24,493	21,947	18,728	15,866
Room occupancy incl. construction workers	43%	48%	59%	68%	71%	76%	80%	79%	73%	65%	56%	47%
Actual remaining bedspaces	19,246	17,409	13,858	10,639	9,624	8,106	6,578	6,901	9,118	11,664	14,883	17,745

Significance of the Cumulative Operational Phase Effects

Employment

17.4.60. As shown in **Table 17-13** and **Table 17-14**, of those cumulative schemes for which data relating to employment is publicly available, it is estimated that they will generate around 291 jobs per annum during their operational phases. No jobs are expected to be generated as a result of the operational phase for the Scheme itself so the cumulative total stands at 291.

17.4.61. The significance of the operational phase effect in respect of employment has been assessed as follows:

- The sensitivity of the receptor (labour market of Doncaster, North Lincolnshire, and East Riding of Yorkshire) is considered to be medium. Between 2015 and 2023 Doncaster saw 6.4% growth in jobs, North Lincolnshire saw jobs growth of 4.1% and East Riding of Yorkshire saw growth of 6.9%, all of which were below national growth.

- The magnitude of the impact is identified as being medium. The number of on-site jobs created in the operational phase would represent a moderate increase in current employment levels, with the employment supported by the operational phase being long-term.

- The significance of the cumulative operational effect in respect of employment is therefore considered to be **moderate beneficial** in Doncaster, North Lincolnshire, and East Riding, which is **significant**.

Business Rates

17.4.62. As set out in **Table 17-13**, there is no information regarding business rates for any cumulative schemes. Therefore, it is assumed that for all schemes business rates will be £0 to ensure a worst-case scenario. Based on this assumption, the total figure including the Scheme would equate to £0.9million per annum.

17.4.63. The significance of the operational phase effect in respect of business rates has been assessed as follows:

- The sensitivity of the receptor in Doncaster and North Lincolnshire is considered to be medium. Between 2015 and 2023 all three authorities saw jobs growth below the national figure and have seen claimant count rise between October 2022 and October 2024.

- The magnitude of the impact is identified as being high. Given agricultural land and buildings are exempt from business rates, the business rates revenue generated from the scheme would represent a considerable uplift on current activities.

- The significance of the cumulative operational effect in respect of business rates is therefore considered to be **major beneficial** in Doncaster, North Lincolnshire, and East Riding of Yorkshire which is **significant**.

Significance of the Cumulative Decommissioning Phase Effects

Employment

17.4.64. Across the cumulative schemes, information relating to decommissioning jobs is only available for two of the schemes and equates to 620 jobs. Based on this information, the estimated total decommissioning jobs generated by the Scheme and cumulative schemes is 735 jobs.

17.4.65. The significance of the cumulative decommissioning phase effect in respect of employment is assessed as follows:

- The sensitivity of the receptor (employment in construction and other sectors of the economy in Doncaster, North Lincolnshire, and East Riding of Yorkshire) is assessed as being medium. Construction employment represents around 6.7% of employment in Doncaster, 6.5% in North Lincolnshire, and 5% in East Riding of Yorkshire. However, this is set in the context that employment growth between 2015 and 2023 in all three authorities was below national levels.

- The magnitude of the impact is assessed as medium. The 735 jobs per annum supported by the decommissioning phase represents a sizeable increase in the number of new employment opportunities for local residents, but is considered medium in magnitude due to the temporary nature of the change. Nevertheless, overall, there would be a boost to the availability of jobs for workers in these authorities.

- The significance of the temporary effect is therefore considered to be **moderate beneficial** in Doncaster, North Lincolnshire, and East Riding of Yorkshire, which is **significant**.

Contribution to Economic Output

17.4.66. Data on economic output for decommissioning is not available for any of the cumulative schemes, meaning that the decommissioning phase GVA will equate to that of the Scheme in isolation for a worst-case assumption. Therefore, the decommissioning phase GVA will total £18.2million per annum.

17.4.67. The significance of the cumulative decommissioning phase effect in respect of economic contribution is assessed as follows:

- The sensitivity of the receptor (economic contribution in construction and other sectors of the economy in Doncaster, North Lincolnshire, and East Riding of Yorkshire) is assessed as being medium. In Doncaster, construction supported around 9.4% of GVA, in North Lincolnshire this figure was 7.3%, and in East Riding of Yorkshire 5.7% of GVA was supported by the construction sector. The total combined value of construction across the three authorities is around £1.7billion per annum.

- The magnitude of the impact is assessed as medium. The £18.2million in annual GVA generated by the decommissioning phase would cause an uplift of 1.1% in the total construction GVA of the three authorities, although it should be noted that a proportion of the GVA will be in other sectors when taking into account the multiplier effect.

- The significance of the temporary effect is therefore considered to be **moderate beneficial** in Doncaster and North Lincolnshire, which is **significant**.

Accommodation Demand

17.4.68. For the cumulative assessment, decommissioning programmes of all Cumulative Schemes plus the Scheme are assumed to align. It is unrealistic to assume that all workers across the cumulative schemes would be accommodated within a single local authority, it is more realistic to expect workers to be accommodated across a range of local authorities. As such, the impact of accommodation demand during decommissioning is assessed against the capacity of accommodation in all three Local Authorities combined (Doncaster, North Lincolnshire, and East Riding of Yorkshire).

Accommodation demand effect on visitors

17.4.69. As set out in **Table 17-13** and **Table 17-14**, based on available information and assumptions associated with the Cumulative Schemes, the total estimated

number of decommissioning workers needing accommodation alongside those of the Scheme itself when considering the potential effect on visitors is 1,033 .

17.4.70. **Table 17-17** sets out the impact on combined bedspace capacity across the three districts of accommodating the 1,033 decommissioning workers. Across all twelve months there would be spare capacity following the housing of construction workers. Occupancy levels would peak in July when 82% of bedspaces would be occupied, leaving 6,216 bedspaces available. Occupancy would be lowest in January with 44% of bedspaces occupied and 18,884 available. Therefore, if workers were accommodated within all three districts there would be sufficient capacity throughout the year.

17.4.71. As demonstrated in the text above and table below, there would be spare capacity of bedspaces throughout the year following the accommodation of workers, both for each District in isolation and for all three Districts combined. This means that there would still be capacity for additional tourist visits throughout the year.

17.4.72. The significance of the decommissioning phase accommodation demand effect on visitors is as follows:

- The sensitivity of the receptor in Doncaster, North Lincolnshire and East Riding is assessed as being low. Occupancy rates are low in some months throughout the year and there is spare capacity across all districts throughout the year, ensuring additional guests are able to stay in local accommodation.

- The magnitude of the impact is assessed as medium.. The decommissioning workers would represent a moderate increase in the number of guests who would stay in local accommodation.

