

Tillbridge Solar Project
EN010142

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Chapter 18: Cumulative Effects and Interactions
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18. Cumulative Effects and Interactions

18.1 Introduction

- 18.1.1 This chapter addresses the likely effect interactions and cumulative effects that may occur as a result of the Tillbridge Solar Project (hereafter referred to as ‘the Scheme’).
- 18.1.2 At Deadline 3, this chapter ~~has been~~was updated in response to the Examining Authority’s First Written Questions. At Deadline 4, updates were made following the Issue Specific Hearing 3. The document references have not been updated from the original submission. For the most up-to-date documents, the reader should access these through the **Guide to the Application [EN010142/APP/1.2 (Rev05Rev06)]** and Schedule 13 of the **Draft DCO [EN010142/APP/3.1(Rev04Rev05)]**.
- 18.1.3 Effect interactions may arise where combinations of impacts, which have been identified as part of the assessments reported within **Chapters 6 to 17** of this Environmental Statement (ES) **[EN010142/APP/6.1]**, are considered likely to result in a new or different likely significant effect, or an effect of greater significance, than any one of the impacts on their own. This can happen during construction, for example, if a receptor is subjected to noise, dust, and visual impacts associated with site works.
- 18.1.4 Cumulative effects are 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.
- 18.1.5 This chapter is supported by the following appendix of this ES **[EN010142/APP/6.2]**:
- a. **Appendix 18-1: List of Cumulative Developments.**
- 18.1.6 The chapter is also supported by the following figures of this ES **[EN010142/APP/6.3]**:
- a. **Figure 18-1: Cumulative Developments;**
 - b. **Figure 18-2: Combined Zone of Theoretical Visibility (ZTV) of the Scheme’s Solar Panel Area Barrier ZTV within 5km buffer and West Burton Solar Project’s Solar Panel Area Barrier ZTV within 5km buffer;**
 - c. **Figure 18-3: Combined ZTV of the Scheme’s Solar Panel Area Barrier ZTV within 5km buffer and Cottam Solar Project’s Solar Panel Area Barrier ZTV within 5km buffer;**
 - d. **Figure 18-4: Combined ZTV of the Scheme’s Solar Panel Area Barrier ZTV within 5km buffer and Gate Burton Energy Park’s Solar Panel Area Barrier ZTV within 5km buffer; and**
 - e. **Figure 18-5: Transport Cumulative Traffic Routes.**

18.2 Legislative Context

Effect Interactions

- 18.2.1 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 18-1) make explicit reference to the requirement for an assessment of the effect interactions between types of effect, and states that:

“The EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors- ...(e) the interaction between the factors referred to in sub-paragraphs (a) to (d).”

- 18.2.2 No further guidance or requirement beyond the need for an assessment of the interrelationships between types of effect is provided.

Cumulative Effects

- 18.2.3 Schedule 4 Part 5 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires an ES to include:

“A description of the likely significant effects of the development on the environment resulting from, inter alia: ...(e) 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...

The description of the likely significant effects on the factors specified in regulation 5(2) should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development”.

18.3 Consultation

- 18.3.1 A request for an Environmental Impact Assessment (EIA) Scoping Opinion was sought from the Secretary of State through the Planning Inspectorate (PINS) in 2022 as part of the EIA Scoping Process. Consultation responses in relation to Cumulative Effects and Interactions are presented in **Table 18-1**.
- 18.3.2 Further consultation in response to formal pre-application engagement was undertaken through the Preliminary Environmental Information Report (PEI Report). **Table 18-2** outlines the statutory consultation responses relating to cumulative effects and interactions and how these have been addressed through this ES. No additional comments were received during the subsequent round of targeted consultation.
- 18.3.3 A list of cumulative developments has been prepared, in consultation with local authorities, and is presented in **Appendix 18-1** of this ES **[EN010142/APP/6.2]**.

Table 18-1: Consultation matters raised and responses for cumulative effects and effect interactions

Consultee	Matter Raised	Response
PINS	In light of other proposed developments within the area, the ES must demonstrate that the thresholds for further assessment are not exceeded cumulatively on relevant transport links. <i>[with regards to air quality effects]</i>	Section 18.7 of this chapter presents the air quality assessment of cumulative construction traffic.
PINS	The ES must provide information on the cumulative nature of traffic movements during the operational phases and confirm these projections fall below the relevant thresholds set out in guidance.	As set out within Section 18.17 of this chapter, cumulative effects on traffic flows during the operational phase of the Scheme have been scoped out, as the number of trips associated with the Scheme is minimal. As such, the Scheme's contribution to traffic flows on the road network would be minimal.
PINS	The ES should also show regard to the quantity and quality of land that will be permanently and temporarily lost to the Scheme and the potential for cumulative impacts at a regional scale with other plans and projects that result in a reduction of available Best and Most Versatile (BMV) land.	This has been assessed within Section 18.15 as part of the Socio-economics and Land Use and Section 18.16 Soils and Agriculture cumulative effects assessment.
PINS	For the avoidance of doubt the ES should assess the cumulative impact of construction traffic on the Strategic Road Network (SRN) associated with other nearby solar developments as well as committed developments and highway improvements schemes.	This has been assessed within Section 18.7: Air Quality, Section 18.14: Noise and Vibration and Section 18.17: Transport and Access of this chapter.
PINS	If off-site [waste] disposal is required, an assessment of likely significant effects including intra-cumulative effects should be included within the ES.	This has been assessed within Section 18.18 of this chapter.
PINS	The ES should also consider the requirement for cumulative [waste] impacts to be assessed at	This has been assessed within Section 18.18 of this chapter.

Consultee	Matter Raised	Response
	decommissioning due to a number of solar farms in the local area also likely to be decommissioned at a similar timescale.	
Bassetlaw District Council	It is considered that [Agricultural Circumstances] is an important issue for the District, especially when considering these proposals cumulatively with other similar proposals.	This has been assessed within Section 18.15 as part of the Socio-economics and Land Use and Section 18.16 Soils and Agriculture cumulative effects assessment.
Lincolnshire County Council (LCC)	It is essential that the ES for Tillbridge Solar considers cumulative effects of these known Nationally Significant Infrastructure Projects (NSIPs) specifically with regard to impact and loss of agricultural land	This has been assessed within Section 18.15 as part of the Socio-economics and Land Use and Section 18.16 Soils and Agriculture cumulative effects assessment.
LCC	Cumulative Landscape and Visual effects should be assessed, particularly in regard to the Cottam Solar Project, West Burton Solar Project and Gate Burton Energy Park, which are in close proximity.	This has been assessed within Section 18.13 of this chapter as part of the Landscape and Visual Amenity Cumulative Effects Assessment.
North Kesteven District Council	The Council is satisfied that given the significant separation distance between the proposed Tillbridge Solar Scheme and the Heckington Fen Solar Park that there will be no other cumulative effects with Heckington Fen Solar Park which need to be factored into the ES; other than cumulative agricultural land use/BMV impacts	This has been assessed within Section 18.15 as part of the Socio-economics and Land Use and Section 18.16 Soils and Agriculture cumulative effects assessment.
UK Health Security Agency (UKHSA)	The cumulative effects assessment will need to consider this [housing affordability and availability] across the wider study area given the number of other NSIPs, but also identify the potential for any local effects.	This has been assessed within Section 18.15 of this chapter as part of the Socio-economics and Land Use Cumulative Effects Assessment.

Consultee	Matter Raised	Response
UKHSA	Any cumulative effect assessment should consider the impact on demand for housing by construction workers and the likely numbers of non-home-based workers required across all schemes.	This has been assessed within Section 18.15 of this chapter as part of the Socio-economics and Land Use Cumulative Effects Assessment.
West Lindsey District Council (WLDC)	Along with the proposed development, cumulatively, the four proposed solar projects would amount to over 4,150ha of mainly agricultural land, broadly between Gainsborough and Lincoln, being used for solar PV arrays and battery storage, along with associated infrastructure such as sub stations. The ES will need to be clear in each chapter, the individual environmental effects, but also the cumulative effects with the other solar projects.	An assessment of cumulative effects with other solar schemes is presented within this chapter.
WLDC	The Heritage chapter also needs to consider the potential for cumulative harm to heritage assets, from other committed developments. This should include the three other solar project NSIPs proposed within West Lindsey.	This has been assessed within Section 18.9 of this chapter as part of the Cultural Heritage Cumulative Effects Assessment.
WLDC	As with every chapter, the ES will need to consider the cumulative impact on Ecology, alongside the other three solar project NSIPs.	This has been assessed within Section 18.10 of this chapter as part of the Ecology and Nature Conservation Cumulative Effects Assessment.
WLDC	This section should consider the cumulative effects with the other 3 solar project NSIPs (and the effects arising from the loss of over 4000Ha of land to this form of development upon the local population).	This has been assessed within Section 18.15 as part of the Socio-economics and Land Use and Section 18.16 Soils and Agriculture cumulative effects assessment.
WLDC	Furthermore, it is critical that the [Landscape and Visual Impact Assessment] LVIA addresses the cumulative landscape and visual impacts that will arise with the other 3 solar project NSIPs.	This has been assessed within Section 18.13 of this chapter as part of the Landscape and Visual Amenity Cumulative Effects Assessment.

Consultee	Matter Raised	Response
WLDC	<p>It is noted that “Cumulative Effects” are proposed to be considered as a separate chapter.</p> <p>The development would, considered cumulatively with Island Green Power’s Cottam & West Burton Solar Projects, and Low Carbon’s Gate Burton Project – result in a potential cumulative impact of over 4000 hectares of land between Gainsborough and Lincoln, given over to solar and battery storage projects. It is considered therefore that each and every topic within the ES, must explicitly address the cumulative effects with other developments, including the other four nationally significant solar projects proposed within the district. This should be set out on a chapter-by-chapter basis.</p>	<p>This has been presented within Sections 18.7 to 18.18 of this chapter.</p>

Table 18-2: Main matters raised through the Statutory Consultation

Consultee	Summary of main matter raised	How has the matter been addressed?	Location of response in the chapter
<p>Various respondents (including Brampton Parish, Willingham By Stow Parish, WLDC, LCC, Glentworth Parish, Bassetlaw District Council and Section 47 respondents)</p>	<p>Concerns regarding cumulative effects of the Scheme with other solar developments in close proximity</p>	<p>This chapter presents an assessment of cumulative effects with other schemes in the area.</p> <p>In addition, a Joint Report on Interrelationships between Nationally Significant Infrastructure Projects [EN010142/APP/7.6] has been prepared and submitted with the Development Consent Order (DCO) application. This document outlines a summary of cumulative effects of the Scheme with Gate Burton Energy Park [EN010131], West Burton [EN010132] and Cottam Solar Projects [EN010133].</p>	<p>Sections 18.7-18.18 of this chapter</p> <p>Joint Report on Interrelationships between Nationally Significant Infrastructure Projects [EN010142/APP/7.6]</p>
<p>UK Health Security Agency</p>	<p>The cumulative effects assessment should consider the peak numbers of construction workers and non-home-based workers and a proportionate assessment undertaken on the impacts for housing availability and</p>	<p>The cumulative employment and accommodation effects of the Scheme are considered in Section 18.15 of this chapter. Cumulative effects have been assessed using the data on construction workers numbers available for the Scheme and</p>	<p>Section 18.15 of this chapter</p>

Consultee	Summary of main matter raised	How has the matter been addressed?	Location of response in the chapter
	<p>affordability and impacts on any local services. The assessment should also include potential impacts on tourist accommodation within the socio-economic assessment.</p>	<p>the other nearby cumulative schemes. The assessment found there to be no likely significant cumulative effect on accommodation or on local services.</p>	

18.4 Assessment Methodology

Effect Interactions

- 18.4.1 The assessment of effect interactions is based on the methodology described in **Chapter 5: EIA Methodology** of this ES [EN010142/APP/6.1] and considers the potential for several direct or indirect effects arising from the Scheme to give rise to an effect on a single receptor.
- 18.4.2 There are no specific, relevant guidelines on how the assessment of effect interactions should be undertaken, and so the assessment has been undertaken on a qualitative basis, using the results of the individual assessments, informed by professional judgement.
- 18.4.3 Potential sources of environmental effect are not identified specifically in this chapter; this chapter instead draws on the other technical assessments presented in **Chapters 6 to 17** of this ES [EN010142/APP/6.1] for the identification of receptors, likely effects, and their assessment. Similarly, this chapter draws from the other technical chapters for descriptions of aspects of the baseline environment, where required.
- 18.4.4 The embedded design mitigation and additional mitigation, where proposed in other technical chapters, is assumed to be implemented before consideration of the effects in this chapter. Therefore, residual effects identified in **Chapters 6 to 17** of this ES [EN010142/APP/6.1] have been considered in this chapter. Residual effects which are classified as negligible have been excluded from the assessment of the effect interactions as, by virtue of their definition, they are considered to be imperceptible effects to an environmental / socio-economic resource or receptor.
- 18.4.5 To ensure a robust worst-case assessment, landscape and visual residual effects during operation for year 1 (identified in **Chapter 12: Landscape and Visual Amenity** of this ES [EN010142/APP/6.1] are considered for the effect interactions (as opposed to the Year 15 impacts with full vegetation growth in summer).
- 18.4.6 Only receptors that are expected to be subject to more than one residual effect of minor significance or above have been included in the assessment. Receptors predicted to be affected by only a single effect (e.g. only noise) are excluded because there is considered to be no potential for effect interactions to take place.
- 18.4.7 The receptors or resources which may experience effect interactions are identified in **Table 18-3** below. Where more than one effect (of minor significance or above) on a particular receptor/resource has been identified, the potential for effect interactions has been assessed in Section 18.5 of this chapter.

Table 18-3: List of Sensitive Receptors considered in more than one ES chapter and the potential for effect interactions

Category	Description of receptors or resource	Potential effects	Potential for Effect Interaction
Neighbouring community facilities	Users of community facilities.	Air quality, noise and vibration, socio-economics and land use, landscape and visual amenity effects.	No. There are no community facilities which have been identified to experience multiple effects above the negligible effect category.
Neighbouring residential properties	Existing neighbouring residential properties within the immediate vicinity of the Scheme.	Air quality, noise and vibration, socio-economics and land use, landscape and visual amenity effects.	Yes – refer to Section 18.5 for further assessment.
Neighbouring businesses	Neighbouring businesses and their workers.	Air quality, noise and vibration, socio-economics and land use, landscape and visual amenity effects.	No. There are no neighbouring businesses which have been identified to experience multiple effects above the negligible effect category.
Local highway network	Road users surrounding the Scheme.	Transport and access effects and landscape and visual amenity effects.	No. Road users subject to traffic and transport impacts are not expected to experience any worse effect through exposure to landscape and visual effects.
Public transport network	Users of local public transport network (i.e., buses, rail).	Transport and access effects, and landscape and visual amenity effects.	No. Public transport users subject to traffic and transport impacts are not expected to experience any worse effect through exposure to landscape and visual effects.

Category	Description of receptors or resource	Potential effects	Potential for Effect Interaction
Non-motorised user routes	Users of footways, public rights of way and bridleways.	Air quality effects, transport and access effects, and landscape and visual amenity effects.	Yes – refer to Section 18.5 for further assessment. However, this relates to construction and decommissioning impacts only. There is no potential for effect interactions during the operational phase due to the absence of impacts identified.
Ecology	Ecological receptors and habitats in the local and regional area including protected species and designated habitats.	Air quality effects, noise and vibration effects, effects due to land take and disturbance, and water environment effects	Yes – however the assessment presented within Chapter 9: Ecology and Nature Conservation of this ES [EN010142/APP/6.1] inherently covers any combined effects on identified ecological features. As such, no further assessment on effect interactions is provided within this chapter.
Heritage assets	Below and above ground heritage assets, such as Conservation Areas, Scheduled Monuments, listed buildings and locally listed buildings.	Air quality, noise and vibration effects, landscape and visual effects, direct effects due to land take and disturbance, effects on setting.	Yes – however the assessment presented within Chapter 8: Cultural Heritage of this ES [EN010142/APP/6.1] inherently covers any combined effects on heritage assets. As such, no further assessment on effect interactions is provided within this chapter.

Category	Description of receptors or resource	Potential effects	Potential for Effect Interaction
Water environment	Surface water features (such as rivers, streams, ditches, and lakes) and groundwater assets	Direct effects due to works and contamination from existing ground conditions.	No. The risk of pollution from existing ground conditions is very low to low across the Order limits, and as such, it is not considered likely that mobilisation of pollution from existing ground conditions would lead to an increased adverse effect.

Cumulative Effects

- 18.4.8 The cumulative effects assessment methodology is based on the Planning Inspectorate’s Advice Note 17 (Ref. 18-2) on the assessment of cumulative effects, which identifies a four-stage approach, as follows:
- a. Stage 1 – Establish the study area and identify a long list of ‘other development’ (the ‘development schedule’);
 - b. Stage 2 – Identify a shortlist of ‘other development’ for the cumulative impact assessment;
 - c. Stage 3 – Information gathering; and
 - d. Stage 4 – Assessment.
- 18.4.9 The cumulative assessment has been undertaken on a topic-by-topic basis rather than scheme-by-scheme as recommended by Appendix 2 of the Planning Inspectorate’s Advice Note 17 (Ref. 18-2). This has been done so that a cumulative assessment of the Scheme with all identified cumulative developments could be provided. Information recommended to be provided by Appendix 2 of the Planning Inspectorate’s Advice Note 17 (Ref. 18-2) has still been presented.
- 18.4.10 In general, where the Scheme results in a negligible effect, it is not considered that the Scheme would significantly contribute to a cumulative effect with other developments. This is because, by virtue of their definition, negligible effects are considered to be imperceptible changes to an environmental / socio-economic resource or receptor. Therefore, the cumulative effects assessment presented within this chapter has focused on effects of the Scheme that are minor, moderate, and major.

Stage 1: Establishing the Long List of Other Developments

- 18.4.11 The Stage 1 activities focussed on establishing the Scheme’s likely Zone of Influence (Zol) associated with each of the environmental topic areas assessed in this ES. **Table 18-4** sets out the Zol identified within each environmental topic, which is in line with industry guidance and standards for assessment.

Table 18-4: Zol extents for assessment of cumulative effects

Environmental Topic	Zone of Influence (Zol) for cumulative effects
Air Quality (Construction and Decommissioning Dust)	250m
Air Quality (Construction and Decommissioning Traffic)	200m of modelled road links
Climate Change	N/A
Cultural Heritage (Designated Assets of high value)	5km

Environmental Topic	Zone of Influence (Zol) for cumulative effects
Cultural Heritage (Designated Assets)	3km
Cultural Heritage (Non-designated Assets)	1km
Aquatic and Terrestrial Ecology	2km
Aquatic and Terrestrial Ecology (International and National Nature Conservation Designations)	10km
Water Resources	2km
Human Health	Reflects other ES chapters
Landscape and Visual (Cable Route Corridor)	2km
Landscape and Visual (Principal Site)	10km
Noise – Construction and Decommissioning	300m
Noise - Operation	500m
Noise – Construction and Decommissioning Vibration	50m
Noise - Construction and Decommissioning Traffic	50m of modelled road links
Socio-economics and Land Use – Local economy and employment	60 minute drive time area
Socio-economics and Land Use – Community severance	1km
Socioeconomics and Land Use - Public Rights of Way (PRoW) and local land use and amenity	500m
Transport and Access	5km
Glint and Glare (ground-based receptors)	1km
Glint and Glare (aviation based receptors)	30km (with detailed assessment for large international aerodromes within 20km, military aerodromes within 10km and 5km for small aerodromes)
Ground Conditions	250m
Major Accidents and Disasters	10km

Environmental Topic	Zone of Influence (Zol) for cumulative effects
Telecommunications, Television Reception and Utilities	Order limits
Electric and Electro-Magnetic Fields	Order limits


18.4.12 A 10km search area was used to establish the Long List of Other Developments. A search for the following types of development was completed by reviewing relevant planning databases held by the Planning Inspectorate, West Lindsey District Council, Lincolnshire County Council, Bassetlaw District Council and Nottinghamshire County Council:

- a. DCO applications for NSIPs in England, contained in the Register of Applications on the National Infrastructure Planning website (Ref. 18-4);
- b. Local authority planning applications that represent ‘major developments’, the definitions and thresholds for which are set out in The Town and Country Planning (Development Management Procedure) (England) Order 2015 (Ref. 18-3);
- c. Any major development projects being progressed through other statutory procedures;
- d. Allocations identified in the adopted and emerging development plans of the local planning authorities; and
- e. Other relevant development plans and projects.

18.4.13 Each development within the Long List of Other Developments was reviewed to determine its status at the time of undertaking the assessment (January 2024) and was assigned a final status and tier, as described in **Table 18-5**, informed by the guidance and levels presented within the Planning Inspectorate’s Advice Note 17 and Appendix 1 of the Advice Note (Ref. 18-2).

18.4.14 The cumulative developments long list, which has been consulted on with the local authorities, is presented in **Appendix 18-1** of this ES **[EN010142/APP/6.2]**.

Table 18-5: Tier Status Criteria

Tier	Stage	Decreasing level of information likely to be available 
Tier 1	Under Construction	
	Permitted application(s), whether under the Planning Act 2008 or other regimes, but not yet implemented; Submitted application(s) whether under the Planning Act 2008 or other regimes but not yet determined.	
Tier 2	Projects in the Planning Inspectorate's Programme of Projects where a scoping report has been submitted.	
Tier 3	Projects in the Planning Inspectorate's Programme of Projects where a 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 on the relevant proposals.	
	Identified in other plans and programmes (as appropriate) which set the framework for future developments consents/approvals, where such a development is likely to come forward.	

Stage 2: Establishing a Short List of Other Developments

18.4.15 This stage involved reviewing the Long List of Other Developments to identify those to be taken forward (shortlisted) into the cumulative assessment.

18.4.16 The shortlisting process involved the application of inclusion/exclusion criteria and was informed by the professional judgement of the environmental specialists undertaking the EIA and through engagement with the relevant local authorities. The criteria for determining which other developments to shortlist to the cumulative effects assessments, included considering the temporal overlap of the other developments with the Scheme, the level of information available for them and their likelihood to result in cumulative effects with the Scheme on the basis of their scale or their potential to become a new receptor for effects from the Scheme.

18.4.17 Developments and projects that are already in existence, i.e. those which are completed and operational, were considered to form part of the environmental baseline conditions within which the Scheme is implemented (and treated as such within this ES).

- 18.4.18 Similarly, where other developments were expected to be completed prior to Scheme construction, and where the effects of those projects are fully determined, these were considered within the future environmental baseline adopted in the EIA.
- 18.4.19 In determining which of the developments should be shortlisted, a minimum level of information is necessary. In accordance with the Planning Inspectorate's Advice Note 17, generally only developments with at least an EIA Scoping Report or ES available were considered for shortlisting.
- 18.4.20 However, some exceptions to this were made. For example, if any non-EIA development was identified in close proximity, large in scale and/or particularly sensitive locations, this was also considered for shortlisting. With particular reference to solar development, given the presence of the Scheme and other solar DCOs in close proximity, any non-EIA solar developments identified in the Zol were also shortlisted.
- 18.4.21 The cumulative schemes short-listed into the assessment are identified within **Appendix 18-1** of this ES [EN010142/APP/6.2].

Stage 3: Gathering Information

- 18.4.22 This stage involved reviewing the available information relating to the shortlisted developments to establish the details of their likely environmental effects.
- 18.4.23 This considered factors including: the Zol of environmental topics assessed; the planned timescales for construction, operation and (where relevant) decommissioning; and details of their potential or likely significant effects.

Stage 4: Assessment

- 18.4.24 Stage 4 involved identifying where cumulative effects are likely to occur with the shortlisted developments and assessing the significance of those effects on environmental receptors and resources, taking into account any mitigation measures.

Cumulative Effects with Gate Burton Energy Park [EN010131], West Burton [EN010132] and Cottam Solar Projects [EN010133]

- 18.4.25 The Cable Route Corridor of the Scheme has been considered carefully in relation to Cottam Solar Project [EN010133] and Gate Burton Energy Park [EN010131], which are also proposed to connect to National Grid Cottam Substation, and West Burton Solar Project [EN010132] which is proposed to cross the Cable Route Corridor and make its connection at the National Grid substation at West Burton Power Station. The combined and shared Cable Route Corridor within the wider Scheme is shown in **Figure 1-1** of this ES [EN010142/APP/6.3].
- 18.4.26 Significant work has been undertaken to minimise cumulative effects associated with the Scheme and Gate Burton Energy Park [EN010131], West Burton [EN010132] and Cottam Solar Projects [EN010133] (hereafter referred to as 'the solar DCOs'). This has included devising the shared Cable

Route Corridor, adopting similar methodologies for the environmental assessment and managing consultation periods in a way that reduces confusion for communities and stakeholders. Due to the differences in projects, locations and teams, environmental assessment methodologies are similar but not always identical. The aim of this collaboration has been to reduce overall environmental and social effects of the schemes, particularly on communities close to the Cable Route Corridor and sensitive heritage and ecological receptors close to the River Trent.

18.4.27 Shared mitigation measures between the Scheme and the solar DCOs have been identified with regards to cultural heritage, ecology and transport. These are further described within Section 18.9, Section 18.10 and Section 18.17 of this chapter. In addition, the Scheme and the other solar DCOs have worked collaboratively to define the shared Cable Route Corridor around the former Cottam power station site, access to National Grid Cottam Substation, and with regards to access points from the local highway network. Further information on the collaborative approach can be found within the **Joint Report on Interrelationships between Nationally Significant Infrastructure Projects [EN010142/APP/7.6]** submitted with this DCO Application. However, it is noted that where the shared mitigation cannot be secured, this has not been relied upon for determining the significance of cumulative effects.

18.4.28 To inform the assessment presented within this chapter, the ESs for each of the solar DCOs (Ref. 18-7, Ref. 18-8, Ref. 18-9) have been reviewed and considered, and the relevant figures and conclusions assessed against those reached in respect of the Scheme. Consistent with the cumulative effects assessments undertaken within the solar DCOs ESs, the following two assessment scenarios have been considered:

- a. Scenario 1: All projects' ducts and cables are installed within a construction programme of 24-36 months. It is assumed all the ducts will be installed at once and launch and reception pits and trenches will be backfilled so the area can then be re-instated. The sequence and schedule for each project is not confirmed, therefore, as a worst case, four lots of separate cable-pulling activities were assumed. The access points, haul routes and compounds would remain in place for 24-36 months to enable the cable pulls.
- b. Scenario 2: The sequential installation of all projects' ducts and cables over a maximum 5-year period. The access points, haul routes and compounds would remain in place for up to 5 years.

Significance Criteria for Effect Interactions and Cumulative Effects

18.4.29 The significance of effect interactions (also referred to as combined effects) and cumulative effects has been determined in accordance with the criteria set out in **Table 18-6**. The terminology for significance of effect differs from the general assessment methodology, presented in **Chapter 5: EIA Methodology** of this ES [EN010142/APP/6.1], so that the significance of cumulative effects can be differentiated.

Table 18-6: Effect Interactions and Cumulative Effects Significance Criteria

Significance Category	Typical Descriptors of Effect
Very large (typically adverse only)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be very highly significant (positive or negative). Effects would be permanent for receptors of very high value.
Large (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be highly significant (positive or negative). Effects would be: <ul style="list-style-type: none"> • Widespread/large-scale for receptors of high value; • Permanent for a receptor or receptors of high value; • Localised for a receptor or receptors of very high value; or • Temporary for a receptor or receptors of very high value.
Moderate (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts of the Scheme in association with other development upon an individual or collection of environmental receptors would be significant (positive or negative). Effects would be: <ul style="list-style-type: none"> • Permanent for a receptor or receptors of medium value; • Localised for a receptor or receptors of high value; or • Temporary for a receptor or receptors of high value.
Slight (adverse or beneficial)	Where the combined impacts of the Scheme or cumulative impacts 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). Effects would be: <ul style="list-style-type: none"> • Permanent for a receptor or receptors of low value; • Localised for a receptor or receptors of medium value; or • Temporary for a receptor or receptors of medium value.

Significance Category	Typical Descriptors of Effect
Neutral	Where the combined impacts of the Scheme or cumulative impacts 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).
No significant effect interactions or no significant cumulative effect	Where the combined impacts of the Scheme or cumulative impacts of the Scheme along with other developments are not likely to lead to a change in the significance of effects at a receptor, when compared with considering these impacts in isolation.

18.4.30 Combined and cumulative effects that are of moderate, large or very large significance are considered significant effects in relation to the EIA Regulations. Slight and neutral effects are considered not significant.

18.4.31 The cumulative operational assessment considers the total effects of the Scheme and the other identified developments operating concurrently.

18.4.32 As the Scheme has an estimated design life of 60 years, it is not possible to predict what other developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. A high-level qualitative assessment of potential cumulative effects during decommissioning has been provided in the sections below.

18.5 Assessment of Effect Interactions

18.5.1 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. A matrix of the sensitive receptors/receptor groups that may experience effects identified across multiple ES chapters is provided in **Table 18-3**. The table also identified where these effects may lead to effect interactions. In summary, **Table 18-3** concluded that potential effect interactions can occur for the following receptors:

- a. Neighbouring residential properties; and
- b. Non-motorised user routes.

18.5.2 Heritage assets and ecological receptors were also found likely to experience effect interactions, however, the assessments presented within **Chapter 8: Cultural Heritage** and **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1] inherently cover any combined effects on these receptors. As such, no further assessment of effect interactions on these receptors is provided within this chapter.

18.5.3 **Chapter 14: Socio-economics and Land Use** of this ES [EN010142/APP/6.1] provides an assessment of multiple impacts on the value and quality of local land use and amenity within 500m of the Order limits, whilst this chapter reviews where individual receptors or receptor groups are impacted by multiple effects.

- 18.5.4 **Table 18-7** and **Table 18-8** summarise where a receptor has been identified to experience multiple effects above the negligible effect category in **Chapter 6: Air Quality, Chapter 12: Landscape and Visual Amenity, Chapter 13: Noise and Vibration and Chapter 16: Transport and Access** of this ES [EN010142/APP/6.1], as applicable. Representative receptor locations from the technical assessments have been used. It is considered that the beneficial effects with regards to employment and economic growth identified within **Chapter 14: Socio-economics and Land Use** of this ES [EN010142/APP/6.1] do not have the potential to combine with the adverse effects identified, and therefore, have been excluded from **Table 18-7** and **Table 18-8**.
- 18.5.5 During construction, the adverse effects may lead to an increased sense of disturbance, however, this effect would be short-term temporary, transient, and unlikely to be continuous throughout the construction period. The combined effects will be managed and minimised in accordance with the measures outlined in the **Framework Construction Environmental Management Plan (CEMP)** [EN010142/APP/7.8]. A residual **moderate adverse (significant)** effect has been identified at Hermitage Low Farmhouse, Common Lane residential receptor, and the non-motorised users of A631 and School Lane. It is considered that the effects during decommissioning would be no worse than those identified for construction in **Table 18-7**; management measures for decommissioning effects are set out within the **Framework Decommissioning Environmental Management Plan (DEMP)** [EN010142/APP/7.10].
- 18.5.6 During operation, there is the potential for effect interactions to occur, where residential receptors are affected by operational noise and visual effects. These are likely to result in a **moderate adverse (significant)** effect in Year 1 but will reduce to **slight adverse to neutral (not significant)** by Year 15 once landscaping has matured and screens the Scheme from views.

Table 18-7: Potential effect interactions during construction and decommissioning

Receptor Name	Air Quality	Noise and Vibration	Landscape and Visual	Transport and Access	Effect Interaction
Church Farm, School Lane (Noise receptor R1, LVIA VP 12, Transport ATC14)	Negligible to minor adverse (not significant) effect from construction dust	Above or equal to Lowest Observed Adverse Effect Level (LOAEL) and below Significant Observed Adverse Effect Level (SOAEL) (not significant) effect from PV panel construction Minor adverse (not significant) from construction traffic noise	Negligible adverse (not significant) effect from views of construction	Negligible (not significant) effects on School Lane	No significant cumulative effect
Heapham Village (Noise receptor R6, LVIA VP18, Transport ATC13 & ATC15)	N/A – outside the Zol for construction dust	Above or equal to LOAEL and below SOAEL (not significant) effect from PV panel construction	Negligible adverse (not significant) effect from views of construction	Negligible (not significant) effects on Common Lane	No significant cumulative effect
Hermitage Low Farmhouse, Common Lane (Noise receptor R10, LVIA VP2a, 2b, Transport ATC13 & ATC15)	Negligible to minor adverse (not significant) effect from construction dust	Above or equal to LOAEL and below SOAEL (not significant) effect	Moderate to major adverse (significant) effect from views of construction	Negligible (not significant) effects on Common Lane	Moderate adverse (significant) effect interaction

Receptor Name	Air Quality	Noise and Vibration	Landscape and Visual	Transport and Access	Effect Interaction
		from PV panel construction			
Manor Farm / Low Farm Cottage / Heapham Cliff Farm, Common Lane (Noise receptor R12, LVIA VP17, Transport ATC13 & ATC15)	Negligible to minor adverse (not significant) effect from construction dust	Above or equal to LOAEL and below SOAEL (not significant) effect from PV panel construction	Minor adverse (not significant) effect from views of construction	Negligible (not significant) effects on Common Lane	Slight adverse (not significant) effect interaction
Grange Farm / South View, Common Lane (Noise receptor R13, LVIA VP18, Transport ATC13 & ATC15)	Negligible to minor adverse (not significant) effect from construction dust	Above or equal to LOAEL and below SOAEL (not significant) effect from PV panel construction	Negligible adverse (not significant) effect from views of construction	Negligible (not significant) effects on Common Lane	No significant cumulative effect
Lowfield Farm (Noise receptor R23, LVIA VP CRC2, Transport ATC18)	Negligible to minor adverse (not significant) effect from construction dust	Above or equal to LOAEL and below SOAEL (not significant) effect from cable laying activities	Minor adverse (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity on Fillingham Lane	Slight adverse (not significant) effect interaction
Davidson's Farm / Ivy Cottage / Magin Moor Farm (Noise receptor R24, LVIA VP CRC2, Transport ATC18)	Negligible to minor adverse (not significant) effect from construction dust	Above or equal to LOAEL and below SOAEL (not significant) effect from cable laying activities	Minor adverse (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay	Slight adverse (not significant) effect interaction

Receptor Name	Air Quality	Noise and Vibration	Landscape and Visual	Transport and Access	Effect Interaction
				and amenity on Fillingham Lane	
Non-motorised users of A631 (Transport ATC1-ATC4, ATC6, ATC8, ATC10; LVIA VP1 and VP20)	N/A	Minor adverse (not significant) effect from construction traffic noise	Moderate adverse (significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Moderate adverse (significant) effect interaction
Non-motorised users of B1398 (Transport ATC5 & ATC7; LVIA VP4, VP7 and VP8)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) to moderate adverse (significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction
Non-motorised users of High Street (Transport ATC19; LVIA VP CRC2)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) effect from views of construction	Negligible (not significant) effects	Slight adverse (not significant) effect interaction
Non-motorised users of B1241 (Transport ATC20, ATC22, ATC23, ATC25)	N/A	Minor adverse (not significant) effect from construction traffic noise	N/A	Negligible to minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction

Receptor Name	Air Quality	Noise and Vibration	Landscape and Visual	Transport and Access	Effect Interaction
Non-motorised users of Tillbridge Road (Transport ATC24; LVIA VP CRC5)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction
Non-motorised users of Stow Park Road (Transport ATC26; LVIA VP CRC5)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction
Non-motorised users of Cottam Road (Transport ATC30)	N/A	Minor adverse (not significant) effect from construction traffic noise	N/A	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity Minor adverse (not significant) effect from fear and intimidation	Slight adverse (not significant) effect interaction
Non-motorised users of School Lane (Transport ATC14; LVIA VP12& VP19)	N/A	Minor adverse (not significant) effect from construction traffic noise	Negligible (not significant) effect to moderate adverse (significant) effect from views of construction	Negligible (not significant) effects	Moderate adverse (significant) effect interaction

Receptor Name	Air Quality	Noise and Vibration	Landscape and Visual	Transport and Access	Effect Interaction
Non-motorised users of Cow Lane (Transport ATC16, LVIA VP23)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction
Non-motorised users of Fillingham Lane (Transport ATC18; LVIA VP CRC2)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction
Non-motorised users of Kexby Lane (Transport ATC12, ATC17, ATC29; LVIA VP25 & VP9)	N/A	Minor adverse (not significant) effect from construction traffic noise	Minor adverse (not significant) to major adverse (significant) effect from views of construction	Negligible to minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction
Non-motorised users of Headstead Bank (Transport ATC31; LVIA VP CRC8)	N/A	Minor adverse (not significant) effect from construction traffic noise	Negligible (not significant) effect from views of construction	Minor adverse (not significant) effect with regards to severance, pedestrian delay and amenity	Slight adverse (not significant) effect interaction