- The significance of the temporary effect is therefore considered to be **minor to moderate adverse,** which is **not significant.**

Table 17-17 Assumed Occupancy of Accommodation including decommissioning workers across all three districts – Effect on Visitors

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total serviced and non-serviced bedspaces	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611
Actual number of bedspaces occupied	11,848	13,685	17,236	21,470	22,988	24,516	24,193	21,976	19,430	16,211	13,349	11,848
Total available bedspaces	21,763	19,926	16,375	13,156	12,141	10,623	9,095	9,418	11,635	14,181	17,400	20,262
Workers requiring	1,033	1,033	1,033	1,033	1,033	1,033	1,033	1,033	1,033	1,033	1,033	1,033

accommodation												
Bedspaces occupied during construction	12,881	14,718	18,269	21,488	22,503	24,021	25,549	25,226	23,009	20,463	17,244	14,382
Occupancy rate inclusive of workers	38%	44%	54%	64%	67%	71%	76%	75%	68%	61%	51%	43%
Available bedspaces following housing of workers	20,730	18,893	15,342	12,123	11,108	9,590	8,062	8,385	10,602	13,148	16,367	19,229

Accommodation demand effect on local tourism sector

17.4.73. As set out in **Table 17-12** and **Table 17-13**, based on available information and assumptions associated with the Cumulative Schemes, the total estimated number of decommissioning workers needing accommodation alongside those of the Scheme itself when considering the potential effect on the local tourism sector is 852.

17.4.74. **Table 17-18** sets out the impact on combined bedspace capacity across the three districts of accommodating the 852 decommissioning workers. Across all twelve months there would be spare capacity following the housing of decommissioning workers. Occupancy levels would peak in July when 75% of bedspaces would be occupied, leaving 8,243 bedspaces available. Occupancy would be lowest in January with 38% of bedspaces occupied and 20,911 available. Therefore, if workers were accommodated within all three districts there would be sufficient capacity throughout the year.

17.4.75. As demonstrated in the text above and table below, there would be spare capacity of bedspaces throughout the year following the accommodation of workers for all three Districts combined. This means that the tourism industry would benefit from some uplift in occupancy as a result of workers being sourced from outside the local area and accommodated in serviced and non-serviced accommodation. These bedspaces would otherwise be empty and the economic benefits, such as local spend, generated by the construction phase of the Scheme would help to realise the key aims set out in relevant local policy such as the Yorkshire and Humber Business Plan [**Ref 17-13**] and the Visitor Economy Strategy for the City of Doncaster [**Ref 17-14**].

17.4.76. The significance of the construction phase accommodation demand effect on the local tourism sector is as follows:

- The sensitivity of the receptor in Doncaster, North Lincolnshire and East Riding is assessed as being low. Occupancy rates are low in some months throughout the year and there is spare capacity across all districts throughout the year, ensuring additional guests are able to stay in local accommodation.

- The magnitude of the impact is assessed as low.. The decommissioning workers would represent a small increase in the number of guests who would stay in local accommodation.

- The significance of the temporary effect is therefore considered to be **minor to moderate beneficial,** which is **not significant.**

Table 17-18 Assumed Occupancy of Accommodation including decommissioning workers across all three districts – Effect on Local Tourism Sector

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Total number of bedspaces	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611	33,611
Actual number of bedspaces occupied	11,848	13,685	17,236	21,470	22,988	24,516	24,193	21,976	19,430	16,211	13,349	11,848
Total available bedspaces	21,763	19,926	16,375	12,141	10,623	9,095	9,418	11,635	14,181	17,400	20,262	21,763
Estimated no. construction workers	852	852	852	852	852	852	852	852	852	852	852	852

Construction workers + occupied bedspaces	12,700	14,537	18,088	21,307	22,322	23,840	25,368	25,045	22,828	20,282	17,063	14,201
Room occupancy incl. construction workers	38%	43%	54%	63%	66%	71%	75%	75%	68%	60%	51%	42%
Actual remaining bedspaces	20,911	19,074	15,523	12,304	11,289	9,771	8,243	8,566	10,783	13,329	16,548	19,410

Transport and Access

Construction

17.4.77. Consideration and a review of all shortlisted cumulative projects as per **Table 17-6** has been undertaken. Three schemes (ID 17, ID 26 and ID 28 of **Table 17-6**) in the cumulative shortlist are identified as having potential construction and operational traffic routes which could overlap with that of the Scheme.

17.4.78. ID 17 uses link three: A614 Selby Road South of North Common Road (as shown in Table 12-12 of **ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 4]**).

17.4.79. ID 26 and ID-28 use link twenty-five: A161 between M180 J2 and the A18 (as shown in Table 12-12 of **ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 4]**). **ES Appendix 17.3 Transport Assessment Table [Document Reference 6.3.17.3 Revision 2]** includes a summary of each of the schemes listed at **Table 17-6.** For those that have not been included in this Transport and Access cumulative assessment, justification is included relating to why they are not assessed. **ES Appendix 17.3 Transport Assessment Table [Document Reference 6.3.17.3 Revision 2]** has been based upon information available within the public domain at the time of writing.

17.4.80. This section therefore considers link three and link twenty-five (identified at **Table 12-12 of ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 4]**). There are no forecast cumulative effects on any other links at this stage, based on the information currently available within the public domain.

ID17

17.4.81. The ES prepared for the planning application for cumulative scheme ID 17 suggests that "*For the purpose of the EIA and the assessment process, it is also assumed that the anticipated first sub phase of development, including the above-mentioned site preparation and infrastructure works will take between 12 and 18 months. Following this, it is assumed that the development will be delivered over a 10-year period (currently anticipated to run from 2026 to 2036).*" The construction period for Site ID 17 and the Scheme could therefore overlap. However, no construction traffic information appears to be available.

17.4.82. Whilst there is no data available for AADT flows for either the construction or operational phases, the planning submission does include peak hour trips for once the site is operational.

17.4.83. This suggests that once fully constructed Site ID 17 could be associated with up to 1,070 vehicles in the AM peak and 913 in the PM peak. With reference to the trip calculations in Appendix D of the submitted Transport Assessment, the peak hours equate to around 10 percent of the overall daily trips. As such, an estimated AADT for Site ID 17 is 9,920 vehicles, of which 1,182 could be HGVs.

ID26

17.4.84. The Transport Statement prepared for the planning application for cumulative scheme 26 suggests that the proposals (redevelopment of the golf course) could be associated with 400 AADT movements once operational.

ID28

17.4.85. The Construction Traffic Management Plan prepared for the planning application for cumulative scheme 28 suggests that the proposals (a solar farm) could be associated with 18 daily movements.

Cumulative Assessment

17.4.86. As a robust assessment, the cumulative effects of the Schemes construction phase, Site ID 17's operational phase, Site ID 26's operational phase and Site ID 28's construction phase have been considered, as set out in **Table 17-20**.

Table 17-19 Cumulative Assessment of Link Three and Twenty-Five

Link	2023 Baseline Two-Way AADT	With Total Cumulative Traffic Flow	Additional Two-way traffic Cumulative Total Traffic Flow (%age impact shown in square brackets)		Traffic Flow Magnitude of Impact	
			Total Veh	HGVs	Total Veh	HGVs
Link Three A614 Selby Road, S of	6,457 (1,361 HGVs)	16,466 (2,425 HGVs)	10,009 [155%]	1,182 [86.8%]	High	High

Link	2023 Baseline Two-Way AADT	With Total Cumulative Traffic Flow	Additional Two-way traffic Cumulative Total Traffic Flow (%age impact shown in square brackets)		Traffic Flow Magnitude of Impact	
			Total Veh	HGVs	Total Veh	HGVs
the North Common Road						
Link Twenty-Five A161 between M180 J2 and A18	5,281 (419 HGVs)	5,739 (459 HGVs)	458 [8.7%]	40 [9.5%]	Low	Low

17.4.87. The sensitivity of link three is negligible (as set out at **ES Appendix 12.2 - Summary of Sensitive Receptors [Document Reference 6.3.12.2 Revision 2]**) and therefore the significance of effect is **negligible** and therefore **Not Significant**.