Table 18-8: Potential effect interactions during operation

Receptor Name	Noise and Vibration	Landscape and Visual	Effect Interaction
Moorlands Magin Moor, Harpswell Lane A631 (Noise receptor R2; LVIA VP20 & VP1)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate adverse (significant) in Year 1 (winter) reducing to Negligible (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to neutral (not significant) with the maturing of landscaping
Hemswell Grange, Harpswell Lane A631 (Noise receptor R3; LVIA VP20 & VP1)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate adverse (significant) in Year 1 (winter) reducing to Negligible (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to neutral (not significant) with the maturing of landscaping
Springthorpe Grange, School Lane (Noise receptor R7; LVIA VP19)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate adverse (significant) in Year 1 (winter) reducing to Minor adverse (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to slight adverse (not significant) with the maturing of landscaping
Harpswell Low Farm, Harpswell Lane A631 (Noise receptor R8; LVIA VP20 & VP1)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate adverse (significant) in Year 1 (winter) reducing to Negligible (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to neutral (not significant) with the maturing of landscaping
Grange Cottage / Grange Bungalow / Harpswell Grange, Harpswell Lane A631 (Noise receptor R9; LVIA VP20 & VP1)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate adverse (significant) in Year 1 (winter) reducing to Negligible (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to neutral (not significant) with the maturing of landscaping
Hermitage Low Farmhouse, Common Lane (Noise receptor R10; LVIA VP 2a, 2b)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate to major adverse (significant) in Year 1 (winter) reducing to Minor adverse (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to slight adverse (not significant) with the maturing of landscaping

Receptor Name	Noise and Vibration	Landscape and Visual	Effect Interaction
Billyards Farm, Common Lane (Noise receptor R11; LVIA VP29)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Moderate adverse (significant) in Year 1 (winter) reducing to Minor adverse (not significant) in Year 15 (summer)	Moderate adverse (significant) reducing to slight adverse (not significant) with the maturing of landscaping
Manor Farm / Low Farm Cottage / Heapham Cliff Farm, Common Lane (Noise receptor R12; LVIA VP17)	Above or equal to LOAEL and below SOAEL (not significant) effect from noise emissions from the Scheme infrastructure	Minor adverse (not significant) in Year 1 (winter) and Year 15 (summer)	Slight adverse (not significant)

18.6 Assessment of Cumulative Effects

- 18.6.1 A number of other developments are considered to have the potential to generate cumulative effects with the Scheme based on their temporal scope, location and/or scale and nature. This includes the following three solar schemes that are also classified as NSIPs and will require a DCO, which are hereafter collectively referred to as ‘the solar DCOs’.
- a. Gate Burton Energy Park [EN010131];
 - b. West Burton Solar Project [EN010132]; and
 - c. Cottam Solar Project [EN010133].
- 18.6.2 In addition to the solar DCOs, other developments that have been identified within the cumulative developments list (**Appendix 18-1** of this ES **[EN010142/APP/6.2]**) for each technical discipline are listed below within each topic they may generate cumulative effects for and are assessed further for their potential to generate these cumulative effects.

18.7 Air Quality

Introduction

- 18.7.1 The Zol for the dust risk assessment is 250m from the Order limits and is presented in **Figure 18-1** of this ES **[EN010142/APP/6.3]**. This Zol is in place to cover the cumulative effects of dust generated during the construction and decommissioning phases. In addition to the solar DCOs, the other developments within the Zol with potential to generate cumulative effects with regards to dust are:
- a. ID 50. Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of Cottam Power Station; and
 - b. ID 76. Application Reference: 146100/ PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development.
- 18.7.2 These developments are shown on **Figure 18-1** of this ES **[EN010142/APP/6.3]**.
- 18.7.3 The Zol for the construction and decommissioning traffic is 200m of the modelled road links. Cumulative schemes summarised within Section 18.17: Transport and Access of this chapter and associated traffic flows summarised in **Appendix 6-3: Air Quality Modelling** of this ES **[EN010142/APP/6.3]** have been considered and the impacts on air quality as a result of the cumulative traffic flows assessed.

Cumulative Effects During Construction

- 18.7.4 There is the potential for cumulative effects during construction from fugitive emissions from construction activities, and from the movement of construction vehicles on the road network. Although it is noted that both the

Scheme and the cumulative developments identify effects of no greater significance than minor adverse for construction related activities.

- 18.7.5 Mitigation measures for managing dust emissions from the Scheme during construction are documented within the **Framework CEMP [EN010142/APP/7.8]**. These will ensure that off-site impacts are not significant. It is assumed that nearby construction sites, including the solar DCOs, will operate to a similar level of good practice in accordance with their own CEMPs, as set out in their respective applications (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13, Ref. 18-22). The cumulative effects of dust generation during construction would therefore be **neutral (not significant)**.
- 18.7.6 If other developments, particularly the solar DCOs, are being constructed at the same time as the Scheme, there is the potential for the total number of Heavy Goods Vehicles (HGVs) on the road network to cause a cumulative impact on air quality. Full details of the assessment of cumulative construction traffic are outlined in **Appendix 6-3: Air Quality Modelling** of this ES **[EN01042/APP/6.3]**. A detailed dispersion model was carried out using cumulative construction traffic flows, set out within Section 18.17 of this chapter.
- 18.7.7 The modelled results at all receptors, detailed in full in **Appendix 6-3: Air Quality Modelling** of this ES **[EN01042/APP/6.3]**, show that that all predicted annual mean concentrations of NO₂, PM₁₀ and PM_{2.5} are well below their respective UK Air Quality Strategy (AQS) objectives. All modelled annual mean NO₂ concentrations are additionally predicted to be below 60 µg/m³, the hourly AQS objective for NO₂ is also anticipated to be achieved with the cumulative construction traffic. Likewise, daily PM₁₀ concentrations are predicted to be well below 32 µg/m³ and, as such, the 24 hour PM₁₀ AQS objective is also anticipated to be achieved at all modelled receptor locations.
- 18.7.8 The predicted change in concentration as a result of increased cumulative traffic is estimated to be negligible at all modelled receptors. As such the cumulative traffic will have **no effect** on air quality within the Zol of the Scheme.

Cumulative Effects During Operation

- 18.7.9 There are not anticipated to be any cumulative effects on air quality during operation of the Scheme. This is because the solar farm components (i.e. solar panels, cable infrastructure) will not emit atmospheric pollutants. In addition, the number of staff working during operation is relatively small (10-12 people) and HGV and transit van deliveries to Site will be managed in line with the **Framework Operational Management Plan (OEMP) [EN010142/APP/7.9]**. If full solar PV panel and BESS replacement is required at some point during the lifetime of the Scheme, the activity on the road network would be considerably less intensive than during construction, and is anticipated to generate approximately 10% of the daily HGV/coach and car/LGV movements expected during peak construction of the Principal Site and Cable Route Corridor. An operational assessment of air quality has therefore been scoped out of the EIA for the Scheme and there is **no potential for significant cumulative effects**.

Cumulative Effects During Decommissioning

- 18.7.10 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction.
- 18.7.11 Mitigation measures for managing dust emissions during decommissioning are documented within the **Framework DEMP [EN010142/APP/7.10]** and it is assumed that any nearby construction/decommissioning sites would operate to a similar level of good practice in accordance with their own CEMPs/DEMPs. The cumulative effects of dust generation during decommissioning would therefore be **neutral (not significant)**.

18.8 Climate Change

- 18.8.1 The global atmosphere is the receptor for climate change impacts and has the ability for holding Greenhouse Gas (GHG) emissions. Regardless, as stated by Institute of Environmental Management and Assessment (IEMA) guidance (Ref. 18-10), all GHG emissions are considered significant and therefore would contribute to climate change. While the impact of any individual scheme may be limited, it is the cumulative impact of many schemes over time that could have a significant impact on climate change.
- 18.8.2 As such it is not possible to define a study area for the assessment of cumulative effects of GHG emissions, nor to undertake an all-encompassing cumulative effects assessment, as the identified receptor is the global climate and effects are therefore not geographically constrained. Consequently, as stated in the IEMA guidance (Ref. 18-10), effects of GHG emissions from specific cumulative projects 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.
- 18.8.3 Overall, the Scheme will deliver a beneficial, significant effect on GHG emissions, due to the substantial emissions reductions the Scheme will achieve in comparison to the without-project baseline (i.e. in a scenario where the Scheme does not go ahead and the power it would generate is provided by a fossil fuel generating station). Therefore, the Scheme will not contribute to any significant adverse effect on climate change.
- 18.8.4 The In-Combination Climate Impact (ICCI) assessment is, by nature, a cumulative assessment, and any effects are detailed in **Chapter 7: Climate Change** of this ES **[EN010142/APP/6.1]**. As the Climate Change Resilience (CCR) assessment is only concerned with the assets of the Scheme and a broader consideration of existing interdependent infrastructure, a cumulative assessment is not required.

18.9 Cultural Heritage

Introduction

- 18.9.1 The Zols for Cultural Heritage are 1km for non-designated heritage assets, 3km for designated assets and 5km for designated assets of high significance, as presented in **Figure 18-1** of this ES [EN010142/APP/6.3]. In addition to the solar DCOs, the other developments within the Zols with potential to generate cumulative effects on cultural heritage are:
- a. ID 4. West Burton C Power Station [EN010088];
 - b. ID 5. North Humber to High Marnham Energy Grid [EN020034];
 - c. ID 6. One Earth Solar Farm [EN010159];
 - d. ID 50. Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of Cottam Power Station;
 - e. ID 54. Application Reference 22/00831/SCR. Screening Opinion - Demolition of West Burton Power Station;
 - f. ID 55. Application Reference 22/01219/SCR. Screening Opinion - Demolition of West Burton Power Station;
 - g. ID 76. Application Reference: 146100/ PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development;
 - h. ID 79. Application Reference: PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure;
 - i. ID 110. Application Reference: 145239. A multi-use development comprising 2,046 residential units and various community facilities on Foxby Lane, Gainsborough;
 - j. ID 126. Application Reference 139890. County matter application PL-0130-19 for the erection of a gas transport filling station;
 - k. ID 132. Application Reference: 136937. A residential development comprising 750 units at land north-east of Highfields roundabout, Corringham; and
 - l. ID 174. Application Reference 147710. Request for a scoping opinion for proposed solar farm development at Stow Park.
- 18.9.2 Cumulative heritage impacts can be either physical or a result of changes to setting. Cumulative physical impacts are where an asset may be physically changed by two or more developments, thus increasing the loss of historic and/ or archaeological material. Impacts on setting may result where the observer is able to see two or more developments from one key view, or sequential where two or more views are affected.
- 18.9.3 Significant effects result where the cumulative change results in an erosion to, or total loss of, the ability to understand and appreciate the heritage value of an asset as a result of multiple impacts.

Cumulative Effects During Construction

- 18.9.4 In terms of buried archaeology, physical works associated with the construction of the developments listed at paragraph 18.9.1 have the potential to physically impact archaeological assets also impacted by the Scheme. Where these assets fall within the boundary of more than one development, there is potential for a greater loss of archaeological remains.
- 18.9.5 With reference to the other developments, there is potential for cumulative impacts to non-designated archaeological remains. This is particularly the case for the solar DCOs where there is overlap of Cable Route Corridors, and there is potential for the same heritage asset to be affected by more than one scheme. The use of a shared Cable Route Corridor, where possible, will minimise the land take required and the physical impacts to heritage assets during cable installation. This will include the coordinated use of trenchless cable crossing of railways and the River Trent where possible. Similarly, a coordinated programme of archaeological investigation and mitigation including combined areas of archaeological strip map and sample excavation, earthwork recording, and archaeological monitoring and recording is planned. The proposed archaeological investigation and mitigation will be submitted for approval and secured through the requirements of the respective DCOs for the Scheme and each of the overlapping solar DCOs. These measures will reduce the construction impacts across the cumulative developments and the Scheme, will minimise cumulative effects on archaeology during construction. Consequently, these are **not anticipated to be significant**.
- 18.9.6 In terms of built heritage, an assessment of how temporary construction activity may affect the setting of heritage assets has been completed in **Chapter 8: Cultural Heritage** of this ES [EN010142/APP/6.1]. A review of the solar DCOs indicates it is possible that cumulative effects during construction may arise on the following designated heritage assets due to the increased solar viewshed:
- a. Listed buildings within the settlement of Corringham;
 - b. Listed buildings within the settlement of Fillingham;
 - c. Listed buildings within Willingham by Stow;
 - d. Designated assets in relation to Stow Park; and
 - e. Designated assets in Cottam.
- 18.9.7 Assets in the locations identified above have either been scoped out of assessment for the Scheme, or effects on the relevant assets have been assessed as not significant. It is not considered that combined impacts from the cumulative schemes would raise the assessed level of impact from that already identified in **Chapter 8: Cultural Heritage** of this ES [EN010142/APP/6.1], considering the cumulative visual effects identified in Section 18.13 of this chapter in relation to the above locations including VP21 and VP8 being assessed as not significant.
- 18.9.8 Aside from the solar DCOs, the hydrocarbon wellsite in Glentworth (ID 135) may also give rise to cumulative effects on heritage assets identified within the Principal Site. These will be limited to additional changes within their

setting, which will **not be significant** when considered cumulatively taking into account the presence of another hydrocarbon wellsite already in operation in the vicinity.

- 18.9.9 The Cable Route Corridor has the potential to be shared along various stretches of its length by the other solar DCOs. The assessment in **Chapter 8: Cultural Heritage** of this ES [EN010142/APP/6.1] applied a worst-case assumption that the cable could be laid anywhere within the Cable Route Corridor, with exception to the avoidance areas where trenchless crossings are used, as a worst-case scenario. The cumulative effects with the other three schemes will therefore be the same as the worst-case effects scenario assessed for this Scheme alone, assuming the cable is within the Order limits and has the same level of mitigation secured. As such, **no significant cumulative effects** are considered likely during the construction of the Scheme.

Cumulative Effects During Operation

- 18.9.10 In terms of buried archaeology, impacts are limited to the construction phase, therefore there is no potential for significant cumulative effects during operation.
- 18.9.11 In terms of built heritage, operational impacts would be in relation to lighting, glint or glare, and noise and vibration. Review of the cumulative schemes suggests it is possible that cumulative effects during operation may arise due to the increased number of solar schemes, but cumulative impacts would not exceed those already assessed as not significant. While non-significant effects may be caused on an individual basis through changes to the setting of assets, the minor level of these effects and the wide geographical spread of the schemes means that these will not cumulatively increase the effects to such a level as to make them significant. As such, **no significant cumulative effects** on built heritage are considered likely during the operation of the Scheme.

Cumulative Effects During Decommissioning

- 18.9.12 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction.
- 18.9.13 In terms of buried archaeology, it is not anticipated that decommissioning would have any impact beyond the already-disturbed footprint of the Scheme. As such, there is **no potential for cumulative effects** during decommissioning.
- 18.9.14 In terms of built heritage, there is the potential for temporary setting impacts during the removal of the solar infrastructure. Once decommissioning of the Scheme is complete, the long-term adverse effects from the Scheme will have been reversed and will no longer exist due to the removal of solar

infrastructure and retention of landscaping, which would likely represent an improvement and may even mitigate any adverse effects caused by other developments that are being constructed or are operational at that point in time. It is therefore anticipated that the cumulative effects on built heritage during decommissioning would be **not significant**.

18.10 Ecology and Nature Conservation

Introduction

18.10.1 The Zol for Ecology and Nature Conservation is presented in **Figure 18-1** of this ES [EN010142/APP/6.3].

18.10.2 The Zol is up to 10km for the potential effects of the Scheme on international nature conservation designations, such as Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. The Zol would be extended to 30km where bats are a qualifying or cited interest feature, however, no such sites are located within 30km of the Scheme.

18.10.3 For the remainder of nature conservation designations, e.g., Sites of Special Scientific Interest (SSSIs), Local Nature Reserves (LNR) and Local Wildlife Sites (LWS), as well as protected and notable habitats and species, the Zol is 2km.

18.10.4 As such, in addition to the solar DCOs, a review of other developments within the 2km Zol identified the following schemes with the potential to generate cumulative effects:

- a. ID 5. North Humber to High Marnham Energy Grid [EN020034];
- b. ID 50. Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of Cottam Power Station;
- c. ID 76. Application Reference: 146100/ PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development;
- d. ID 79. Application Reference: PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure;
- e. ID 126. Application Reference 139890. County matter application PL-0130-19 for the erection of a gas transport filling station; and
- f. ID 174. Application Reference 147710. Request for a scoping opinion for proposed solar farm development at Stow Park.

18.10.5 Other developments within the 10km Zol with the potential to generate cumulative effects are:

- a. ID 4. West Burton C Power Station [EN010088];
- b. ID 6. One Earth Solar Farm [EN010159];
- c. ID 23. Application Reference: 20/01405/FUL. A solar farm and associated infrastructure at Tiln Farm, Retford;

- d. ID 36. Application Reference 17/01581/SCR. Solar farm and associated development at land north side of Lady Well Lane Hadon, Nottinghamshire;
- e. ID 37. Application Reference 20/00117/FUL. Installation and operation of a solar farm with associated infrastructure at land north-west and south of Field Farm, Wood Lane, Sturton Le Steeple, Nottinghamshire;
- f. ID 42. Application Reference: 21/01147/FUL. Installation of a solar farm and battery storage facility with associated infrastructure at land north and south Tuxford road, Skegby. Nottinghamshire;
- g. ID 45. Application Reference: 21/00737/SCR. Request for a screening opinion for a solar farm development on land at Sturton Road;
- h. ID 46. Application Reference: 22/00/358/FUL. Installation of a solar farm and battery storage facility with associated infrastructure at land east of Bumble Bee Farm, Saundby, Nottinghamshire;
- i. ID 54. Application Reference 22/008/31/SCR. Screening Opinion - Demolition of Power Station at West Burton Power Station;
- j. ID 55. Application Reference 22/01219/SCR. Screening Opinion - Demolition of Power Station at West Burton Power Station;
- k. ID 110. Application Reference: 145239. A multi-use development comprising 2046 residential units and various community facilities on Foxby Lane, Gainsborough; and
- l. ID 132. Application Reference: 136937. A residential development comprising 750 units at land north east of Highfields roundabout, Corringham.