17.4.88. The sensitivity of link twenty-five is negligible (as set out at **ES Appendix 12.2 - Summary of Sensitive Receptors [Document Reference 6.3.12.2 Revision 2**) and therefore the significance of effect is **negligible** and therefore **Not Significant**.

Operation

17.4.89. **Paragraph 12.5.138 of ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 4]** confirms that the operational phase of the Scheme could be associated with around one visit per month (two two-way vehicle trips per day), typically undertaken via a 7.5 tonne van or 4x4 type vehicles.

17.4.90. It is therefore considered that the impacts of the operational phase of development will also be **Negligible (Not Significant)** with all identified cumulative developments.

Decommissioning

17.4.91. **Paragraph 12.5.141 of ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 43]** confirms that the activities involved in the decommissioning process for the Scheme are not yet known. **Paragraph 12.5.142 of ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 4]** suggests that the number of vehicles likely to be associated with the decommissioning are likely to be similar to those associated with the construction and therefore it is considered that the cumulative effects are likely to be in line with those assessed as part of the assessment of construction traffic (overall negligible impact significance).

17.4.92. With consideration to the assessment of the construction trips set out above, it is therefore concluded that the impacts of the decommissioning phase of development will also be **Negligible (Not Significant)** when considered cumulatively with all identified cumulative developments.

Mitigation and Enhancement

17.4.93. No further mitigation and enhancement measures are anticipated to those set out in the 'Mitigation by Design' section in **ES Chapter 12 Transport and Access [Document Reference 6.2.12 Revision 4]**.

Conclusion

17.4.94. In conclusion, **no significant** Transport and Access cumulative effects resulting from the assessment of the projects listed in **Table 17-6** of this document are anticipated during the construction, operation or decommissioning phases.

Noise and Vibration

17.4.95. Analysis of the short-listed schemes highlights that they are, in general, well removed from the Order Limits, at distances of 1km or more. In addition, they are generally screened by intervening buildings / structures which would further attenuate noise.

17.4.96. As an example, the development with ID reference 6 from **Table 17-6** above is 1.15km from the Order Limits. At this distance, noise from construction activities, i.e., solar panel frame supports, would be significantly attenuated, falling well

below the LOAEL level defined in **ES Chapter 13 Noise and Vibration [REP4-017]**. In addition, any ground borne vibration impacts would be imperceptible. Overall, the impact of construction noise and vibration on the identified cumulative sites would be **Minor (not significant)** at worst.

17.4.97. Increases in traffic movements during the construction phase of the Scheme has been shown to result in no significant changes in road traffic noise on any of the affected routes. i.e., changes of less than 1dB. To that end, any changes in road traffic volumes resulting from the cumulative schemes are not likely to be significant.

17.4.98. During the operational phase, noise levels from the Scheme would be around 15dB at cumulative site 6. This noise level is very low in absolute terms and unlikely to be audible, particularly given the proximity of the adjacent train lines and M18 motorway. Given this, operational noise is considered to be at the NOAEL level, resulting in a Negligible (not significant) noise impact.

17.4.99. Cumulative scheme ID 23 is seemingly a large project which is adjacent to the Order Limits to the east of the Scheme. This could result in some short duration construction noise and vibration impacts on receptors in the vicinity including Mosswood Manor and North Moor Farm. The significance of the cumulative impact would depend on a number of factors including the timings of any proposed works and the methods of construction used. In the absence of this information, it is not possible to accurately determine the impact significance though the works would be temporary in nature.

17.4.100. Cumulative scheme ID 23 is the construction of high voltage electricity cables which, as indicated in the available documentation, would not result in any operational phase impacts. Given this there are no cumulative noise impact during the operational phase.

17.4.101. The documentation submitted with Cumulative Site ID23 indicates a construction window of 2027 to 2031 which has the potential to overlap with the construction programme of the Scheme. Notwithstanding this, consideration of **Environmental Statement Figure 17.1 [Document Reference 6.4.17.1 Revision 2]** indicates that the boundary of the cumulative site would generally be more than 1km from any of the receptors identified in this Scheme. At these distances, construction noise from site ID23 is unlikely to give rise to any significant noise levels and by extension, any cumulative noise effects.

17.4.102. Heritage receptor Her05 in **ES Chapter 13 Noise and Vibration [REP4-017]** is approximately 225m from the boundary of ID23, therefore there is greater

potential for cumulative noise effects. The predicted construction noise level from the Scheme at this receptor is L_{Aeq} 49dB. On the basis of the Scheme assessment alone, no exceedance of the construction noise criterion is predicted. Whilst detailed construction noise information is not currently available for ID23, and therefore cumulative construction noise effects cannot be quantitatively assessed, the relatively low noise level predicted from the Scheme indicates that substantial additional noise from ID23 would be required before the construction noise criterion could be approached or exceeded. On this basis, no significant cumulative effect is anticipated, although this cannot be quantified at the present time due to the absence of detailed information for ID23.

17.4.103. Given the above, the cumulative noise and vibration effects from construction with the Scheme and ID23 are shown to be, at worst, **minor (not significant)**, with the operational effects remaining **negligible (not significant)** although cumulative effects associated with ID23 cannot be quantified due to the absence of detailed construction noise information for that project. The cumulative effects are unlikely to be significant.

17.4.104. Cumulative Scheme ID 26 is a planning consent for up to 40 short term accommodation units with associated leisure facilities on the site of the former golf course which was considered as NRO2 in **ES Chapter 13 Noise and Vibration [REP4-017].** As the golf course was considered sensitive to noise, but is not a residential development, it was not included in assessment Tables 13-20 and 13-22 of **ES Chapter 13 Noise and Vibration [REP4-017].**

17.4.105. The consent granted by North Lincolnshire Council under application reference PA/2025/1535 requires that the development starts within three years of the date of consent (July 2026). This would necessitate that the construction begins before July 2029. This could potentially overlap with the construction phase of the Scheme.

17.4.106. No detail is provided on the nature or duration of the construction phase for the consented development; therefore, it is not possible to conclude what, if any cumulative construction noise impacts would occur during construction of both schemes. The closest assessment location common to both schemes, is AL18, which may be exposed to noise levels of up to L_{Aeq} 60dB during construction of the solar panel supports. Given the distance to the consented temporary accommodation units (approximately 380m), it is unlikely that the construction of the temporary accommodation units would increase noise levels. On this basis, no significant cumulative effect is anticipated during the construction

phase, although this cannot be quantified at the present time due to the absence of detailed information for ID26.

17.4.107. During the operational phase of the Scheme, daytime noise levels of L_{Aeq} 37dB were predicted to NR02. With a +2dB weighting for a 'just perceptible' tone, this would give a rating level of L_{Ar} 39dB. No noise monitoring was undertaken at NR02 however a short duration, daytime survey was undertaken in the vicinity of the golf course as part of planning application PA/2025/1535. This survey gave a background sound level of L_{A90} 40dB. Based on this it is concluded that the rating noise level of the Scheme would fall below the prevailing daytime background sound levels in the vicinity of the closest accommodation unit at cumulative site ID26. This is an indication of the Scheme having a low noise impact in accordance with BS4142 and falling at the NOAEL in accordance with Table 13-3. This effect level would result in a **negligible** impact significance in accordance with the criteria in Table 13-4 of **ES Chapter 13 Noise and Vibration [REP4-017].**

17.4.108. No specific night-time predictions were made to receptor NR02 as it was not considered sensitive during the night-time period. That said, the noise contour plots presented in **Environmental Statement Figure 13-4 [REP2-060]** indicate that noise levels from the Scheme would fall below L_{Aeq} 30dB at the former golf course. This is very low in absolute terms and is unlikely to result in any adverse noise impact. It would be considered to be at the NOAEL in accordance with Table 13-3. This effect level would result in a **negligible** impact significance in accordance with the criteria in Table 13-4.

17.4.109. Given the above, and in summary, the cumulative noise and vibration effects of the Scheme and ID26 from construction are likely to be, at worst, **negligible (not significant)**, with the operational effects remaining **negligible (not significant)**.

17.4.110. Cumulative Scheme ID 28 (PA/2025/444) comprises a ground-mounted solar farm with associated infrastructure. Whilst this cumulative scheme falls within the precautionary noise ZOI, it is not considered likely to give rise to significant cumulative noise effects. Construction activities associated with solar farm development are generally temporary, localised and of relatively low noise intensity. ID 28 is located approximately 3 km from the Order Limits and there are no identified receptors that would be subject to materially elevated construction noise from both developments simultaneously. Any operational noise generated by ID 28 would be limited principally to inverter and transformer equipment and would be highly attenuated at distance. Given the separation between the developments, the absence of common noise-sensitive receptors likely to experience appreciable noise from both schemes, and the inherently

low operational noise emissions associated with solar farm development, significant cumulative noise effects are not anticipated. The information submitted for Cumulative Site ID 27 (Humber Carbon Capture Pipeline - from Drax to Easington) indicates that the development is currently at the pre-application stage with limited information available at this time. The information detailed within the scoping report for ID 27 submitted under planning inspectorate reference: EN0710003 indicates that noise and vibration would be considered as part of the application, though no specific details are available at this time. Further to this, the scoping report indicates that the study area for construction noise receptors is limited to 300m from their Order Limits. Whilst there is potential for a small degree of overlap in the receptor populations considered by the two assessments, the approximately 3km separation distance between the Scheme and the proposed pipeline, together with the linear nature of the pipeline development and the limited extent of its construction noise study area, would substantially reduce the likelihood of receptors experiencing material noise effects from both developments concurrently. Being a pipeline, it is assumed that operational noise would be minimal and at 3km from the Scheme, it is unlikely to result in any significant adverse noise impacts alone and in combination with the Scheme.

Air Quality and Greenhouse Gases

Construction

17.4.111. As stated in **ES Chapter 14 Air Quality and Greenhouse Gases [REP2-025]**, the traffic generated by the Scheme during construction is below screening criteria set out in the EPUK/IAQM guidance **[Ref 17-8]**. These screening criteria are designed to provide a threshold, below which the effects will be 'not significant,' regardless of baseline conditions. As such, it is judged that the cumulative effects of construction traffic emissions will be 'not significant.'

17.4.112. The IAQM guidance **[Ref 17-8]** is clear that, with appropriate mitigation measures in place, any residual construction dust effects from an individual site will be 'not significant'. The guidance also suggests that cumulative construction dust impacts are only likely where sites are within 250m of each other. Work would also have to be taking place concurrently in areas of both sites that are close to a receptor in order for cumulative effects to occur. Two cumulative sites have been identified in **ES Appendix 17.2 Cumulative Short List [Document Reference 6.3.17.2 Revision 2]** as being within 250m of the Order Limits (ID 23 and ID 26).

17.4.113. In accordance with the mitigation measures set out in **ES Appendix 14.5 Construction Mitigation [APP-119]**, if there is concurrent construction work on sites within 250m of each other, the construction contractors should "*hold regular liaison meetings with other high risk construction sites within 250m of the site boundary, to ensure plans are coordinated and dust and particulate matter emissions are minimised*".

17.4.114. It is anticipated that the construction sites within 250m would both adopt appropriate mitigation measures to limit emissions of dust, would hold the liaison meetings recommended above and would ensure that plans are coordinated to minimise impacts upon the most sensitive receptors. With these measures in place, the cumulative effect of construction activities should be **not significant**.

Operation

17.4.115. As stated in **ES Chapter 14 Air Quality and Greenhouse Gases [REP2-025]**, once operational, traffic generated by the Scheme is well below screening criteria set out in the EPUK/IAQM guidance **[Ref 17-8]**. These screening criteria are designed to provide a threshold, below which the effects will be 'not significant,' regardless of baseline conditions.

17.4.116. As such, it is judged that the cumulative effects of Scheme-generated road traffic emissions will be **not significant**.

Greenhouse Gases

17.4.117. GHG emissions from all projects will contribute to climate change; globally, not just locally. As set out in the IEMA guidance **[Ref 17-9]**:

"Effects of GHG emissions from specific cumulative projects therefore in general should not be individually assessed, as there is no basis for selecting any particular (or more than one) cumulative project that has GHG emissions for assessment over any other."

17.4.118. This statement relates to 'cumulative' on a global scale. The definition of 'cumulative effects' in the context of GHGs and climate change therefore goes far beyond the typical definition of cumulative effects for EIA, which tends to focus on other proposed projects in the vicinity of the Scheme. The IEMA guidance recognises that any individual project in isolation would unlikely significantly affect global warming and climate change except within the context of global anthropogenic emissions. As such, the assessment in following the

IEMA approach is intrinsically cumulative and the cumulative GHG effects are judged to be **not significant**.

Agricultural Circumstances

17.4.119. The cumulative assessment has included the North Humber to High Marnham NSIP [EN020034] (ID 23). The agricultural land affected by that proposal has been assessed in the PEIR submitted as part of that proposal **[Ref 17-10]** from the provisional ALC maps, as including large areas of Grade 2, some Grade 1, and undifferentiated Grade 3 in the southern parts of the site. The PEIR submitted for the North Humber to High Marnham DCO concludes that with standard practice measures implemented during the construction and operational phases, the effects are considered to be not significant.

17.4.120. The six additional cumulative schemes considered as part of the cumulative effects assessment update are not part of the same farm holding, agricultural business or operational agricultural unit as the Scheme. In addition, none of the cumulative schemes introduce a pathway for cumulative effects on agricultural land resources within the study area beyond those already considered through the assessment of the North Humber to High Marnham scheme. Consequently, no additional cumulative agricultural effects, including effects on BMV land, have been identified and the conclusions of the assessment remain unchanged.

17.4.121. The estimated amount of BMV in England is 4.8 million hectares, with an estimated 3.7 million hectares in active agricultural use. The effect of the Scheme on the quantum of BMV agricultural land available is minor. The effect of the loss of BMV agricultural land with the North Humber to High Marnham NSIP was assessed in the PEIR provided as part of that application **[Ref 17-10]** as not significant. The availability of agricultural land, including BMV, as a resource will not be significantly affected. The cumulative impact is therefore assessed as a **minor adverse effect (not significant)**.