18.10.6 The above projects have been reviewed for potential overlapping spatial and temporal interactions with the Scheme. Where there is the potential for overlapping interactions of effects on important ecological features to occur, the relevant important ecological features have been identified and where they are considered to be sensitive, the overlapping development taken forward for cumulative assessment. There is no potential for cumulative effects where the Scheme has a negligible effect, so this assessment only considers those reported as minor adverse effects or of greater significance.

18.10.7 The ecological baseline, along with an assessment of the Scheme's impacts on important ecological features, is presented in **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1].

18.10.8 As set out in **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1], there are no sites internationally designated for their biodiversity importance within 10km of the Order limits nor any for which bats are a qualifying feature within 30km of the Order limits. **Appendix 9-12: Habitat Regulations Assessment** of this ES [EN010142/APP/6.2] considers where the Cable Route Corridor crosses the River Trent, which is hydrologically connected to the Humber Estuary SAC and Ramsar Site (approximately 40km upstream of the Cable Route Corridor) and includes migratory fish as a qualifying feature. Both **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1] and **Appendix 9-12: Habitat Regulations Assessment of this ES [EN010142/APP/6.2]** conclude that

there are no significant effects on these sites resulting from the Scheme. As such, there are no significant effects from the Scheme to act in combination with other projects or plans.

Cumulative Effects During Construction

18.10.9 Chapter 9: Ecology and Nature Conservation of this ES

[EN010142/APP/6.1] identifies the following residual effects (excluding effects concluded as negligible) on important ecological features during construction:

- a. Temporary loss of habitat during construction within the Willingham to Fillingham Road Verges Local Wildlife Site (LWS) – **Minor adverse effect, which is not significant.**
- b. Temporary damage to veteran trees during construction – **Minor adverse effect, which is not significant.**
- c. Temporary loss of hedgerows during construction – **Minor adverse effect, which is not significant.**
- d. Permanent loss of arable farmland breeding habitat for Skylark during construction – **Minor adverse effect, which is not significant.**
- e. Permanent loss of arable farmland breeding habitat for Quail during construction – **Minor adverse effect, which is not significant.**

18.10.10 Aside from the solar DCOs, it is considered unlikely that the other developments listed at paragraphs 18.10.4 and 18.10.5, even if constructed simultaneously, would have potential to generate significant cumulative effects on the important ecological features identified above, due to the nature of those schemes and their spatial distribution. It is assumed that for all other developments, they would follow good industry practice in terms of the management of construction works and pollution and dust control, and that any construction related impacts would be mitigated on site to avoid residual effects on important ecological features, as set out in their respective applications (Ref. 18-13, Ref. 18-22, Ref. 18-15, Ref. 18-23, Ref. 18-24, Ref. 18-25, Ref. 18-26, Ref. 18-27, Ref. 18-28, Ref. 18-29), where these are available.

18.10.11 With regard to the solar DCOs, the following relevant residual effects reported by the projects are considered:

- a. Gate Burton Energy Park - Temporary loss of hedgerows during construction – **Minor adverse effect, which is not significant.**
- b. Gate Burton Energy Park - Permanent loss of arable farmland breeding habitat for Skylark during construction – **Minor adverse effect, which is not significant.**
- c. Cottam Solar Project – residual effects during construction on the following low sensitivity/importance ecological features:
 - i. Beneficial effects on Hedgerows and Trees within the Cable Route Corridor;
 - ii. Adverse effects on Ditches and Watercourses within the Cable Route Corridor;

- iii. Adverse effects on Harvest Mouse.
- d. In addition, identified as operational effects in the Cottam Solar Project submission, but considered in the construction phase assessment in **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1], the following residual effects (adverse and beneficial) are also reported. However, based on the criteria set out in **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1], none of these residual effects are considered to be significant due to the relative sensitivity of the features.
 - i. Beneficial effects on Hedgerows and Trees within the PV and BESS Sites (Medium sensitivity/importance);
 - ii. Beneficial effects on Grassland: Arable Field Margins and Floodplain Grazing Marsh (Medium sensitivity/importance);
 - iii. Beneficial effects on Ditches and Watercourses within the PV and BESS Sites (Low sensitivity/importance);
 - iv. Beneficial effects on Ponds (Low sensitivity/importance);
 - v. Beneficial effects on Bats (Medium sensitivity/importance);
 - vi. Beneficial effects on Otter and Water Vole (Low sensitivity/importance);
 - vii. Beneficial effects on Polecat and Hedgehog (Medium sensitivity/importance);
 - viii. Adverse effects on Harvest Mouse (Low sensitivity/importance);
 - ix. Beneficial effects on Brown Hare (Low sensitivity/importance);
 - x. Beneficial effects on Reptiles and Amphibians (Low sensitivity/importance);
 - xi. Adverse effects on Breeding Birds, including Skylark, Yellow Wagtail, Grey Partridge, Quail, (Low sensitivity/importance);
 - xii. Neutral to beneficial effects on Breeding Birds, including Lapwing and Curlew and other species (Low sensitivity/ importance);
 - xiii. Adverse effects on Overwintering Birds (Low sensitivity/importance);
 - xiv. Beneficial effects on Invertebrates (Low sensitivity/importance); and
 - xv. Beneficial effects on Badgers (Low sensitivity/importance).
- e. West Burton Solar Project reports residual effects during construction on the following low sensitivity/importance ecological features:
 - i. Beneficial effects on Hedgerows and Trees within the cable route corridor;
 - ii. Adverse effects on Ditches and Watercourses within the cable route corridor; and
 - iii. Adverse effects on Harvest Mouse.

- f. In addition, identified as operational effects in the West Burton Solar Project submission, but considered in the construction phase assessment in **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1], the following residual effects (adverse and beneficial) are also reported. However, based on the criteria set out in **Chapter 9: Ecology and Nature Conservation** of this ES [EN010142/APP/6.1], none of these residual adverse effects are considered to be significant due to the relative sensitivity of the features.
- i. Beneficial effect on Hedgerows and Trees within the PV and BESS Sites (Medium sensitivity/importance);
 - ii. Beneficial effect on Grassland: Arable Field Margins and Floodplain Grazing Marsh (Medium sensitivity/importance);
 - iii. Beneficial effect on Ditches and Watercourses within the PV and BESS Sites (Low sensitivity/importance);
 - iv. Beneficial effect on Ponds (Low sensitivity/importance);
 - v. Beneficial effect on Bats (Medium sensitivity/importance);
 - vi. Beneficial effect on Otter and Water Vole (Low sensitivity/importance);
 - vii. Beneficial effect on Polecat and Hedgehog (Medium sensitivity/importance);
 - viii. Adverse effect on Harvest Mouse (Low sensitivity/importance);
 - ix. Beneficial effect on Brown Hare (Low sensitivity/importance);
 - x. Beneficial effect on Reptiles and Amphibians (Low sensitivity/importance);
 - xi. Adverse effect on Breeding Birds: Skylark and Grey Partridge (Low sensitivity/importance);
 - xii. Neutral to beneficial effect on Breeding Birds, including Yellow Wagtail, Lapwing and Curlew and other species (Low sensitivity/importance);
 - xiii. Adverse effect on Overwintering Birds (Low sensitivity/importance);
 - xiv. Beneficial effect on Invertebrates (Low sensitivity/importance);
and
 - xv. Beneficial effect on Badgers (Low sensitivity/importance).

18.10.12 The other solar DCOs have made commitments to retain and protect the majority of boundary features and all other habitats of ecological value, including minimising hedgerow loss and intrusive crossing or culverting of ditches and watercourses, along with providing substantial areas of open, undeveloped land. With the embedded mitigation measures included by all the solar DCOs, it is concluded that there is no potential for elevation of the non-significant effects identified above to cumulatively generate significant effects on important ecological features.

18.10.13 Gate Burton Energy Park identified no significant cumulative effects on ecology. The Cottam and West Burton Solar Schemes identified the potential for significant cumulative effects on the following features:

- a. Moderate cumulative adverse effect to ground nesting birds (Skylark, Yellow Wagtail, Grey Partridge and Quail) at a local to district level.
- b. Cumulative adverse effect (magnitude undefined) to overwintering birds at a local scale.
- c. Moderate cumulative beneficial effect to reptiles and amphibians at a district level.

18.10.14 All four solar DCOs have embedded significant areas of undeveloped land within their respective Order limits, which will be managed to promote ground-nesting bird species and provide a winter food resource for wintering farmland birds. In consideration of the relative sensitivity/importance applied to the ground-nesting birds and overwintering birds (low/local/district) in the various assessments and the extensive areas of higher quality habitats (than the existing arable farmland) being delivered across the four solar DCOs, it is assessed that it is unlikely that this will generate an adverse effect beyond the local level and therefore, is **not significant**.

18.10.15 Given, the spatial separation of the PV and BESS areas and absence of overlapping features (outside the Cable Corridor Route), the isolated populations of reptiles and amphibians across all four solar DCOs will benefit from the habitat creations generated by the projects, which may in time improve connectivity and integrate isolated populations across the projects. However, given the low sensitivity/importance of the identified populations, it is unlikely that this will generate an effect beyond the local level and therefore, is **not significant**.

Cumulative Effects During Operation

18.10.16 The Scheme will deliver at least 10% biodiversity net gain (BNG), and once operational there will be extensive green infrastructure and ecological enhancements. It is also assumed that all other developments would follow good industry practice in terms of operational management and maintenance works, and that any operation related impacts would be mitigated on site to avoid residual effects on ecological features. No adverse operational effects on important ecological features have been reported for the Scheme. Habitat losses and habitat creation have been considered as construction impacts and the other solar DCOs do not report any further significant effects during operation. Therefore, **no cumulative effects** arise.

Cumulative Effects During Decommissioning

18.10.17 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction. Mitigation measures for managing ecological impacts during

decommissioning are documented within the **Framework DEMP [EN010142/APP/7.10]** and it is assumed that any nearby construction/decommissioning sites would manage their ecological impacts to a similar level of good practice in accordance with their own CEMPs/DEMPs. The cumulative effects on important ecological features during decommissioning would therefore **not be significant**.

18.11 Water Environment

Introduction

18.11.1 The Zol for Water Environment is 2km and is presented in **Figure 18-1** of this ES **[EN010142/APP/6.3]**. This Zol is in place to cover the cumulative effects on water resource receptors, including surface water and groundwater quality, and flood risk. In addition to the solar DCOs, which are noted below as ID 1, ID2 and ID 3 in the table below, the other cumulative developments within the Zol with potential to generate cumulative effects are set out in **Table 18-9**.

Table 18-9: Summary of cumulative developments within the Zol for Water Environment (in addition to the solar DCOs)

ID	Application Ref / Description	Watercourse catchment	Approximate distance to Scheme
Principal Site			
ID76	PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development.	Fillingham Beck	Surrounded by the Principal Site area, outside of Order limits.
ID79	PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure.	Black Dyke catchment (scoped out)	Approx. 250m to north-east, outside of Principal Site.
ID126	139890. County matter application PL-0130-19 for the erection of a gas transport filling station.	Black Dyke catchment (scoped out)	Approx. 800m to north-east outside of Principal Site.

Cable Route Corridor

ID	Application Ref / Description	Watercourse catchment	Approximate distance to Scheme
ID5	[EN020034] North Humber to High Marnham Energy Grid -New high voltage electricity transmission line	Closest catchment where works take place is Catchwater Drain (tributary of Trent)	Approx. 2km west of Cable Route Corridor. The surface water catchment drains into the River Trent approximately 7km downstream of this Scheme.
ID50	19/00167/SCR / Demolition of Cottam Power Station. Within catchment of Seymour Drain, crosses the Cable Route Corridor.	Seymour Drain	Within area of Cable Route Corridor.
ID174	147710 / Request for a scoping opinion for proposed solar farm development at Stow Park.	Skellingthorpe Main Drain	Approx.650m south of Cable Route Corridor.
ID2	Gate Burton Energy Park [EN010131]	River Trent / Seymour Drain	Cable Route Corridor follows same route to Cottam Power Station, non-intrusively crossing the River Trent at a similar location to the crossing for this Scheme.
ID1	Cottam Solar Project [EN010133]	River Till / Fillingham Beck / Marton Drain / Skellingthorpe Main Drain/ River Trent / Seymour Drain	Cable Route Corridor follows same route to Cottam Power Station. Some areas of Solar PV Panels 1.5 km to the south of the Principal Site. The cable route corridor crossing the River Trent at a similar location to the crossing for this Scheme.
ID3	West Burton Solar Project [EN010132]	Marton Drain / Skellingthorpe Main Drain/ River	Cable Route Corridor follows same route to cross the River Trent

ID	Application Ref / Description	Watercourse catchment	Approximate distance to Scheme
		Trent / Seymour Drain	at a similar location to the crossing for this Scheme.

Cumulative Effects During Construction

18.11.2 In addition to the solar DCOs, there are three applications for development within the water environment Zol for the Principal Site. The reasons for scoping in or out of further consideration for cumulative effects are listed below:

- a. ID79 and ID126: These are scoped out as they are located to the north-east of the Principal Site and are within a separate surface water catchment, and thus there is no hydrological pathway from the Scheme to the other developments; and
- b. ID76 relates to the Glentworth Oil proposed drilling site which is surrounded by the Order limits of the Principal Site, and is therefore scoped in to be considered for cumulative effects.

18.11.3 It is assumed that the cumulative schemes listed above and the nearby solar DCOs, will follow good industry practice during construction, such as management of construction works and surface water runoff (and risk to groundwater of minor chemical leaks from static and mobile equipment), as set out in their respective applications (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13). The DCO applications for Gate Burton Energy Park [EN010131], Cottam Solar Project [EN010133] and West Burton Solar Project [EN010132] include Outline, or Framework, Construction Environmental Management Plans which set out measures to protect the water environment. Glentworth Oil Planning Application sets out measures to protect the water environment within the Hydrogeological Risk Assessment and Flood Risk Assessment document (Envireau Water, December 2022).

18.11.4 The mitigation measures for the Scheme are documented within the **Framework CEMP [EN010142/APP/7.8]** and it is assumed that the other developments will operate to a similar level of good practice in accordance with their own CEMPs. The cumulative effects on the water environment during construction are therefore likely to be **neutral (not significant)**.

18.11.5 In addition to the solar DCOs, the Cable Route Corridor for the Scheme has three applications for cumulative developments within the water environment Zol. The reasons for scoping in or out of further consideration for cumulative effects are listed below:

- a. ID5 is for the construction of North Humber to High Marnham Energy Grid - New high voltage electricity transmission line. At its closest this is approximately 2km west of the westerly extent of this Scheme. The area of works at its closest is within Catchwater Drain catchment (tributary of Trent) Water Body. This catchment area drains into the River Trent circa 7km downstream of where this Scheme interacts with drainage to the River Trent. Therefore, due to the distance of the development from the

Cable Route Corridor, and the dilution available in the River Trent, this development is scoped out of further assessment.

- b. ID50 relates to the demolition of Cottam Power Station in the Seymour Drain catchment, and is scoped in to further assess the potential cumulative effects; and
- c. ID174 is the request of scoping opinion for the proposed solar farm development located approximately 650 m south of the Cable Route Corridor, and is scoped in to further assess the potential cumulative effects.

18.11.6 The Cable Route Corridor has been refined to align as closely as possible with the Cable Route Corridors of the solar DCOs in the area, in order to reduce the overall working area and potential impacts. In addition, it is considered that any temporary or permanent effects from these solar DCOs and the other identified developments would not lead to cumulative impacts with the Scheme on the basis that all cumulative developments would adopt standard good practice construction measures and appropriate Sustainable Drainage Systems (SuDS) or proprietary measures for longer term runoff (e.g. as set out in the respective Outline, or Framework, Construction Environmental Management Plans attached to the applications and the Glentworth Oil Planning Application Hydrogeological Risk Assessment and Flood Risk Assessment document. (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-22), where these are available). It is therefore considered that the cumulative effects during construction would be **neutral (not significant)**.

Cumulative Effects During Operation

18.11.7 It is assumed that all other developments, including the solar DCOs, will include an appropriate drainage design/strategy to manage and treat surface water runoff, as set out in their Outline, and Framework, Environmental Management Plans attached to the solar DCO applications, and the Glentworth Oil Planning Application Hydrogeological Risk Assessment and Flood Risk Assessment document which includes measures to protect the water environment during operation (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13). These ensure there is no increase in flood risk, as would be required by planning policy and the Lead Local Flood Authority. It is therefore considered that the cumulative effects during operation would be neutral (not significant).

Cumulative Effects During Decommissioning

18.11.8 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction.

18.11.9 Mitigation measures for managing impacts to surface water and groundwater during decommissioning are documented within the **Framework DEMP [EN010142/APP/7.10]** and it is assumed that any nearby construction/decommissioning sites would operate to a similar level of good

practice in accordance with their own CEMPs/DEMPs. The cumulative effects on the water environment during decommissioning would therefore be **neutral (not significant)**.

18.12 Human Health

18.12.1 The cumulative effects associated with human health are covered in the air quality; climate change; noise and vibration; socio-economics and land use; and transport and access sections of this chapter and not duplicated here.

18.13 Landscape and Visual Amenity

Introduction

18.13.1 The Zols for landscape and visual amenity are 10km and 2km and are illustrated in **Figure 18-1** of this ES [EN010142/APP/6.3]. There is a 10km Zol in place for effects on receptors around the Principal Site and a 2km Zol in place for effects on receptors along the Cable Route Corridor.

18.13.2 Cumulative landscape impacts can change either the physical fabric or character of the landscape, or any special values attached to it. For example:

- a. Cumulative impacts on the physical fabric of the landscape arise when two or more developments affect landscape components such as arable land, hedgerows, or perceptual qualities such as tranquillity.
- b. Cumulative impacts on landscape character arise when two or more developments introduce new features into the landscape. In this way, they can change the landscape character to such an extent that they create a different landscape character type.

18.13.3 Cumulative impacts on visual amenity can be caused by 'combined visibility' and/or 'sequential impacts':

- a. Combined visibility occurs where the observer is able to see two or more developments from one viewpoint, either in combination (where several developments are within the observer's arc of vision at the same time) or in succession (where the observer has to turn to see the various developments).
- b. Sequential impacts occur when the observer has to move to another viewpoint to see different developments, such as roads, railways or recreational routes including long-distance trails. The magnitude of sequential effects will be affected in part by speed of travel and distance between viewpoints.

18.13.4 In addition to the solar DCOs, the other developments within the 10km (Principal Site) and 2km (Cable Route Corridor) Zols with potential to generate cumulative effects are listed in **Table 18-10** and **Table 18-11** respectively. For each development, a reasoned statement is provided as to whether it is scoped in or out of the cumulative assessment.