Other Environmental Topics

Major Accidents and Disasters

17.4.122. The shortlist of other cumulative schemes for the cumulative effects assessment for this DCO application set out in **Table 17-6** in this chapter are generally large-scale developments, primarily residential or mixed-use residential and also solar farm and battery storage applications. The majority of the shortlisted other developments are not located in the immediate proximity of the Order Limits to have any notable cumulative effects. The potential for

cumulative effects pertaining to the construction phase of the Scheme in tandem with all cumulative schemes set out in **Table 17-6** of this chapter are not anticipated to be significant.

17.4.123. With regard to the North Humber to High Marnham DCO application (EN020034) (ID 23), a scheme to reinforce the transmission network with a new 400 kV electricity transmission line, there are no anticipated significant cumulative effects. This cumulative scheme is adjacent to Land Parcel E of the Order Limits.. Land Parcel E includes the RWE onsite Substation and 400kv underground cabling to edge of the Order Limits, potentially routing to part of the developable eastern boundary of Land Parcel E. . It is unlikely there will be any interference with the North Humber to High Marnham scheme as no above ground works are proposed. Health and Safety restrictions will apply to the North Humber to High Marnham DCO application (as with this Scheme), which would limit the exposure of receptors to significant risk. If necessary, suitable offsets would be provided to the North Humber to High Marnham DCO application in relation to the Scheme, and to be considered at the detailed design stage.

17.4.124. Cumulative scheme ID 26 , 40 short term accommodation units at The Lincolnshire Golf Club, Crowle Road, Belton, is 50m east of the Scheme. Land Parcel E of the Scheme is adjacent to cumulative scheme ID 26, with solar PV panel infrastructure within Development Parcel E12 in close proximity. Due to the size, nature and scale of cumulative scheme ID 26, no significant effects relating to major accidents and disasters are considered likely with no assessment reporting on this matter within cumulative scheme ID 26 planning application documentation (PA/2025/1535). The infrastructure within Development Parcel E12 is unlikely to interfere with cumulative scheme ID 26 to cause a significant cumulative effect in regard to major accidents and disasters. The RWE onsite Substation and co located BESS containers in Land Parcel E are approximately 1km from cumulative scheme ID 26 providing a separation distance buffer in the unlikely event of a fire. Therefore, no additional mitigation is required beyond the mitigation delivered through the Scheme.

17.4.125. Additionally, with the implementation of the detailed Construction Environmental Management Plan, Decommissioning and Environmental Management Plan and Battery Safety Management plan in line with the general principles set out in the **Outline Construction and Environmental Management Plan [REP4-045]**, **Outline Decommissioning and Environmental Management Plan [REP5-026]** and **Outline Battery Safety Management Plan [REP5-028]** and the mitigation set out in the Major Accidents and Disaster section in **ES Chapter 16 Other Environmental Topics [REP2-027]**, no

significant effects are anticipated from the Scheme alone. For these reasons, it is concluded that no significant cumulative effects would arise.

Waste

17.4.126. Cumulative effects could occur if the construction or decommissioning phases of the Scheme coincide with the equivalent phases on other cumulative schemes as there would be waste from multiple sites needing management. In particular, this is relevant to the shortlisted cumulative energy generation schemes (ID 18 Land north of Chapel Lane, Keadby (PA/SCR/2021/8), ID 24 Fenwick Solar Project (EN010152), ID 25 North Lincolnshire Green Energy Park (EN010116) and ID 28 Land off Ealand Road (PA/2025/444)), due to the similar nature of the waste streams needing to be managed. This could create pressure on the capacity of local recycling plants or landfill sites.

17.4.127. A new industry is emerging for the recycling of solar panels, and the resale of any operational panels. These streams could be explored during the decommissioning phase of the Scheme, as technology is assumed to have advanced at the end of the Scheme's operational life.

17.4.128. Potential cumulative volumes of waste would be managed through the detailed Construction and Environmental Management Plan and Decommissioning and Environmental Management Plan, produced at the detailed design stage broadly in line with the general principles set out in the **Outline Construction and Environmental Management Plan [REP4-045]** and **Outline Decommissioning and Environmental Management Plan [REP5-026]**. In addition, the OCEMP secures that a Site Waste Management Plan will be produced for the Scheme post consent and prior to the construction phase. Consultation with waste management providers would be undertaken to ensure that waste can be accommodated. With mitigation measures in places, it is assumed that adequate management of waste arisings and therefore it is considered that no significant cumulative effects would arise.

Electric and Electromagnetic Fields (EMFs)

17.4.129. The shortlist of cumulative sites for this DCO application are predominantly residential and mixed-use residential developments, with separation distances of at least 1km. Cumulative scheme ID 26 , 40 short term accommodation units at The Lincolnshire Golf Club, Crowle Road, Belton, is 50m east of the Scheme. Electrical cables will be laid within Land Parcel E of the Scheme to connect solar panel PV infrastructure and the RWE onsite Substation and co located BESS containers. However, within the Order Limits of the Scheme, public and

occupational exposure limits of EMFs are not breached, and therefore cumulative scheme ID 26 within close proximity to the Order Limits will not be impacted. These cumulative schemes will not have any interaction with the Scheme to cause combined effects from EMFs.

17.4.130. Four cumulative schemes are energy generation developments, primarily solar farms and battery storage applications (ID 18 Land north of Chapel Lane, Keadby (PA/SCR/2021/8), ID 24 Fenwick Solar Project (EN010152), ID 25 North Lincolnshire Green Energy Park (EN010116) and ID 28 Land off Ealand Road (PA/2025/444)). These schemes also have separation distances of at least 1.8 km to the Scheme. High voltage underground cabling is associated with these cumulative schemes that could potentially create increased magnetic fields through multiple sources if they overlap. Although it is noted that it is not as simple as to add together magnetic fields from multiple sources, this is only true for magnetic fields that are exactly in line. When the magnetic fields are not in line, the sum is less. For the four cumulative energy generation schemes considered, at the time of writing, it is understood the associated high voltage underground cabling are proposed to connect into different National Grid Substations than the point of connection for the Scheme and therefore it is anticipated there will not be any interaction with the Scheme to cause combined effects from EMFs.

17.4.131. With regard to the North Humber to High Marnham DCO application (EN020034) (ID 23), a scheme to reinforce the transmission network with a new 400 kilovolt (kV) electricity transmission line, this scheme is adjacent to Land Parcel E of the Order Limits. Land Parcel E includes the RWE onsite Substation and 400kv underground cabling to edge of the Order Limits, potentially routing to part of the developable eastern boundary of Land Parcel E. The new 400 kV electricity transmission line (ID 23) will not overlap with any 400kv underground cabling within the Order Limits, and therefore no combined magnetic field above the ICNIRP guidelines for public exposure will be able to be produced. The North Humber to High Marnham scheme will also need to comply with the ICNIRP guidelines for public exposure, and will be at minimum height of 7m above ground. Therefore, no interaction with cabling associated with the Scheme is anticipated to interact with the North Humber to High Marnham scheme to cause any EMF effects. As such, it is considered that no significant cumulative effects would arise.

17.5. In Combination Effects

17.5.1. This section of the chapter reports the results of the in-combination effects assessment associated with the construction, operation and decommissioning

of the Scheme. In-combination effects result from the different types of effects generated by the Scheme having a combined effect on the same receptors.

17.5.2. In-combination effects occur when receptors are subject to residual effects under more than one environmental topic. As such, the residual effects presented in (**ES Chapters 6 – 15**) (regardless of whether they are classed as significant or not significant) have been reviewed to identify receptors subject to one or more types of effect to ensure that the interrelationship between each of the aspects of the environment likely to be affected by the Scheme has been properly evaluated and considered.

17.5.3. In-combination effects have been considered during the construction, operation, and decommissioning phases of the Scheme. In light of the comprehensive range of embedded design measures, effect interactions have only been presented in **Table 17-15** and **Table 17-16** where residual adverse or beneficial effects of at least minor in at least one receptor group have been identified.

17.5.4. The following receptor groups that have the potential to be subject to in-combination effect interactions have been identified:

- Residential receptors;
- Users of Public Rights of Way (PRoW);
- User of transport networks;
- Soils; and
- Ecological Receptors.

17.5.5. **Table 17-21** and **Table 17-22** provide a qualitative assessment of the in-combination effect interactions on these receptor groups. Construction and decommissioning have been presented together because the types of effect interactions would be broadly the same with decommissioning effects likely to be less significant than the construction phase.

17.5.6. No significant adverse in-combination effects have been identified.

Table 17-20 Assessment of In-Combination Effect Interactions During Construction and Decommissioning

Receptor Group	Description of potential effect interaction	Residual significance of effect determined through EIA		Effect interactions
Landscape and Visual, Air Quality and Noise and Vibration				
		Landscape and Visual	**Air Quality and Noise and Vibration**	
Residential Receptors	Visual effects on several individual properties which have clear, open views across part of the Scheme, which are not blocked by other properties. Temporary noise effects during the constriction and decommissioning period. Air quality effects from dust soiling and emissions of NO_2,	No effect to moderate adverse (significant)	Negligible (not significant)	Effects from noise and vibration are controlled through construction buffer zones for specific activities. For both air quality and noise and vibration effects are controlled via the detailed management plans with the general principals set out in the **Outline Construction Environmental Management Plan [REP4-045]** and **Outline Decommissioning Environmental Management Plan [REP5-026]**.

	PM_{10} and $PM_{2.5}$ from construction traffic			Landscape mitigation has been included within the design of the Scheme which includes further offsetting and new vegetation planting to help minimise impacts. It is acknowledged that the isolated visual effect is assessed as significant, however this is highly localised to those receptors in close proximity to the Order Limits, limited in nature, and also temporary during the construction and decommissioning periods. The visual effect is not expected to increase due to the air quality and noise effects as they are considered negligible (not significant), and therefore it is unlikely that the resultant in-combination effect will generate a significant effect.
Landscape and Visual and Transport and Access				

		Landscape and Visual	Transport and Access	
Users of Public Rights of Way (PRoW)	Visual effects for users of PRoW which pass through or are located close to the Scheme. This applies to those sections which have clear, open views across parts of the Scheme which are not blocked by existing hedgerows or other vegetation. Transport assessment considers effects on non-motorised user amenity and non-motorised user delay.	No effect to Major (significant)	Negligible to Minor (not significant)	Effects from transport and access are controlled through the provision of the detailed Construction Traffic Management Plan in line with the general principals set out in **Outline Construction Traffic Management Plan [REP3-041]**. Landscape mitigation is included as part of the design of the Scheme, which includes further offsetting and new vegetation planting to help minimise impacts. It is acknowledged that the isolated visual effect is assessed as significant, however this is highly localised to those receptors in close proximity to the Order Limits, limited in nature, and also temporary during the construction and decommissioning periods. The visual effect is not expected to

				increase due to the transport effect as it is considered negligible - minor (not significant), and therefore it is unlikely that the resultant in-combination effect will generate a significant effect.
Users of transport networks	Visual effects for users of a number of roads which pass through or within close proximity to the Scheme. The highest level of effects are for those views which are not blocked by existing hedgerows or other vegetation. Transport assessment considers effects on vehicular traffic flows, road safety and driver delay.	No effect to Major / Moderate (significant)	Negligible to minor (not significant)	Effects from transport and access are controlled through the provision of the detailed Construction Traffic Management Plan in line with the general principals set out in **Outline Construction Traffic Management Plan [REP3-041]**. Landscape mitigation is included as part of the design of the Scheme, which includes further offsetting and new vegetation planting to help minimise impacts. It is acknowledged that the isolated visual effect is assessed as significant, however this is highly localised to those receptors in close proximity to the Order Limits,

				limited in nature, and also temporary during the construction and decommissioning periods. The visual effect is not expected to increase due to the transport effect as it is considered negligible - minor (not significant), and therefore it is unlikely that the resultant in-combination effect will generate a significant effect.
Ground Conditions and Agricultural Circumstances				
		Ground Conditions	**Agricultural Circumstances**	
Soils	Damage to soil structure, loss of topsoil / subsoil and damage by compaction or rutting.	Negligible (not significant)	Minor adverse (not significant)	Effects on soils from damage to soil structure are controlled through the provision of the detailed Soil Management Plan in line with the general principals set out in **Outline Soil Management Plan [REP1-036]**. Effects on soils in relation to ground

				conditions are controlled via the detailed Management Plans in line with the general principals set out in **Outline Construction Environmental Management Plan [REP4-045]** and **Outline Decommissioning Environmental Management Plan [REP5-026]**. The individual effects have been assessed as not significant, and therefore it is unlikely that in-combination they will generate a significant effect.
Ecology and Nature Conservation, Noise and Vibration and Air Quality				
		Ecology and Nature Conservation	**Noise and Vibration and Air Quality**	
Ecological Receptors	Loss and damage to habitats and also disturbance as a result of construction	Negligible to minor	Negligible (not significant)	The effect on ecology and nature conservation is controlled through the implementation of buffers

	activities. Effects from dust soiling and PM10/dust emissions on sensitive ecological features. Effects from construction and decommissioning noise and vibration. Effects from dust soiling and PM_{10}/dust emissions on sensitive ecological features.	beneficial (significant)		around watercourses and woodland. Pollution prevention and control measures included in the detailed Ecological Construction Management Plan in line with the general principals set out in **Outline Ecological Construction Management Plan [REP5-030]**. Tree root protection zones and native habitat creation in place of intensive arable production, which will help to increase biodiversity. Effects from noise and vibration are controlled through construction buffer zones for specific activities and via the detailed Management Plans in line with the general principals set out in **Outline Construction Environmental Management Plan [REP4-045]** and **Outline Decommissioning Environmental Management Plan [REP5-026]**. Air Quality effects are also controlled via the **Outline**

				Construction Environmental Management Plan [REP4-045] and **Outline Decommissioning Environmental Management Plan [REP5-026]**. The individual effects have been assessed as not significant, and therefore it is unlikely that in-combination they will generate a significant effect.