18.13.5 For the solar DCOs, reference should be made to the cumulative Zones of Theoretical Visibility (ZTV) in **Figures 18-2, 18-3** and **18-4** of this ES [EN010142/APP/6.3]. As with the ZTV produced for the Scheme alone, it

should be noted that these do not reflect screening derived from hedgerows, which will significantly limit visibility and intervisibility within the lower-lying areas of the Till Vale.

18.13.6 Where a development is noted as being 'not assessed further due to intervening distance', this will be on account of:

- a. Limited landscape effects due to the application being located in a Landscape Character Area (LCA) that is sufficiently distant from the host LCA for the Scheme, such that direct effects will be restricted to that LCA only and there would not be any resulting increase in direct landscape effects within the same LCA in conjunction with the Scheme;
- b. Limited landscape effects due to there being no or very limited intervisibility between the LCA hosting the application and the LCA for the Scheme, such that indirect effects (e.g. through changes in key views, movement and tranquillity) will be reduced by distance and screening; and
- c. Limited visual effects due to there being no or very limited combined views within the direction of the viewpoint, due to intervening distance and screening from topography, built form and vegetation.

Table 18-10: Summary of Cumulative Developments (10km Principal Site's Zol only) (in addition to the solar DCOs)

ID	Application Ref / Description	Approx. distance to the Scheme	Consideration for Assessment
ID 4	Application Reference: EN010088. Construction of a gas fired power station (NSIP), known as 'West Burton C Power Station'	9 km (Principal Site) 5km (Cable Route Corridor)	Not assessed further due to intervening distance and lower sensitivities arising from baseline energy infrastructure at the West Burton site.
ID 45	Application Reference: 21/00737/SCR. Request for a screening opinion for a solar farm development on land at Sturton Road	10 km (Principal Site) 6 km (Cable Route Corridor)	Not assessed further due to intervening distance, located beyond high ground south of Gainsborough and the River Trent, west of Saundby; and where baseline sensitivity is reduced through existing energy infrastructure.
ID 46	Application Reference: 22/00/358/FUL. Installation of a	10 km (Principal Site)	As ID 45 above, located west of Bole.

ID	Application Ref / Description	Approx. distance to the Scheme	Consideration for Assessment
	Solar Farm and Battery Storage Facility with Associated Infrastructure on land east of Bumble Bee Farm	7 km (Cable Route Corridor)	
ID 54	Application Reference 22/008/31/SCR. Screening Opinion - Demolition of Power Station at West Burton Power Station	8 km (Principal Site) 5 km (Cable Route Corridor)	Not assessed further due to intervening distance and lower sensitivities arising from baseline energy infrastructure at the proposal site. It should be noted that the demolition of the coal-fired power station is also noted as part the future baseline in the LVIA (Chapter 12: Landscape and Visual Amenity of the ES [EN010142/APP/6.1]).
ID 55	Application Reference 22/01219/SCR. Screening Opinion - Demolition of Power Station at West Burton Power Station	8 km (Principal Site) 5 km (Cable Route Corridor)	As ID54 above.
ID 79	Application Reference: PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure	1 km (Principal Site) 5 km (Cable Route Corridor)	Not assessed further due to lower sensitivities associated with existing Hemswell Cliff industrial /commercial complex; lower sensitivities of receptors on A631; and limited intervisibility with Principal Site solar infrastructure.
ID 126	Application Reference 139890. County matter application PL-0130-19 for the erection of a gas transport filling station;	1 km (Principal Site) 5 km (Cable Route Corridor)	As ID 79 above.

ID	Application Ref / Description	Approx. distance to the Scheme	Consideration for Assessment
ID 110	Application Reference: 145239. A multi-use development comprising 2046 residential units and various community facilities on Foxby Lane, Gainsborough; and	5 km (Principal Site) 8 km (Cable Route Corridor)	Not assessed further due to lower sensitivities of existing urban fringe and A631, lack of intervisibility; and difference in development type (as an extension to Gainsborough).
ID 132	Application Reference: 136937. A residential development comprising 750 units at land northeast of Highfields roundabout, Corringham Road.	1 km (Principal Site) 4 km (Cable Route Corridor)	As ID110 above.

Table 18-11: Summary of Cumulative Developments (10km Principal Site's Zol and/ or 2km Cable Route Corridor's Zol) (in addition to the solar DCOs)

ID	Application Ref / Description	Approx. distance to the Scheme	Consideration for Assessment
ID 5	[EN020034] North Humber to High Marnham Energy Grid - New high voltage electricity transmission line	11km (Principal Site) 2.5 Cable Route Corridor)	Not assessed further due to intervening distance from Scheme, in particular relative to the more limited works associated with the Cable Route Corridor.
ID 50	Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of	12km (Principal Site) Within Cable	Not assessed further due to lower sensitivities arising from baseline energy infrastructure at the proposal site. It should be noted that the demolition of the coal-fired power station is also noted as part the future

ID	Application Ref / Description	Approx. distance to the Scheme	Consideration for Assessment
	Cottam Power Station; and	Route Corridor	baseline in the LVIA (refer to Chapter 12: Landscape and Visual Amenity of the ES [EN010142/APP/6.1]).
ID 76	Application Reference: 146100/PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development	Surrounded by the Order limits of the Principal Site 1.5km (Cable Route Corridor)	Assessed below on account of location being surrounded by the Order limits of the Principal Site.
ID 174	Application Reference 147710. Request for a scoping opinion for proposed solar farm development at Stow Park	7.5km (Principal Site) 0.2km (Cable Route Corridor)	Not assessed further due to intervening distance from Principal Site and limited intervisibility/perceptual changes expected in conjunction with Cable Route Corridor.

18.13.7 With respect to the solar DCOs, the assessment considers effects arising from both the Principal Site (each in turn, alongside all four DCOs combined) and the Cable Route Corridor. Those for the Cable Route Corridor are in relation to the two scenarios presented in above, whereby works are undertaken to a shared corridor for all four DCOs (including the Scheme), allowing the same access points, haul routes and compounds to be used; these will remain in place for the duration of the programme. Works will be undertaken over a 24- to 36-month period (Scenario 1) or a maximum 5-year period (Scenario 2).

18.13.8 It should be noted that the cumulative landscape and visual effects assessment presented here reflects the methodology outlined above and in **Table 18-6**. This assesses the effects of the Scheme with other solar DCOs

or cumulative schemes together in combination. This will result in a cumulative effect that is equal to or greater than the residual effect for the receptor, unless there is a demonstrable benefit in the cumulative effect, in which case it will be lower.

- 18.13.9 LVIA cumulative assessment typically references guidance published by NatureScot (Guidance – Assessing the cumulative landscape and visual impact of onshore wind energy developments) (Ref. 18-31). This approach distinguishes the contribution of each individual cumulative project to the overall assessment; and identifies the additional cumulative change which would be brought about by the proposed scheme.
- 18.13.10 For this assessment, where the cumulative effect is described as being of moderate significance for a receptor for which the effect in isolation is moderate; or where the cumulative effect is described as being of large significance for which the effect in isolation is major; the cumulative effect is considered to be the greater of the two, even though both are within broadly similar significance categories. Although the cumulative effect of the Scheme and one or more other developments on a receptor will invariably be greater than the effect in isolation, in such cases the increase in cumulative effect over and above that reported in isolation is not considered to justify a move into a higher significance category, as described in **Table 18-6**.
- 18.13.11 Similarly, where a cumulative project may be situated within the same landscape receptor or representative viewpoint for which a slight, moderate or major residual effect has been identified for the Scheme in isolation; and the contribution of this cumulative scheme is barely perceptible or extremely limited (e.g. a distant, small-scale element within a view, or no direct impacts from other projects for the same landscape character area), no significant cumulative effect is noted within this assessment. In such cases, the Scheme is the main contributor to the effects experienced by this receptor and these are not added to by the cumulative developments.

Landscape Character Cumulative Effects Assessment

- 18.13.12 **Table 18-12** to **Table 18-15** below provide an assessment of cumulative landscape effects at construction, Year 1 operation (winter), Year 15 operation (summer) and decommissioning stages for the solar DCOs and application ID 76 (Glentworth Oil Well), as noted in **Table 18-11** above. All other applications listed in **Table 18-10** and **Table 18-11** have been screened out of further assessments for the reasons stated above.
- 18.13.13 A cumulative assessment is provided for each Local Landscape Character Area (LLCA) for which a minor or greater effect is noted for each stage. Where a specific application is not noted, it is assumed that effects arising from this particular scheme will be neutral.
- 18.13.14 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of

decommissioning are likely to be similar to those or less than during construction.

Table 18-12: Landscape Assessment of Cumulative Schemes in Construction

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Cumulative Landscape Effect
LLCA 1a Hemswell Dip Slopes – Harpswell (Medium)	Minor adverse (Principal Site)	All schemes	No direct impacts. Solar DCOs: very limited indirect impacts through intervisibility (and perceptual influence) from due to landform of Lincoln Cliff and distance; and very limited increase in indirect perceptual change from construction traffic along low-sensitivity A631 (if used). ID 76 (Glentworth oil well): potential temporary increase in construction traffic (and perceptual influence) along Middle Street.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
LLCA 2b Lincoln Cliff – Harpswell (High)	Moderate adverse (Principal Site)	All schemes	No direct impacts. Potential indirect impacts through intervisibility (and perceptual influence) of energy infrastructure construction within open views, but largely limited by woodland screening.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
LLCA 2c Lincoln Cliff – Open Farmland (Medium)	Moderate adverse (Principal Site)	All schemes	No direct impacts. Solar DCOs: potential indirect impacts through intervisibility (perceptual influence) of energy infrastructure construction within views that are a key LLCA characteristic: locally extending the influence of solar infrastructure within these views (Cottam) albeit at greater distance from the Cliff relative to the Scheme; or very limited due to distance (Gate Burton); or localised,	Moderate adverse (significant) cumulative effect (i.e. the cumulative effect comprises moderate adverse effects from the Scheme and further effects from cumulative developments, however, the overall cumulative effect is

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Cumulative Landscape Effect
			<p>long-range and with a degree of spatial separation from the Scheme along the Cliff (West Burton). ID 76 (Glentworth oil well): potential indirect impacts through intervisibility (and perceptual influence) of energy infrastructure construction (e.g. drilling rig) in open views, but minor, distant element. Potential temporary increase in construction traffic along Middle Street.</p>	<p>assessed as moderate adverse (significant))</p>
<p>LLCA 3a Till Vale Open Farmland (Low)</p>	<p>Moderate adverse (Principal Site) Minor adverse (Cable Route Corridor)</p>	<p>All schemes</p>	<p>Solar DCOs: Direct impacts arising from construction of solar infrastructure to areas both north and south of the Scheme (or from the Scheme 'infilling' between), thereby extending influence of solar infrastructure construction along an overall north-south corridor of up to approximately 20 km within the LLCA and areas of corresponding character; and extending to the west to include Gate Burton. This would include wider indirect impacts such as perception of traffic in rural areas. Works in relation to the Cable Route Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period, although in both cases cumulative impacts will be limited by the shared use of compounds and haul roads.</p>	<p>Large adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Principal Site, minor adverse effects contributed by the Cable Route Corridor and effects from the cumulative developments, resulting in an overall large adverse (significant) cumulative effect)</p>

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Cumulative Landscape Effect
			<p>ID 76 (Glentworth oil well): direct impacts arising from construction of energy infrastructure and associated perceptual influences (including moving traffic along rural lanes) within Principal Site, although relatively limited in extent and short-term; and with local hydrocarbon extraction precedent.</p>	
<p>LLCA 3c Till Vale Villages (Medium)</p>	<p>Minor adverse (Cable Route Corridor)</p>	<p>Cottam Solar Project [EN010133]</p>	<p>No direct impacts from Principal Site (effect arising from Principal Site only assessed as negligible). Direct impacts arising from construction of the shared cable corridor with the Cottam Solar Project [EN010133] around Normanby by Stow; alongside indirect (perceptual) impacts from influence of construction and associated access or compounds within the LLCA and along rural roads. Works in relation to the Cable Route Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period, although in both cases cumulative impacts will be limited by the shared use of compounds and haul roads.</p>	<p>Slight adverse (not significant) (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is assessed as slight adverse (not significant))</p>
<p>LLCA 5a Trent Valley – Meadowlands (Medium)</p>	<p>Minor adverse (Cable Route Corridor)</p>	<p>Gate Burton Energy Park, Cottam</p>	<p>Direct impacts arising from construction of the cable corridor within the shared underground crossing of the River Trent and associated trenchless crossing works;</p>	<p>Moderate adverse (significant) cumulative effect</p>

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Cumulative Landscape Effect
		Solar Project, West Burton Solar Project	alongside indirect (perceptual) impacts from influence of construction and associated access or compounds within the LLCA along the river. Works in relation to the Cable Route Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period, although in both cases cumulative impacts will be limited by the shared use of compounds and haul roads.	(i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, resulting in an overall moderate adverse (significant) cumulative effect)

Table 18-13: Landscape Assessment of Cumulative Schemes in Operation (Year 1 Winter)

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
LLCA 2b Lincoln Cliff – Harpswell (High)	Moderate adverse (Principal Site)	All schemes	No direct impacts. Solar DCOs: potential indirect impacts through intervisibility (and perceptual influences) of other solar DCO schemes, but heavily limited by woodland and screening around Harpswell. ID 76 (Glentworth oil well): potential indirect impacts through intervisibility (and perceptual influence) of energy infrastructure in open views, although likely to be very limited where vertical elements e.g. drilling rigs are not expected to be present during the operational stage.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
LLCA 2c Lincoln Cliff – Open Farmland (Medium)	Minor adverse (Principal Site)	All schemes	No direct impacts. Solar DCOs: potential indirect impacts through intervisibility (perceptual influence) of energy infrastructure within views that are a key LLCA characteristic: locally extending the influence of solar infrastructure within these views (Cottam) albeit at greater distance from the Cliff relative to the Scheme; or very limited due to distance (Gate Burton); or localised, long-range and with a degree of spatial separation from the Scheme along the Cliff (West Burton). ID 76 (Glentworth oil well): potential indirect impacts through intervisibility (and perceptual	Slight adverse (not significant) (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is assessed as slight

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
LLCA 3a Till Vale Open Farmland (Low)	Moderate adverse (Principal Site) Minor adverse (Cable Route Corridor)	All schemes	<p>influence) of energy infrastructure in open views, although likely to be very limited where vertical elements e.g. drilling rigs are not expected to be present during the operational stage.</p> <p>Gate Burton Energy Park [EN010131]: direct impacts arising from presence of solar infrastructure to western periphery of LLCA but spatially separated by intervening, slightly elevated LLCA 3b which also limits intervisibility. West Burton Solar Project [EN010132]: direct impacts arising from presence of solar infrastructure to areas within Till Vale that are a southern continuation of LLCA 3a, but spatially separate and very little expected intervisibility. Cottam Solar Project [EN010133]: direct impacts arising from presence of solar infrastructure to areas both north and south of the Scheme (or from the Scheme ‘infilling’ between), thereby extending influence of solar infrastructure construction along an approximately 15 km north-south corridor within the LLCA and areas with corresponding character. For all three solar DCOs, direct impacts arising from presence of solar infrastructure to areas both north and south of the Scheme (or from the Scheme ‘infilling’ between), thereby extending</p>	<p>adverse (not significant))</p> <p>Large adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, resulting in an overall large adverse (significant) cumulative effect)</p>

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
LLCA 5a Trent Valley – Meadowlands (Medium)	Minor adverse (Cable Route Corridor)	All Solar DCO schemes	<p>presence of solar infrastructure as a feature and land use along an overall north-south corridor of up to approximately 20 km within the LLCA and areas of corresponding character; and extending to the west to include Gate Burton.</p> <p>ID 76 (Glentworth oil well): direct impacts arising from presence of energy infrastructure and localised indirect impacts from perceptual influences within Principal Site, although likely to be very limited where vertical elements e.g. drilling rigs are not expected to be present during the operational stage. Oil wells are present as baseline features.</p> <p>Impacts will arise primarily where vegetation loss (e.g. localised hedgerow removal) is not yet mature or cannot be reinstated for operational reasons. Due to the shared nature of the corridor, it is not anticipated that this will result in an appreciable increase in these direct impacts.</p>	<p>No significant cumulative effect</p> <p>(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)</p>

Table 18-14: Landscape Assessment of Cumulative Schemes in Operation (Year 15 Summer)

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
LLCA 2b Lincoln Cliff – Harpswell (High)	Minor adverse (Principal Site)	All schemes	No direct impacts. Solar DCOs: indirect (perceptual) impacts from influence of other solar infrastructure heavily limited by woodland screening around Harpswell. ID 76 (Glentworth oil well): indirect impacts through intervisibility (and perceptual influence) of energy infrastructure not expected to be appreciable, due to existing and proposed screening from woodland and hedgerows; and vertical elements (e.g. drilling rigs) not expected to be present during the operational stage.	Slight adverse (not significant) (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant).
LLCA 2c Lincoln Cliff – Open Farmland (Medium)	Minor adverse (Principal Site)	All schemes	No direct impacts. Gate Burton Energy Park [EN010131]: potential indirect impacts through intervisibility (and perceptual influence), but very limited due to localised, long-range views. West Burton Solar Project [EN010132]: indirect impacts through intervisibility (and perceptual influence) in publicised views that are a key LLCA characteristic; but generally localised, long-range and with a degree of spatial separation from the Scheme along the Cliff; or (Cottam solar DCO) locally extending the influence of solar infrastructure within these views. Low magnitude of change. All three	Slight adverse (not significant) (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant).

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
			<p>solar DCO schemes: locally extending the influence of solar construction within views that are a key LLCA characteristic: minimum distances of Cottam (2 to 2.5 km) and West Burton (3 km) from areas of open land along Lincoln Cliff result in more limited influence than Scheme with increasing distance. ID 76 (Glentworth oil well): potential indirect impacts through intervisibility (and perceptual influence) of energy infrastructure in open views, although likely to be very limited where vertical elements e.g. drilling rigs are not expected to be present during the operational stage. Low magnitude of change (worst-case).</p>	
<p>LLCA 3a Till Vale Open Farmland (Low)</p>	<p>Moderate adverse (Principal Site) Minor adverse (Cable Route Corridor)</p>	<p>All schemes</p>	<p>Gate Burton Energy Park [EN010131]: direct impacts arising from presence of solar infrastructure to western periphery of LLCA but spatially separated by intervening, slightly elevated LLCA 3b which also limits intervisibility. West Burton Solar Project [EN010132]: direct impacts arising from presence of solar infrastructure to areas within Till Vale that are a southern continuation of LLCA 3a, but spatially separate and very little expected intervisibility. Cottam Solar Project [EN010133]: direct impacts arising from presence of solar infrastructure to areas</p>	<p>Large adverse (significant) cumulative effect</p>

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
			<p>both north and south of the Scheme (or from the Scheme ‘infilling’ between) thereby, extending influence of solar infrastructure construction along an approximately 15 km north-south corridor within the LLCA and areas with corresponding character. All three solar DCO schemes: as above for Cottam Solar Project [EN010133], but also extending to the west to include Gate Burton. Significant adverse effects arising from the presence of more extensive solar infrastructure should, however, be considered in the context of long-term green infrastructure benefits. ID 76 (Glentworth oil well): direct impacts arising from presence of energy infrastructure and localised perceptual influences within Principal Site, although likely to be very limited where vertical elements e.g. drilling rigs are not expected to be present during the operational stage. Oil wells are present as baseline features.</p>	

Table 18-15: Landscape Assessment of Cumulative Schemes at Decommissioning (winter)

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
LLCA 2b Lincoln Cliff – Open Farmland (Medium)	Minor adverse (Principal Site)	All schemes	No direct impacts. All schemes: indirect impacts through intervisibility (and perceptual influence) in publicised views that are a key LLCA characteristic; and locally extending the influence of solar decommissioning of energy infrastructure and a return to largely agricultural land use within these views, but with limited intervisibility due to the maturity of vegetation associated with the solar DCOs.	Slight adverse (not significant) (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant).
LLCA 3a Till Vale Open Farmland (Low)	Moderate adverse (Principal Site) Minor adverse (Cable Route Corridor)	All schemes	Solar DCOs: direct impacts arising from decommissioning of solar infrastructure to areas both north and south of the Scheme (or from the Scheme ‘infilling’ between), thereby extending influence of associated activities and a return to largely agricultural land use along an overall north-south corridor of up to approximately 20 km within the LLCA and areas of corresponding character; and extending to the west to include Gate Burton. This would include wider indirect	Moderate adverse (significant) cumulative effect

LLCA and sensitivity	Residual Landscape Effect	ID and name	Cumulative Landscape Assessment	Additional Cumulative Landscape Effect
			<p>impacts such as perception of traffic in rural areas. ID 76 (Glentworth oil well): direct impacts arising from decommissioning associated perceptual influences (including moving traffic along rural lanes) within Principal Site, but likely to be very limited in scale for this stage. Perceptual impacts will be limited due to the maturity of vegetation associated with the solar DCOs.</p>	<p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant)</p>

Visual Amenity Cumulative Effects Assessment

18.13.15 **Table 18-16** to **Table 18-18** below provide an assessment of cumulative visual effects at construction, Year 1 operation (winter) and Year 15 operation (summer) stages for the solar DCOs and application ID 76 (Glentworth oil well) in **Table 18-10** and **Table 18-11** above.

18.13.16 A cumulative assessment is considered for representative viewpoints where a minor or greater effect is noted for the Scheme in isolation, at each stage. However, where no visibility is expected of any other applications due to intervening vegetation and/or topography; and/or combined with distance; it is assumed that there will be no change in the significance of effect for a viewpoint when compared to the scheme in isolation; and such viewpoints are not listed. Similarly, if no visibility is expected for a particular application, such applications are not noted; only applications where potential visibility is expected are described.

18.13.17 Reference should be made to the indicative extents of cumulative schemes, based on information provided by developers, shown on the photomontages in **Figure 12-14** of this ES [EN010142/APP/6.3].

18.13.18 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction.

18.13.19 Assumptions made for the visual assessment include:

- a. The assessment considers developments theoretically visible within the main body of the view ~~only. Consideration, although where appreciable visibility of potential combined views is provided at other schemes may arise in the endwider field of this section-view (e.g. as views in succession), these have been noted. ...~~
- b. Where a specific application or other solar DCO is not noted, it is assumed that no visibility is available with the extent of the viewpoints shown.
- c. For ID 76 (Glentworth oil well), it is assumed that visual effects will arise primarily during the construction stage, due to the expected requirement for a drilling rig (potentially up to around 50 m height) for temporary periods. For the operational stages, it is assumed that on-site infrastructure will be of a lower profile and similar to those of other hydrocarbon extraction sites within the wider area.

18.13.20 Consideration of potential sequential cumulative views is provided at the end of this section.

Table 18-16: Visual Assessment of Cumulative Schemes in Construction

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP2b Common Lane east of Harpswell (view west) (Medium)	Major adverse	ID 76 (Glentworth oil well):	Theoretical visibility of drilling rig (if required) at approximately 1.5km distance, but likely to be partly screened by topography and a temporary, short-term feature.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP4 Middle Street above Harpswell (Medium)	Moderate adverse	All schemes	Cottam Solar Project [EN010133]: construction (including progressive appearance of solar panels, earth moving and vehicles) will extend influence of such activities to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 2.7 km (south-west of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be at a minimum distance of approximately 5.7 km and less likely to be perceptible with the naked eye. The majority of views will be from fast-moving vehicles, although the southern parcels will	Moderate adverse (significant) cumulative effect (i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant))

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			<p>be in a more direct line of sight of travellers moving north to south. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is likely to be difficult to perceive with the naked eye. West Burton Solar Project [EN010132]: unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11 km), and intervening vegetation. All three solar DCOs: as noted above, Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative effects. ID 76 (Glentworth oil well: theoretical visibility of drilling rig (if required) at approximately 2.5km distance, but likely to be a very minor element within expansive view and a temporary, short-term feature. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u></p>	
VP5 Kexby Road, west of Glentworth (High)	Minor adverse	ID 76 (Glentworth oil well)	Theoretical visibility of drilling rig (if required) at approximately 2.5 km distance, but likely to be partly screened by trees and bunds associated with the	No significant cumulative effect (i.e. the Scheme is the main contributor to the

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			agricultural reservoirs and a short-term feature.	effects experienced by this receptor, and these are not added to by the cumulative developments)
VP7 B1398 Middle Street, Glentworth Cliff Farm (High)	Moderate adverse	All schemes	<p>Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye.</p> <p>West Burton Solar Project [EN010132]: unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11 km), and intervening vegetation.</p> <p>Cottam Solar Project [EN010133]: Construction (including progressive appearance of solar panels, earth moving and vehicles) will extend influence of such activities to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 2 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be at a minimum distance of approximately 7.3 km and not likely to be perceptible due to distance and vegetation screening. All</p>	<p>Moderate adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant))</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP8 B1398 Middle Street above Fillingham (High)	Moderate <u>Minor</u> adverse	All schemes	<p>three solar DCOs: Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative visual effects. ID 76 (Glentworth oil well): Theoretical visibility of drilling rig (if required) at approximately 3 km distance, but likely to be a very minor element within expansive view and a temporary, short-term feature.</p> <p><u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u></p>	<p>No <u>Slight</u> adverse (not significant) cumulative effect</p> <p>(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative effect <u>comprises minor adverse effects contributed by the Scheme and further effects from cumulative</u></p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			<p>Cottam Solar Project to the south, but the cumulative effect is worst-case. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 8 km), and intervening vegetation. All three solar DCOs: Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative visual effects. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u></p>	<p>developments), <u>however, the overall cumulative effect is still assessed as slight adverse (not significant).</u></p>
<p>VP9 Kexby Road, west of Glentworth Grange (High)</p>	<p>Major adverse</p>	<p>ID 76 (Glentworth oil well), <u>Cottam Solar Project [EN010133]</u></p>	<p>Construction, <u>Within the field of view illustrated, construction—in relation to ID 76—including a drilling rig (if required) will be prominent within the view, viewed on rising ground at a minimum of approximately 750 m distance and in the context of the more expansive construction associated with the Scheme. Works (in particular the drilling rig) will largely be a temporary, short-term feature. <u>Cottam</u></u></p>	<p>Large adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises major adverse effects contributed by the Scheme and further effects from cumulative</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			<p><u>Solar Project [EN010133]: construction (including progressive appearance of solar panels, earth moving and vehicles) visible but at distance (approximately 650 m at closest point) and towards the south-east, approximately 150° from the orientation of the view, i.e. viewed in succession. Sequential views will be available in relation to the bridleway (Gltw/85/1) to the south and 180° from the orientation of the view shown; these are described in paragraphs 18.13.21 to 18.13.28 of this chapter.</u></p>	<p>developments, however, the overall cumulative effect is still assessed as large adverse (significant))</p>
<p>VP13 Public footpath (Hems/787/2) on Lincoln Cliff, Hemswell (Millfield) (High)</p>	<p>Major adverse</p>	<p>All schemes</p>	<p>Cottam Solar Project [EN010133]: construction (including progressive appearance of solar panels, earth moving and vehicles) will extend the influence of such activities to the south of the Scheme (or from the Scheme extending the influence northwards), although the southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 3.6 km (southwest of Glentworth). The northern parcels will be more distant (minimum approximately 4.6 km) although with more limited intervening vegetation. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at</p>	<p>Large adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises major adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as large adverse (significant))</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11.5 km), and intervening vegetation. All three solar DCOs: Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative visual effects.	
VP19 Grange Cottages, School Lane , Springthorpe (Medium)	Major adverse	Cottam Solar Project [EN010133]	Theoretical visibility of construction beyond the A631 at a minimum of approximately 1.1 km distance, but in the context of moving traffic intervening low hedgerows and partly screened by trees west of Yawthorpe.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP20 A631 East of Corringham windmill (Low)	Moderate Adverse	Cottam Solar Project [EN010133]	Theoretical visibility of construction at a minimum of approximately 600 m distance, but views are largely expected to be available only through a gap in the hedge from this location. Taller construction	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			elements (e.g. plant) may locally be visible over hedges.	this receptor, and these are not added to by the cumulative developments)
VP21 Corringham village hall (High)	Minor Adverse	Cottam Solar Project [EN010133]	Theoretical visibility of construction at minimum of between approximately 900 m and 1.1 km distance, but views expected to be largely of taller elements (e.g. plant) where visible above intervening hedges.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP24 Middle Street above Glentworth Hall (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Construction (including progressive appearance of solar panels, earth moving and vehicles) will theoretically be visible and extend influence of such activities to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to a high level of screening by mature trees within and around Glentworth and located at a minimum distance of approximately 2.2 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be screened by trees on	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			Coachroad Hill. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u>	
VP26 Bridleway (Gltw/85/1) N of Willingham Road (High)	Minor Adverse	ID 76 (Glentworth oil well) and Cottam Solar Project	Theoretical visibility of the drilling rig (if required) at approximately 1.3 km distance, but likely to be partly screened by trees and bunds associated with the agricultural reservoirs and a short-term feature. Sequential views will be available of Cottam Solar Project [EN010133] along the bridleway; these are described in paragraphs 18.13.21 to 18.13.28 of this chapter.	Slight adverse (not significant) cumulative effect (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant))
VP27 Bridleway (Fill/85/2), Willingham Road (High)	Minor Adverse	Cottam Solar Project [EN010133]	Construction (including progressive appearance of solar panels, earth moving and vehicles) will be visible to two separate parcels of land to the northeast (minimum distance approximately 800 m) and northwest (minimum distance approximately 900 m). The latter will be in conjunction with the more distant construction of the Scheme. Sequential views will be available of Cottam Solar	No Slight adverse (not significant) cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative effect)

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			Project [EN010133] along the bridleway; these are described in paragraphs 18.13.21 to 18.13.28 of this chapter.	<u>comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments</u>), however, the overall cumulative effect is still assessed as slight adverse (not significant))
<u>VP28 Yawthorpe (High)</u>	<u>Moderate Adverse</u>	<u>Cottam Solar Project [EN010133]</u>	<u>No views of other schemes expected within the field of view illustrated. Construction (including progressive appearance of solar panels, earth moving and vehicles) will be visible northwest (minimum distance approximately 750 m), outside this field of view, over 90° (i.e. successive views) from those of the Scheme. These will be at distance and not in the primary views of residential receptors, which face south-south-east.</u>	<u>No significant cumulative effect</u> <u>(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)</u>
VP29 Common Lane W of Billyards Farm (Low)	Moderate Adverse	ID 76 (Glentworth oil well)	Construction, predominantly a drilling rig (if required) will be visible within the view, and in the immediate context of the more expansive construction associated with the Scheme, but at approximately 1.3 km distance. Works (in particular the drilling	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			rig) will largely be a temporary, short-term feature.	this receptor, and these are not added to by the cumulative developments)
VP CRC1 Glentworth Road Gypsey Lane (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Works to the Cable Route Corridor include access from Glentworth Road in the foreground, with an increase in vehicle movement along the rural lane from Kexby. Works in relation to the Cable Route Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period, although in both cases cumulative impacts will be limited by the shared use of compounds and haul roads.	Slight adverse (not significant) cumulative effect (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant))
VP CRC2 Fillingham Lane - Moor House (entrance to Chestnut Manor) (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Construction of solar infrastructure may theoretically be glimpsed at the far end of Fillingham Lane (approximately 600 m distant), although works along the Cable Route Corridor are for the Cottam Solar Project are likely to be largely screened by intervening vegetation. There will be an increase in construction traffic along the rural lanes in relation to the Cable Route	Slight adverse (not significant) cumulative effect (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			Corridor: for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period.	effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant))
VP CRC3 Flat Tops, Normanby by Stow (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Construction of solar infrastructure may theoretically be visible within fields to the northeast (approximately 400 m distant) but with localised screening from hedgerows. Works in relation to the Cable Route Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period. In both cases cumulative impacts will be limited by the shared use of compounds and haul roads, but such features will occupy the foreground of this view.	Moderate adverse (significant) cumulative effect (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, <u>such that</u> the overall cumulative effect is assessed as moderate adverse (significant))
VP CRC4 Wooden Lane, S of Marton Road, Stow (Bridleway Stow/70/1) (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Construction of solar infrastructure will be visible in the foreground and to the right of the view to the east beyond Normanby by Stow, but at approximately 1.4 km distance this is likely to be limited by distance and localised screening from hedgerows. Works in relation to the Cable Route	Slight adverse (not significant) cumulative effect (i.e. the cumulative effect comprises minor adverse effects

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period.	contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant))
VP CRC5 Marton - Poplar Farm (Footpath Mton/68/1) (Medium)	Minor Adverse	All solar DCO schemes	Construction of solar infrastructure for the West Burton Solar Project [EN010132]: will be visible within the right (south) of the field in the foreground, with works associated with the Cable Route Corridor for the West Burton Solar Project and Gate Burton Energy Park [EN010131] in the remainder of the field, including the compound for the Scheme. In both cases cumulative impacts arising from the Cable Route Corridor will be limited by the shared use of compounds and haul roads, but such features will occupy the foreground of this view.	Moderate adverse (significant) cumulative effect (i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, <u>such that</u> the overall cumulative effect is assessed as moderate adverse (significant))
VP CRC6 Footpath (Bram/66/1), South of Trent Port, Marton (Medium)	Moderate Adverse	All solar DCO schemes	No construction of solar infrastructure will be visible from this viewpoint. However, works associated with the Cable Route Corridor for the three solar DCO schemes including compounds, haul roads and	Moderate adverse (significant) cumulative effect

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP CRC7 Trent Valley Way, Cottam (Cottam FP1) (Medium)	Moderate Adverse	All solar DCO schemes	<p>facilities for trenchless crossing under the River Trent, will be prominent within the view. Those in relation to Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period. In both cases cumulative impacts will be limited by the shared use of compounds and haul roads, but such features will occupy the foreground of this view. In addition, the well-used footpath may require closure for longer periods.</p> <p>No construction of solar infrastructure will be visible from this viewpoint. However, works associated with the Cable Route Corridor for the three solar DCO schemes including compounds, haul roads and facilities for trenchless crossing under the River Trent, will be prominent within the view. Those in relation to Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period. In both cases cumulative impacts will be limited by the shared use of compounds and haul roads, but such features will occupy the foreground of this view. In addition, the riverside footpath</p>	<p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant))</p> <p>Moderate adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant))</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			(Trent Valley Way) may require closure for longer periods.	
VP CRC8 Broad Lane/Cow Pasture Lane junction (South Leverton BOAT16) (Medium)	Minor Adverse	All solar DCO schemes	No construction of solar infrastructure will be visible from this viewpoint. Works in relation to the Cable Route Corridor for Scenario 1 will be over a similar worst-case timescale as the Scheme, but more intensive; whilst those for Scenario 2 will be sequentially over a longer period.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)

Table 18-17: Visual Assessment of Cumulative Schemes in Operation (Year 1, Winter)