Table 17-21 Assessment of In-Combination Effect Interactions During Operation

Receptor Group	Description of potential effect interaction	Residual significance of effect determined through EIA	Effect interactions
Landscape and Visual, Air Quality and Noise and Vibration			

		Landscape and Visual	Air Quality and Noise and Vibration	
Residential Receptors	Visual effects on several individual properties which have clear, open views across part of the Scheme, which are not blocked by other properties. Effects on concentrations of NO_2, PM_{10} and $PM_{2.5}$ from road traffic. Noise and vibration effects on sensitive receptors as a result of operation activities.	No effect to moderate adverse (significant)	Negligible (not significant)	Measures to control operational noise effects have been embedded within the design such as siting noisier equipment away from sensitive receptors, use of acoustic barriers or the preferred use of noise reduced options for equipment where available. Air quality effects are controlled through good design and best practice. Landscape mitigation has been included within the design of the Scheme which includes further offsetting and new vegetation planting to help minimise impacts. It is acknowledged that the isolated visual effect is assessed as significant, however this is highly localised to those receptors in close

				proximity to the Order Limits and limited in nature, with many of the effects reduced by Year 15 following implementation of the landscape mitigation planting. The visual effect is not expected to increase due to the air quality and noise effects as they are considered negligible (not significant), and therefore it is unlikely that the resultant in-combination effect will generate a significant effect.
Landscape and Visual and Transport and Access				
		Landscape and Visual	**Transport and Access**	
Users of Public Rights of Way (PRoW)	Visual effects for users of PRoW which pass through or are located close to the Scheme. This applies to those sections which have clear,	No effect to Major (significant)	Negligible to (not significant)	The design of the Scheme includes a new Permissive Path creating a loop around Land Parcel A and connecting to the existing Thorne-19 PRoW. Landscape mitigation is

	open views across parts of the Scheme which are not blocked by existing hedgerows or other vegetation. Transport assessment considers effects on non-motorised user amenity and non-motorised user delay.			included as part of the design of the Scheme, which includes further offsetting and new vegetation planting to help minimise impacts. It is acknowledged that the isolated visual effect is assessed as significant, however this is highly localised to those receptors in close proximity to the Order Limits and limited in nature, with many of the effects reduced by Year 15 following implementation of the landscape mitigation planting. The visual effect is not expected to increase due to the transport effect as it is considered negligible (not significant), and therefore it is unlikely that the resultant in-combination effect will generate a significant effect.

Users of transport networks	Visual effects for users of a number of roads which pass through or within close proximity to the Scheme. The highest level of effects are for those views which are not blocked by existing hedgerows or other vegetation. Transport assessment considers effects on vehicular traffic flows, road safety and driver delay.	No effect to Major / Moderate (significant)	Negligible (not significant)	No transport mitigation is proposed once the Scheme is operational due to the low vehicular movements associated with the Scheme. Landscape mitigation is included as part of the design of the Scheme, which includes further offsetting and new vegetation planting to help minimise impacts. It is acknowledged that the isolated visual effect is assessed as significant, however this is highly localised to those receptors in close proximity to the Order Limits and limited in nature, with many of the effects reduced by Year 15 following implementation of the landscape mitigation planting. The visual effect is not expected to increase due to the transport effect as it is considered negligible (not significant), and therefore it is unlikely that the resultant in-

				combination effect will generate a significant effect.
Ground Conditions and Agricultural Circumstances				
		Ground Conditions	**Agricultural Circumstances**	
Soils	Damage to soil structure and future ground contamination	Negligible (not significant)	Minor adverse (not significant)	Maintenance of the operational Scheme will be controlled via the detailed Operational Environmental Management Plan in line with the general principals set out in **Outline Operational Environment Management Plan [REP5-024]**. The individual effects have been assessed as not significant, and therefore it is unlikely that in-combination they will generate a significant effect.
Ecology and Nature Conservation and Noise and Vibration				

		Ecology and Nature Conservation	Noise and Vibration	
Ecological Receptors	Habitat creation and enhancement measures implemented as part of the Scheme design. Operational noise effects.	Negligible to minor beneficial (not significant)	Negligible (not significant)	Measures to control operational noise effects have been embedded within the design such as siting noisier equipment away from sensitive receptors, use of acoustic barriers or the preferred use of noise reduced options for equipment where available. The design of the Scheme includes area of habitat creation and enhancement measures detailed within the detailed Landscape and Ecological Management Plan in line with the general principals set out in **Outline Landscape Ecological Management Plan [REP4-055]**. The establishments of the new habitats will create stronger and more ecologically resilient corridors. The

				individual effects have been assessed as not significant, and therefore it is unlikely that in-combination they will generate a significant effect.

17.6. Summary

17.6.1. This chapter has assessed the cumulative and in-combination effects associated with the construction, operation and decommissioning of the Scheme.

Cumulative Effects

17.6.2. Cumulative effects may arise where there is the potential for two or more developments that are reasonably foreseeable and/or consented, but not yet constructed or operational, within close enough proximity to the Scheme to lead to effects on the same receptor.

17.6.3. Cumulative effects assigned a rating of 'major' or 'moderate' are considered in general as significant and are identified in this summary chapter, however professional judgement is applied.

17.6.4. A summary of the cumulative effects assessment is provided in **Table 17-23** below.

Table 17-22 Summary of Cumulative Effects

Relevant Cumulative Scheme	Potential for cumulative effect	Mitigation required	Residual Cumulative Effect
Landscape and Visual			
ID 23 ID 28	Cumulative visual effects on nearby receptors	Mitigation planting embedded within the design of the Scheme.	Moderate adverse (**Not significant**)
ID 3 ID 6 ID 17 ID 18	No cumulative effect likely.	No mitigation required	**Minor (Not significant)**

ID 26 ID 27			
Ecology and Nature Conservation			
All identified sites	No cumulative effect likely.	No additional mitigation required to that already proposed for the Scheme in isolation	**No cumulative effects likely**
Cultural Heritage and Archaeology			
ID 23	Cumulative effect during construction and operation on Grade II listed Farmhouse approximately 100m east of Mosswood Grange Farmhouse (1083286)	No additional mitigation required to that already proposed for the Scheme in isolation	Less than substantial harm (**Not significant**)
	Construction and operation phase effect on the Isle of Axholme LC14 Policy Area (PEG218)	No additional mitigation required to that already proposed for the Scheme in isolation	Minor harm (**Not significant**)
Ground Conditions			
ID 6 ID 17	Human Health	No additional mitigation required to that already	**Negligible (Not significant)**

ID 18 ID 23	Surface water recourses	proposed for the Scheme in isolation	**Negligible (Not significant)**
	Bedrock / Controlled waters resources		**Negligible (Not significant)**
	Mineral Resource of Underlying Geology		**Negligible (Not significant)**
Water Resources			
ID 6 ID 17 ID 18 ID 23 ID 26	As all sites are required to manage water resources, flood risk and drainage it is considered cumulative effects are unlikely.	No additional mitigation required to that already proposed for the Scheme in isolation	Negligible (**Not significant**)
Socio Economics			
ID 18 ID 23 ID 24	Construction phase employment, contribution to economic output	No mitigation required	Major beneficial (**significant)**
ID 25 ID 27 ID 30	Construction and decommissioning accommodation demand on local tourism		Minor to moderate beneficial (**Not significant**)

	Construction and decommissioning accommodation demand on visitors		Minor to moderate adverse (**Not significant**)
	Operational employment		Moderate beneficial (**significant**)
	Operational business rates		Major beneficial (**significant**)
	Decommissioning employment and contribution to economic output		Moderate beneficial (**significant**)
Transport and Access			
ID 17 ID 27 ID 28	Cumulative transport trip rates	No additional mitigation required to that already proposed for the Scheme in isolation	Negligible (**Not significant**)
Noise and Vibration			
ID 6 ID 23 ID 26	Cumulative noise and vibration during construction	No additional mitigation required to that already proposed for the Scheme in isolation	Minor (**Not significant**)
ID 27 ID 28	Cumulative operation noise and vibration		Negligible