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP4 Middle Street above Harpswell (Medium)	Moderate adverse	All assessed schemes	<p>Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 2.7 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be at a minimum distance of approximately 5.7 km and less likely to be perceptible with the naked eye. The majority of views will be from fast-moving vehicles, although the southern parcels will be in a more direct line of sight of travellers moving north to south. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is likely to be difficult to perceive with the naked eye. West Burton Solar Project [EN010132]: Unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11 km), and intervening vegetation. All three solar DCOs: Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative effects. ID 76 (Glentworth oil well): any operational infrastructure at 2.5km distance is likely to be barely perceptible within an expansive view. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u></p>	<p>Moderate adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant)).</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP7 B1398 Middle Street, Glentworth Cliff Farm (High)	Moderate adverse	All assessed schemes	Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 2 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be at a minimum distance of approximately 7.3 km and not likely to be perceptible due to distance and vegetation screening. Gate Burton Energy Park [EN010131]: Theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: Unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11 km), and intervening vegetation. ID 76 (Glentworth oil well): any operational infrastructure at 3 km distance is likely to be barely perceptible within an expansive view. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes, in particular viewpoints 4 and 8.</u>	Moderate adverse (significant) cumulative effect (i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant)).
VP8 B1398 Middle Street above Fillingham (High)	Moderate adverse	All solar DCO schemes	Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although the southern parcels will be subject to localised screening by vegetation (particularly mature trees in Fillingham) and at a minimum distance of approximately 2 km (west of Fillingham). Visibility of the	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			<p>Scheme is very limited, and screening provides a degree of separation from potentially more extensive views of Cottam Solar Project to the south. Gate Burton Energy Park [EN010131]: Theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: Unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 8 km), and intervening vegetation. All three solar DCOs: As noted above, Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative visual effects.</p>	<p>are not added to by the cumulative developments)</p>
<p>VP9 Kexby Road, west of Glentworth Grange (High)</p>	<p>Major adverse</p>	<p>ID 76 (Glentworth oil well), <u>Cottam Solar Project [EN010133]</u></p>	<p><u>As Within the field of view shown, ID76—as a worst case, during construction (including a drill rig)—will be visible on rising ground at a minimum of approximately 750 m distance and in the context of the more solar infrastructure of the Scheme and where mitigation planting is not yet established; although these elements will be temporary. Operational elements of this scheme are not expected to be so prominent but would be longer-term. <u>Cottam Solar Project [EN010133]: operational panels will be visible but at distance (approximately 650 m at the closest point) and towards the south-east, approximately 150° away from the orientation of the view, i.e. viewed in succession. Sequential views will be available in relation to the bridleway (Gltw/85/1) to the south and 180° from the</u></u></p>	<p>Large adverse (significant) cumulative effect</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			<p><u>orientation of the view shown; these are described in paragraphs 18.13.21 to 18.13.28 of this chapter.</u></p>	
<p>VP13 Public footpath (Hems/787/2) on Lincoln Cliff, Hemswell (Millfield) (High)</p>	<p>Major adverse</p>	<p>All schemes</p>	<p>Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the presence northwards), although the southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 3.6 km (southwest of Glentworth). The northern parcels will be more distant (minimum approximately 4.6 km) although with more limited intervening vegetation. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: Unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11.5 km), and intervening vegetation. All three Solar DCOs: Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative visual effects. ID 76 (Glentworth oil well): any operational infrastructure at 3 km distance is likely to be barely perceptible within an expansive view.</p>	<p>Large adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises major adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as large adverse (significant)).</p>
<p>VP19 Grange Cottages, School Lane, Springthorpe (Medium)</p>	<p>Major adverse</p>	<p>Cottam Solar Project [EN010133]</p>	<p>Theoretical visibility of operational panels beyond the A631 at a minimum of approximately 1.1 km distance, but in the context of moving traffic intervening low hedgerows and partly screened by trees west of Yawthorpe.</p>	<p>No significant cumulative effect</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
				(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP20 A631 East of Corringham windmill (Low)	Moderate Adverse	Cottam Solar Project [EN010133]	Theoretical visibility of operational panels at a minimum of approximately 600 m distance, but views are largely expected to be available only through a gap in the hedge from this location.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP21 Corringham village hall (High)	Minor Adverse	Cottam Solar Project [EN010133]	Theoretical visibility of operational panels at a minimum of between approximately 900 m and 1.1 km distance, but views expected to be largely limited by intervening hedges.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP24 Middle Street above Glentworth Hall (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Operational panels will theoretically be visible and extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to a high level of screening by mature trees within and around Glentworth and located at a minimum distance of approximately 2.2 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be screened by trees on Coachroad Hill. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u>	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP26 Bridleway (Gltw/85/1) N of Willingham Road (High)	Minor Adverse	All assessed schemes	No visibility in the direction of this viewpoint due to intervening screening by vegetation and topography. Sequential views will be available of Cottam Solar Project [EN010133] along the bridleway; these are described in paragraphs 18.13.21 to 18.13.28 of this chapter.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP27 Bridleway (Fill/85/2), Willingham Road (High)	Minor Adverse	Cottam Solar Project [EN010133]	Operational panels will be visible to two separate parcels of land to the northeast (minimum distance approximately 800 m) and northwest (minimum distance approximately 900 m). The latter will be in conjunction with the more distant infrastructure of the Scheme. Sequential views will be available of Cottam Solar Project [EN010133] along the	Slight adverse (not significant) cumulative effect (i.e. the cumulative effect comprises minor

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			bridleway; these are described in paragraphs 18.13.21 to 18.13.28 of this chapter.	adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as slight adverse (not significant)).
<u>VP28 Yawthorpe (High)</u>	<u>Moderate Adverse</u>	<u>Cottam Solar Project [EN010133]</u>	<u>No views of other schemes expected within the field of view illustrated. Construction (including progressive appearance of solar panels, earth moving and vehicles) will be visible northwest (minimum distance approximately 750 m), outside this field of view, over 90° (i.e. successive views) from those of the Scheme. These will be at distance and not in the primary views of residential receptors, which face south-south-east.</u>	<u>No significant cumulative effect</u> <u>(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)</u>
VP29 Common Lane W of Billyards Farm (Low)	Moderate Adverse	ID 76 (Glentworth oil well)	Any operational infrastructure at 1.3 km distance is likely to be screened by panels in the foreground.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
				cumulative developments)
VP CRC2 Fillingham Lane - Moor House (entrance to Chestnut Manor) (Medium)	Minor Adverse	Cottam Solar Project [EN010133]	Operational panels may theoretically be glimpsed at the far end of Fillingham Lane (approximately 600 m distant). However, in relation to the visual change arising from the Scheme at this point, which is likely to only arise from minor alterations to vegetation, cumulative impacts will be very limited.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP CRC5 Marton - Poplar Farm (Footpath Mton/68/1) (Medium)	Minor Adverse	All solar DCO schemes	Operational solar infrastructure for the West Burton Solar Project [EN010132] will be visible within the right (south) of the field in the foreground. However, in relation to the visual change arising from scenarios 1 and 2 for the Cable Route Corridor, no appreciable cumulative change beyond those identified for the Scheme in isolation is expected, given that the shared corridor and working methods will limit any additional works.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP CRC6 Footpath (Bram/66/1), South of Trent Port, Marton (Medium)	Minor Adverse	All solar DCO schemes	Effects arising from the Scheme relate to minor alterations in vegetation. It is not anticipated that Scenarios 1 or 2 for the Cable Route Corridor will result in any appreciable	No significant cumulative effect

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			cumulative change, given the shared corridor and working methods will limit any additional works.	(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP CRC7 Trent Valley Way, Cottam (Cottam FP1) (Medium)	Minor Adverse	All solar DCO schemes	Effects arising from the Scheme relate to minor alterations in vegetation. It is not anticipated that Scenarios 1 or 2 for the Cable Route Corridor will result in any appreciable cumulative change, given the shared corridor and working methods will limit any additional works.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)

Table 18-18: Visual Assessment of Cumulative Schemes in Operation (Year 15, Summer)

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP4 Middle Street above Harpswell (Medium)	Minor adverse	All assessed schemes	<p>Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels (at approximately 2.7 km distance) will be subject to screening along Middle Street such that views are only glimpsed and generally from vehicles travelling at speed. localised screening by vegetation and at a minimum distance of approximately 2.7 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be at a minimum distance of approximately 5.7 km and less likely to be perceptible with the naked eye. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is likely to be difficult to perceive with the naked eye and will be subject to screening along Middle Street. West Burton Solar Project [EN010132]: unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11 km), and intervening vegetation, including screening along Middle Street. ID 76 (Glentworth oil well): any operational infrastructure at 2.5km distance is likely to be</p>	<p>Slight adverse (not significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments, <u>however</u> the overall cumulative effect is <u>still</u> assessed as <u>moderate</u> <u>slight</u> adverse (<u>not</u> significant)).</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP7 B1398 Middle Street, Glentworth Cliff Farm (High)	Moderate adverse	All assessed schemes	<p>barely perceptible within an expansive view and subject to screening along Middle Street. <u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u></p> <p>Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although these southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 2 km (southwest of Glentworth). The northern parcels of solar infrastructure (east of Corringham) will be at a minimum distance of approximately 7.3 km and not likely to be perceptible due to distance and vegetation screening. Gate Burton Energy Park [EN010131]: Theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: Unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 11 km), and intervening vegetation. ID 76 (Glentworth oil well): any operational infrastructure at 3 km distance is likely to be barely perceptible within an expansive view.</p>	<p>Moderate adverse (significant) cumulative effect</p> <p>(i.e. the cumulative effect comprises moderate adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is still assessed as moderate adverse (significant)).</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP8 B1398 Middle Street above Fillingham (High)	Minor adverse	All assessed schemes	<p><u>Receptors travelling along Middle Street may receive sequential views of other Solar DCO schemes.</u></p> <p>Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the influence northwards), although the southern parcels will be subject to localised screening by vegetation (particularly mature trees in Fillingham) and at a minimum distance of approximately 2 km (west of Fillingham). Visibility of the Scheme is extremely limited due to screening by mature trees, such that cumulative visual effects are expected to be barely perceptible. Gate Burton Energy Park [EN010131]: theoretical visibility on distant rising ground, but at approximately 11 km it is not likely to be perceptible to the naked eye. West Burton Solar Project [EN010132]: unlikely to be perceptible to the naked eye due to low-lying nature of site, intervening distance (minimum approximately 8 km), and intervening vegetation. All three solar DCOs: Cottam will be the largest contributor to cumulative visual effects, but the other two DCO schemes are not expected to result in an appreciable increase in cumulative visual effects. <u>Receptors travelling along Middle</u></p>	<p>No significant cumulative effect</p> <p>(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)</p>

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			<u>Street may receive sequential views of other Solar DCO schemes.</u>	
VP9 Kexby Road, west of Glentworth Grange (High)	Moderate adverse	ID 76 (Glentworth oil well)), <u>Cottam Solar Project [EN010133]</u>	Operational works will be screened by the mitigation tree planting, <u>hedgerows and hedgerow enhancement</u> associated with the Scheme.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP13 Public footpath (Hems/787/2) on Lincoln Cliff, Hemswell (Millfield) (High)	Major adverse	All assessed schemes	Cottam Solar Project [EN010133]: operational panels will extend the presence of solar infrastructure to the south of the Scheme (or from the Scheme extending the presence northwards), although the southern parcels will be subject to localised screening by vegetation and at a minimum distance of approximately 3.6 km (southwest of Glentworth). The northern parcels will be more distant (minimum approximately 4.6 km) although with more limited intervening vegetation. Mitigation planting will be mature, but from this elevation and as a worst-case will not result in an appreciable reduction in visibility. Gate Burton Energy Park	Large adverse (significant) cumulative effect (i.e. the cumulative effect comprises major adverse effects contributed by the Scheme and further effects from cumulative developments, however, the overall cumulative effect is

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP19 Grange Cottages, School Lane, Springthorpe (Medium)	Minor adverse	Cottam Solar Project [EN010133]	Theoretical visibility of operational panels beyond the A631 at a minimum of approximately 1.1 km distance, but in the context of moving traffic intervening low hedgerows and partly screened by trees west of Yawthorpe.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
VP20 A631 East of Corringham windmill (Low)	Minor Adverse	Cottam Solar Project [EN010133]	Theoretical visibility of operational panels at a minimum of approximately 600 m distance, but views are largely expected to be available only through a gap in the hedge from this location.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP21 Corringham village hall (High)	Minor Adverse	Cottam Solar Project [EN010133]	Theoretical visibility of operational panels at a minimum of between approximately 900 m and 1.1 km distance, but views expected to be largely limited by intervening hedges.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative developments)
VP26 Bridleway (GltwFill/85/1) N of Willingham Road (High)	Minor Adverse	All assessed schemes	No visibility in the direction of this viewpoint due to intervening screening by vegetation and topography. Sequential views will be available of Cottam Solar Project [EN010133] along the bridleway <u>to Viewpoint 9, subject to establishment of screening</u> ; these are	No Slight adverse (not significant) cumulative effect

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
			described in paragraphs 18.13.21 to 18.13.28 of this chapter.	(i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by the cumulative effect <u>comprises minor adverse effects contributed by the Scheme and further effects from cumulative developments</u>); <u>however the overall cumulative effect is still assessed as slight adverse (not significant)</u>).
VP29 Common Lane W of Billyards Farm (Low)	Minor Adverse	All assessed schemes	Any operational infrastructure at 1.3 km distance is likely to be screened by mitigation planting in the foreground.	No significant cumulative effect (i.e. the Scheme is the main contributor to the effects experienced by this receptor, and these are not added to by

Viewpoint number, name and sensitivity	Residual Visual Effect	ID and name	Cumulative Visual Assessment	Cumulative Visual Effect
				the cumulative developments)

~~18.13.20~~18.13.21 In summary, the landscape and visual cumulative effects, as outlined in **Table 18-12** to **Table 18-18** will predominantly arise from:

- a. Cottam Solar Project [EN010133], which will extend the presence and perceptual influence of solar infrastructure within LLCA 3a Till Vale Open Farmland at all stages including Year 15 of operation;
- b. Cottam Solar Project [EN010133] which will extend the presence of solar infrastructure in representative viewpoints along Middle Street, including Viewpoint 4 (above Harpswell) at the Construction and Operation Year 1 stages; and Viewpoints 7 (Glentworth Cliff Farm) and 13 (Public footpath Hems/787/2 near Hemswell) at all stages, including Operation Year 15 (summer);
- c. ID 15 (Glentworth oil well), which will increase the presence of energy infrastructure at representative viewpoint 9 (Kexby Road, west of Glentworth); during the construction and operational stages; and
- d. All three solar DCO in combination at the (temporary) construction stage for four representative viewpoints along the Cable Route Corridor, where receptors are of a higher sensitivity and elements including construction compounds and access tracks will be in close proximity.

~~18.13.21~~18.13.22 With respect to the Cottam Solar Project [EN010133], cumulative landscape and visual effects will arise from the presence of solar infrastructure to areas both north and south of the Scheme (or from the Scheme 'infilling' between), thereby extending the presence and influence of solar infrastructure along an approximately 15 km north-south corridor within LLCA 3a, and in elevated representative viewpoints along Middle Street.

~~18.13.22~~18.13.23 Significant adverse landscape effects arising from the presence of more extensive solar infrastructure should, however, be considered in the context of long-term green infrastructure benefits.

~~18.13.23~~18.13.24 Further to the above, sequential visual impacts arise where an observer will obtain views of different developments when moving between viewpoints. The greatest cumulative impacts will generally occur where such views occur for higher-sensitivity receptors, e.g. those moving more slowly along recreational routes.

~~18.13.24~~18.13.25 Cumulative ~~impacts~~sequential visual effects are most likely for users of the bridleways between Kexby Road and Glentworth Road (including Gltw/85/1, Fill/767/1 and Fill/85/1), for which significant effects in relation to the Scheme are expected in relation to Viewpoint 9 (Kexby Road, west of Glentworth Grange) during construction and at operation (Year 1), including cumulative effects in relation to ID 15 (Glentworth oil well); and the Cottam Solar Project [EN010133]. To the south, open views will be expected of the Cottam Solar Project [EN010133], for which panels will be located at a minimum distance of approximately 300 m and 500 m east and west of the ~~route~~bridleways respectively. Recreational users of the quiet rural roads (Kexby Road and Willingham Road) and the aforementioned bridleways that provide a circular walking route west of Glentworth and ~~Fillingham~~Fillingham will ~~also therefore~~ experience close range view ~~views~~ of construction and the panels from the Scheme and Cottam Solar Project respectively [EN010133], particularly during the Construction and Operation Year 1 stages.

~~18.13.25~~ 18.13.26 Sequential views will also be available along Middle Street, as noted in the cumulative assessment above for Viewpoints 4, 7 and 8.

~~18.13.26~~ 18.13.27 Away from these locations, cumulative visual effects arising from sequential views will be experienced by lower sensitivity receptors (e.g. along the A631) and the limited PRoW network around the Scheme, which in turn reduces wider connectivity with other PRoW. Higher-sensitivity rural routes generally run east to west, requiring longer distances between viewpoints and cumulative schemes than if such routes ran north-south.

~~18.13.27~~ 18.13.28 The exception to the above is the proposed PRoW between Glentworth and Harpswell, which will fill a 'missing link' along the historic path running along the base of the Cliff, connecting the spring-line villages. Sequential views would be expected of the Scheme around Harpswell; and of the Cottam Solar Project [\[EN010133\]](#) further south, between Glentworth and Ingham.

~~18.13.28~~ 18.13.29 It is not considered that sequential views will result in any additional significant visual cumulative effects beyond those identified for the representative viewpoints described [above in Tables Table 18-16 to 18-18 above.](#)

18.14 Noise and Vibration

Introduction

18.14.1 The Zols for noise and vibration are 50m, 300m and 500m respectively, which are presented in **Figure 18-1** of this ES [\[EN010142/APP/6.3\]](#). The 50m Zol is in place for the effect of construction vibration, the 300m Zol is for the effect of construction noise and the 500m is for operational noise from the Principal Site). In addition to the solar DCOs, the other developments within the Noise and Vibration Zols with potential to generate cumulative effects are identified in **Table 18-19**.

18.14.2 The Zol for the construction and decommissioning traffic is 50m of the modelled road links. Cumulative schemes summarised within Section 18.17 of this chapter have been considered to assess the impacts on noise and vibration as a result of the cumulative traffic flows.

Table 18-19: Cumulative Noise and Vibration Developments (in addition to the solar DCOs)

Application ID	Consideration for assessment
ID 50. Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of Cottam Power Station	Potential cumulative noise and vibration effects during demolition of this development are assessed further below.
ID 76. Application Reference: 146100/PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development	Potential cumulative noise and vibration effects during construction of this scheme are assessed further below. The development is over 600m from sensitive receptors, therefore, cumulative operational noise effects

Application ID	Consideration for assessment
	are not expected and the development is scoped out from the cumulative assessment of the operational phase.
ID 79. Application Reference: PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure	Potential cumulative noise and vibration effects during construction and operation of this development are assessed further below.
ID 126. Application Reference 139890. County matter application PL-0130-19 for the erection of a gas transport filling station	Potential cumulative noise and vibration effects during construction of this development are assessed further below. Operational noise emissions are expected to be minimal and therefore, the development is scoped out from the cumulative assessment of the operational phase.
ID 174. Application Reference 147710. Request for a scoping opinion for proposed solar farm development at Stow Park	Potential cumulative noise and vibration effects during construction of this development are assessed further below. The scheme is outside the operational noise Zol and is therefore scoped out of further cumulative effects assessment in respect of operational noise.

Cumulative Effects During Construction

18.14.3 For the other solar DCOs, two scenarios are considered when identifying the potential for cumulative noise and vibration effects:

- a. Scenario 1: All four projects are constructed within a construction programme of 24-36 months. It is assumed all the ducts will be installed at once and launch and reception pits and trenches will be backfilled so the area can then be re-instated. The sequence and schedule for each project is not confirmed, therefore, as a worst case, three lots of separate cable-pulling activities are assumed for this Scenario. The access points, haul routes and compounds would remain in place for 24-36 months to enable the cable pulls.
- b. Scenario 2: The sequential installation of all four projects over a maximum 5-year period. The access points, haul routes and compounds would remain in place for up to 5 years.