			(**Not significant**)
Air Quality and Greenhouse Gases			
ID 23	Construction dust effects	Measures set out in **ES Appendix 14.6 Construction Mitigation [APP-119]**, if there is concurrent construction work on sites within 250m of each other, the construction contractors should "hold regular liaison meetings with other high risk construction sites within 250m of the site boundary, to ensure plans are coordinated and dust and particulate matter emissions are minimised.	**Not significant**
	Road traffic emission generated by both developments	No additional mitigation required to that already proposed for the Scheme in isolation	**Not significant**
Agricultural Circumstances			
ID 23	Loss of BMV and agricultural land	No additional mitigation required to that already proposed for the Scheme in isolation	Minor adverse (**Not significant**)
Other Environmental Topics – Major Accidents and Disasters			
ID 23	Potential interaction with infrastructure within Land Parcel E (underground 400kV cabling)	Health and safety restrictions will apply to both schemes, and if necessary suitable offsets would be provided	**Not Significant**

		and considered at the detailed design stage	
ID 26	Potential interaction with infrastructure within Land Parcel E due to close proximity.	No additional mitigation required to that already proposed for the Scheme in isolation.	**Not Significant**
Other Environmental Topics - Waste			
ID 18 ID 24 ID 25 ID 28	Similar nature of waste streams could create pressure on the capacity of local recycling plans and landfill sites.	No additional mitigation required to that already proposed for the Scheme in isolation.	**Not significant**
Other Environmental Topics – Electric and Electromagnetic Fields			
ID 26	Electrical cabling within Scheme within close proximity. No EMFs to be produced above ICNIRP guidelines for public or occupational exposure within or outside of Order Limits.	No mitigation required	**Not significant**
ID 18 ID 24 ID 25 ID 28	High voltage underground cabling could potentially created increased magnetic fields through multiple sources if they overlap. All schemes are proposed to connect into different	No mitigation required	**Not significant**

	substations and therefore will not have any interaction with the Scheme.		
ID 23	400kv underground cabling in the Scheme could interact with the new 400 kilovolt (kV) electricity transmission line. Each will need to follow ICNIRP guidelines for public expose and are unlikely to interact with each other and therefore no significant effects are likely.	No mitigation required.	**Not significant**

17.6.5. The assessment of cumulative effects has considered the potential for effects from other developments in the area to combine with and intensify effects caused by the Scheme. Significant beneficial cumulative residual effects are identified for Socio Economics, with all other cumulative residual effects considered not significant.

In-Combination Effects

17.6.6. In-combination effects result from the different types of effects generated by the Scheme having a combined effect on the same receptors. In-combination effects occur when receptors are subject to residual effects under more than one environmental aspect. In-combination effects have been considered during the construction, operation, and decommissioning phases of the Scheme.

17.6.7. The following receptor groups were identified

- Residential receptors;
- Users of Public Rights of Way (PRoW);
- User of transport networks;

- Soils; and
- Ecological Receptors.

17.6.8. **Table 17-24** provides a summary of the in-combination effects as a result of the Scheme.

17.6.9. No significant adverse in-combination effects have been identified.

Table 17-23 Summary of In-Combination Effects

Receptor Group	Potential effect interaction	Significance of in-combination effect
Construction / Decommissioning		
Residential Receptors	Landscape and Visual, Air Quality and Noise and Vibration	**Not significant**
Users of Public Rights of Way (PRoW)	Landscape and Visual and Transport and Access	**Not significant**
Users of transport networks	Landscape and Visual and Transport and Access	**Not significant**
Soils	Ground Conditions and Agricultural Circumstances	**Not significant**
Ecological Receptors	Ecology and Nature Conservation, Noise and Vibration and Air Quality	**Not significant**
Operation		
Residential Receptors	Landscape and Visual, Air Quality and Noise and Vibration	**Not significant**

Users of Public Rights of Way (PRoW)	Landscape and Visual and Transport and Access	**Not significant**
Users of transport networks	Landscape and Visual and Transport and Access	**Not significant**
Soils	Ground Conditions and Agricultural Circumstances	**Not significant**
Ecological Receptors	Ecology and Nature Conservation and Noise and Vibration	**Not significant**

17.7. References

[Ref 17-1] Planning Inspectorate, 2024, Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment (last updated March 2025).

[Ref 17-2] Planning Inspectorate, 2018, Nationally Significant Infrastructure Projects - Advice Note Nine: Rochdale Envelope (last updated March 2025).

[Ref 17-3] Hyder Consulting, 1999, Guideline for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.

[Ref 17-4] Department for Energy Security and Net Zero, 2024, Overarching National Policy Statement for energy (EN-1)

[Ref 17-5] Department for Energy Security and Net Zero, 2024, National Policy Statement for renewable energy infrastructure (EN-3)

[Ref 17-6] Department for Energy Security and Net Zero, 2024, National Policy Statement for electricity networks infrastructure (EN-5)

[Ref 17-7] Ministry of Housing, Communities and Local Government, Ministry of Housing, Communities & Local Government (2018 to 2021) and Department for Levelling Up, Housing and Communities, 2024, National Planning Policy Framework (last updated February 2025)

[Ref 17-8] IAQM (2024) Guidance on the Assessment of Dust from Demolition and Construction v2.2.

[Ref 17-9] IEMA (2022) EIA Guide to: Assessing greenhouse gas emissions and evaluating their significance. 2nd edition

[Ref 17-10] Arcadis, 2025, North Humber to High Marnham Preliminary Environmental Information Report Volume 1: Chapter 13 Agriculture and Soils

[Ref 17-11] ONS, Business Register & Employment Survey (BRES) 2023

[Ref 17-12] Additionality Guide, Homes & Communities Agency, October 2014.

[Ref 17-13] Yorkshire and Humber Business Plan 2021/22, December 2021.

[Ref 17-14 Visitor Economy Strategy, City of Doncaster Council. 2019.

17.8. Glossary

Acronym	Definition
AADT	Annual Average Daily Traffic
BMV	Best and Most Versatile
CDC	City of Doncaster Council
CEA	Cumulative Effects Assessment
DCO	Development Consent Order
eCMP	Ecological Construction Management Plan
EIA	Environmental Impact Assessment
EMF	Electric and Electromagnetic Fields
EPUK	Environmental Protection UK
ERF	Energy Recovery Facility
ES	Environmental Statement
GHG	Greenhouse Gas Emissions
GVA	Gross Value Added
IAQM	Institute of Air Quality Management
ICNIRP	The International Commission of Non-Ionizing Radiation Protection
IEMA	Institute of Environmental Management and Assessment
LCC	Lincolnshire County Council

LEMP	Landscape and Ecology Management Plan
LOAEL	Lowest-observed-adverse-effect level
LVIA	Landscape and Visual Impact Assessment
NOAEL	No-observed-adverse-effect level
NPS	National Policy Statement
NSIP	Nationally Significant Infrastructure Project
OCEMP	Outline Construction Environmental Management Plan
PEIR	Preliminary Environmental Information Report
PRoW	Public Rights of Way
PV	Photovoltaic
RDF	Refuse Derived Fuel
ZoI	Zone of Influence