18.14.4 A commitment is made in the **Framework CEMP [EN010142/APP/7.8]** that the Applicant will engage with other cumulative developments within 500 m of the Scheme and a collaborative working approach will be adopted where practicable. BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise Table B.1 provides guidance regarding noise level reductions that can be achieved from various interventions for a range of common construction related activities. It is expected that other developments also practicing Best

Practical Means (BPM) will implement these general measures where practical to minimise the cumulative impacts on nearby receptors, as set out in their respective applications (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13, Ref. 18-22, Ref. 18-23), where these are available.

18.14.5 The assessment of noise due to construction of the Cable Route Corridor was based on a worst-case scenario where works were assumed to be undertaken at the closest boundary to residential receptors. Even if other solar DCOs construct their Cable Route Corridor at the same time as the Scheme, it is unlikely that the worst-case scenario would be exceeded. However, the duration of these works is likely to be extended and, hence, the duration that receptors may be exposed to noisy works out of core hours would be increased. This extended exposure may affect the level of mitigation required for out-of-hours trenchless crossing work activities in which case the Section 61 process will be followed. This means that a Section 61 application will be made to the Local Authority for their consideration containing details of the works to be completed, the method by which the works will be completed, and the proposed process to minimise noise resulting from the works. Therefore, by following the proposed method and noise reducing interventions set out in the Section 61 application, the cumulative effects of construction noise and vibration along the Cable Route Corridor would be **neutral (not significant)**.

18.14.6 For all other identified cumulative developments, the precise scale of additional noise and vibration effects with the Scheme will depend on the exact works taking place at each location at any one time. However, the Scheme is required to comply with the mitigation measures detailed within the **Framework CEMP [EN010142/APP/7.8]** to reduce its construction noise effects as far as reasonably practicable. It has been assumed that the other developments will also be required to adopt Best Practicable Means (as defined in Section 72 of the Control of Pollution Act (Ref. 18-11) as industry-standard working practices during their construction phase and these mitigation measures would be documented within their own CEMPs, as set out within their respective applications (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13, Ref. 18-22, Ref. 18-23), where these are available. It is also assumed that noise and vibration levels of those other developments will comply with set limits in accordance with the applicable guidance. The cumulative effects of construction noise and vibration with the Scheme would therefore be **neutral (not significant)**.

18.14.7 The potential changes in cumulative construction traffic noise from these roads as a result of the Scheme have been considered by calculating a CRTN BNL at 10 m next to roads within the CRTN prediction range and comparing the change. **Table 18-20** presents the results of the assessment. Calculations estimate that daily construction traffic flows associated with the Scheme would be restricted to 140 HGV movement per day along any road.

Table 18-20: Cumulative Construction and Decommissioning Traffic Noise Assessment

Road ID	Road	Baseline BNL dB	Baseline and Cumulative Construction Traffic BNL dB	Change in Traffic Noise Level, dB	Effect Level
Rd3	B1398, South of A631	67.6	69.8	+2.2	Minor Adverse (not significant)
Rd4	A631, Hanover Hill, West of Spital Lane	69.8	72.3	+2.5	Minor Adverse (not significant)
Rd5	A15, North of Spital Lane	74.6	75.8	+1.2	Minor Adverse (not significant)
Rd9	B1241, South of Cot Garth Lane	66.9	69.5	+2.6	Minor Adverse (not significant)
Rd12	Stow Park Road, East of Adams Way	68.9	72.1	+3.2	Moderate Adverse (significant)
Rd14	High Street, South of Wapping Lane	69.3	71.3	+2.0	Minor Adverse (not significant)
Rd15	Cottam Road, East of Westbrecks Lane	63.8	69.4	+5.6	Major Adverse (significant)

18.14.8 Temporary changes in noise due to cumulative construction traffic at the majority of roads are identified as ranging from negligible to minor adverse. At these roads, cumulative traffic noise effects are unchanged from residual effects and would therefore be **neutral (not significant)**. The exception to this is at receptors along Stow Park Road, East of Adams Way and Cottam Road, East of Westbrecks Lane, which are predicted to experience temporary moderate adverse and major adverse effects, which are significant. An initial moderate adverse effect, resulting from traffic on Cottam Road associated with the Scheme, is reported in **Chapter 13: Noise and Vibration** of this ES [EN010142/APP/6.1]. As described in Section 13.9, the sequencing and physical separation of the Cable Route Corridor construction phase traffic, as secured through the **Framework CEMP [EN010142/APP/7.8]**, would prevent all the construction traffic from being on the same road at the same time and therefore such significant effects are not anticipated in practice. With this mitigation in place, the residual effect is considered to be **neutral (not significant)** on the three identified roads.

18.14.9 Changes in road traffic noise have only been calculated from roads with flows of greater than 1,000 Average Annual Weekday Traffic (AAWT). This is because the Calculation of Road Traffic Noise methodology is unreliable for traffic flows below an AAWT of 1,000. Consequently, a qualitative assessment of potential construction traffic noise effects has been undertaken based on average hourly construction traffic flows.

18.14.10 HGV movements will be distributed evenly across a 10-hour window. The average hourly number of cumulative HGV movements forecast on low-flow trafficked roads are presented in **Table 18-21**.

Table 18-21: Average Hourly HGV Movements on Low-flow Roads

Road ID	Road	Average HGV Movements per Hour
Rd16	School Lane, South of A631	9
Rd17	Cow Lane, East of Common Lane	16
Rd18	Fillingham Lane, East of Farm Track	43
Rd20	Headstead Bank, South of Broad Lane	39

18.14.11 The highest number of average hourly cumulative vehicle movements along a low traffic flow road is 39 and 43 movements per hour on Fillingham Road and Headstead Bank, respectively. This level of construction traffic may cause disturbance and result in a significant effect due to potential for receptors “having to keep windows closed most of the time because of the noise” (referenced from PPGN noise exposure hierarchy table – reproduced in **Appendix 13-1** of this ES [EN010143/APP/6.2]). This level of construction traffic is identified as an initial moderate adverse effect. However, when accounting for mitigation described in paragraph 18.14.8, which would restrict significant levels of construction traffic, the residual cumulative effect is considered to be **neutral (not significant)**.

18.14.12 Cumulative construction traffic on all other low-flow roads is not sufficient enough to be considered significant; however, disturbance may result in receptors “having to close windows for some of the time because of the noise” referenced from PPGN noise exposure hierarchy table – reproduced in **Appendix 13-1: Noise and Vibration Legislation, Policy and Guidance** of this ES [EN010142/APP/6.2]). This level of effect is equivalent to identified residual effects of the Scheme and therefore cumulative construction traffic noise effects would be neutral (not significant).

Cumulative Effects During Operation

18.14.13 For identified cumulative developments, operational noise effects will be dependent on the exact arrangement of fixed installations of the Scheme and other developments. It is identified that operational noise from the Scheme and cumulative developments may influence noise at the following sensitive receptors (as identified in **Chapter 13: Noise and Vibration** of this ES [EN010142/APP/6.1]):

- a. Cumulative effects with Cottam Solar Project on receptor R14 (Glentworth Grange / Low Farm / Spitals Farm / Orchard House / Westlands Farm, Kexby Road); and
- b. Cumulative effects with ID 79 (6MW anaerobic digestion plant) on receptor NR2 (St 'had's Church, Harpswell).

18.14.14 Operational noise levels from the Scheme and cumulative developments are below 30 dB L_Ar,Tr with the exception of ID 79, which has a rating noise level of 31 dB at NR2. The predicted levels of noise would not have an effect on health and quality of life. Although noise levels at R14 and NR2 may increase as a result of cumulative noise, the increase would be less than 3 dB and not perceptible to the average person. Consequently, cumulative operational noise will remain unchanged from the residual effects and would therefore be **neutral (not significant)**.

Cumulative Effects During Decommissioning

18.14.15 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction.

18.14.16 Mitigation measures for managing noise and vibration during decommissioning are documented within the **Framework DEMP [EN010142/APP/7.10]** and it assumed that any nearby construction/decommissioning sites would operate to a similar level of good practice in accordance with their own CEMPs/DEMPs. The cumulative effects of noise and vibration during decommissioning would therefore be **neutral (not significant)**.

18.15 Socio-economics and Land Use

Introduction

18.15.1 The relevant Zol for socio-economics and land use effects varies depending on the type of effect being assessed. As set out in **Chapter 14: Socio-Economics and Land Use** of this ES [EN010142/APP/6.1] and presented in **Figure 18-1** of this ES [EN010142/APP/6.3]:

- a. Local employment, Gross Value Added (GVA) and accommodation facilities effects are considered across a 60 minute drive-time area, West Lindsey and Bassetlaw districts; and the East Midlands region;
- b. For community severance effects, relevant communities fall within 1km of the Scheme;
- c. For effects on users of recreational routes and P_{RoW}, relevant routes fall within 500m of the Scheme;

- d. Impacts on agricultural production have been contextualised against the total agricultural land available in Lincolnshire county, the wider East Midlands region and England; and
- e. For local land use and amenity effects, the relevant residential properties, local businesses, open space, community facilities, visitor attractions and development land are within 500m of the Scheme.

18.15.2 In addition to the solar DCOs, other developments within the Zol with potential to generate cumulative socio-economic and land use effects are summarised within **Table 18-22**.

Table 18-22: Cumulative Socio-economics and Land Use Developments (in addition to the solar DCOs)

Application ID	Consideration for assessment
ID 6 One Earth Solar [EN010159]	Agricultural land / production in Lincolnshire
Heckington Fen Solar Park [EN010123]	Agricultural land / production in Lincolnshire
Mallard Pass [EN010127]	Agricultural land / production in Lincolnshire
Temple Oaks Renewable Energy Park [EN010126]	Agricultural land / production in Lincolnshire
Beacon Fen Energy Park [EN010151]	Agricultural land / production in Lincolnshire
Springwell Solar Farm [EN010149]	Agricultural land / production in Lincolnshire
Fosse Green Energy [EN010154]	Agricultural land / production in Lincolnshire
ID 50. Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of Cottam Power Station;	Potential for employment, GVA, local accommodation, local community severance and PRow, local land use and amenity cumulative effects.
ID 76. Application Reference: 146100/ PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development.	Potential for community severance and PRow, local land use and amenity cumulative effects.
ID 79. Application Reference: PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure.	Potential for employment, GVA, local accommodation, local community severance and PRow, local land use and amenity cumulative effects.
ID 126. Application Reference 139890. County matter application PL-0130-19 for the erection of a gas transport filling station.	Potential for employment, GVA, local community severance and PRow, local land use and amenity cumulative effects.
ID 174. Application Reference 147710. Request for a scoping opinion for proposed solar farm development at Stow Park.	Potential for employment, GVA, local accommodation, local community severance and PRow, local land use and amenity cumulative effects.

Application ID	Consideration for assessment
	Agricultural land / production in Lincolnshire

Cumulative Effects During Construction

Net Construction Employment

- 18.15.3 Should they go ahead, all the approved and submitted cumulative schemes listed above are anticipated to generate construction related employment in the local economy and employment study area (West Lindsey and Bassetlaw districts and East Midlands region).
- 18.15.4 The scale of the construction employment generated cannot be readily quantified as for some schemes this information is commercially sensitive and not publicly available. However, the combined effect of the construction of the cumulative developments and the Scheme will bring considerable additional employment to the study area. Based on the scale of development taking place, and the timeframes for which development is proposed overlapping with the Scheme, it is considered that the overall effect from the generation of construction employment at the West Lindsey and Bassetlaw scale is likely to increase from a temporary minor beneficial (not significant) effect to a temporary **cumulative moderate beneficial (significant)** effect.

Gross Value Added

- 18.15.5 The combined effect from the generation of GVA arising from the construction of the cumulative schemes in combination with the Scheme at the West Lindsey and Bassetlaw scale is likely to remain a temporary minor beneficial (not significant) effect. At the regional level, the impact would remain as negligible (not significant). This would therefore be **neutral (not significant)**.

Accommodation Facilities

- 18.15.6 To assess the effects of demand from the construction workforce on the local housing market, it is necessary to understand both the size of the cumulative workforce who might require accommodation and the likely availability of accommodation available to meet this requirement.
- 18.15.7 If the construction phases of multiple schemes were to overlap, then this would in turn increase demand in the accommodation sector from the increased workforce at a peak construction or decommissioning period. The following scenarios are assessed for the Scheme, and the cumulative solar DCOs:
- Scenario 1: The cumulative solar DCOs (including the Scheme) are installed within a construction programme of 24-36 months; or
 - Scenario 2: The cumulative solar DCOs (including the Scheme) are installed sequentially over a 5 year period.

- 18.15.8 Scenario 1 is assumed to result in a higher demand for construction employment, due to a more intensified schedule of works, and is therefore used as the basis for this assessment as a likely worst-case scenario.
- 18.15.9 The private rented homes sector is considered to be the principal sector for accommodating demand for housing from 'non-home based' construction workers, defined as workers who do not live in the Study Area (West Lindsey and Bassetlaw) and therefore require accommodation. Using the assumptions from Section 14.8 of **Chapter 14: Socio-Economics and Land Use** of this ES [EN010142/APP/6.1], in a 60-minute drive time area, there are approximately 527 private rented homes and 12,399 rooms in hotel, bed and breakfast and inns accommodation within a 60-minute drive time from the Scheme.
- 18.15.10 Within the assessment of local accommodation facilities in Section 14.8 of **Chapter 14: Socio-Economics and Land Use** of this ES [EN010142/APP/6.1], the effects of the Scheme were assessed as negligible (not significant). Based on analysis of the employment generated by the key cumulative Schemes (i.e. Gate Burton Energy Park, West Burton Solar Project, Cottam Solar Project) for which worker numbers by month are available, demand from workers will be able to be met by hotel, bed and breakfast accommodation and private rented accommodation when there is an overlap, given that there will be adequate availability within these sectors combined throughout the construction period. It is also noted that alternative accommodations (such as Airbnb, serviced apartments, etc.) exist that could be considered to cater for the demand and therefore mitigate further any impact of accommodation demand.
- 18.15.11 The Cumulative Construction Worker Accommodation Assessment provided within **Appendix C** of the **Applicant's Comments on Local Impact Reports** [EN010142/APP/9.26] supplements the assessment provided within this chapter. It is concluded that the cumulative effect is **slight adverse (not significant)**.

Local Community Severance and PRoW

- 18.15.12 The cumulative schemes could generate transport and traffic impacts, which, in combination with the Scheme, could generate cumulative community severance effects, should impacts occur at the same time. A number of PRoW diversions would be required during the construction, and decommissioning phases of the solar DCOs, and potential short-term closures could be required associated with the demolition of Cottam Power Station. However, these are expected to be temporary in duration and sporadic in nature.
- 18.15.13 No specific community severance impacts are reported arising from the cumulative schemes. Therefore, this is considered to be a **neutral (not significant) cumulative effect**.

Agricultural Production

- 18.15.14 In terms of loss of agricultural land, all cumulative solar schemes (i.e. Gate Burton Energy Park, West Burton Solar Project, Cottam Solar Project and those listed within **Table 18-22**) are temporary and will eventually be

decommissioned. The permanent loss of agricultural land is likely to be restricted to small areas, for example, where woodland planting is proposed.

18.15.15 As set out in Section 14.6 of **Chapter 14: Socio-Economics and Land Use** of this ES [EN010142/APP/6.1], the latest data show that there is a Utilised Agricultural Area (UAA) of 8.8 million hectares (ha) in England (Ref. 18-20) and 1,176,757 ha in the East Midlands (Ref. 18-21). The total amount of agricultural land in Lincolnshire is 488,915 ha.

18.15.16 The area of agricultural land within the Principal Site is approximately 1,212 ha, and combined with the other solar DCOs (i.e. Gate Burton Energy Park, West Burton Solar Project, Cottam Solar Project and those listed within **Table 18-22**), the area is approximately 10,616 ha. Based on the above, this equates to approximately:

- a. 0.12% of agricultural land in England;
- b. 0.90% of agricultural land in the East Midlands; and
- c. 2.2% of agricultural land in Lincolnshire.

18.15.17 Based on the above assessment, the reversible impacts on agricultural land represent a very small proportion of the agricultural land in England, East Midlands and Lincolnshire, therefore the cumulative effect on agricultural land would be **neutral (not significant)**.

Local Land Use and Amenity

18.15.18 The cumulative schemes have the potential to generate adverse amenity effects on local land uses including residential properties, local businesses, open space, community facilities, visitor attractions and development land. The Scheme is assessed to have no significant effect on the amenity of these receptors. In addition, other cumulative developments are not likely to result in significant amenity effects. As a result, the construction phase effect of the cumulative schemes and the Scheme on local land use and amenity effects (on receptors including residential properties, business premises, open space, community facilities, visitor attractions and development land) are assessed to be a **neutral (not significant) cumulative effect**.

Cumulative Effects During Operation

Net Operational Employment

18.15.19 If all the cumulative schemes come forward, there will be additional employment generation in the study area during operation. Given the nature of the cumulative schemes, and the Scheme, the direct number of jobs expected to be generated will be small in the context of the wider local economy. Therefore, the overall combined cumulative effect from the generation of workers during operation will therefore be **neutral (not significant)**.

Local Community and PRow

18.15.20 The Scheme is assessed to have a minor beneficial effect on this receptor due to the creation of two new permissive pathways in the operational phase, however, this effect would be lessened at a cumulative level given the scale

of the Scheme and the other cumulative developments. The operational phase effect of the cumulative schemes and the Scheme on local community severance is therefore **neutral (not significant)**, as the Scheme and available cumulative developments' traffic analyses show the schemes are unlikely to lead to community severance, and the new permissive pathways only provide a minor benefit.

Agricultural Production

18.15.21 As detailed above for the construction phase, the cumulative effect on agricultural land during operation of the Scheme would be **neutral (not significant)**, as there is no further land take of agricultural land further to that assessed for construction.

Local Land Use and Amenity

18.15.22 The Scheme assessment concluded that there will be no effect on this receptor on either the Cable Route Corridor or the Principal Site during operation. Similarly, the operational phase effect of the cumulative schemes and the Scheme on local land use and amenity effects on receptors including residential properties, business premises, open space, community facilities, visitor attractions and development land is assessed to be **neutral (not significant)**.

Cumulative Effects During Decommissioning

18.15.23 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those during construction and would be expected to be beneficial.

18.15.24 There is potential for adverse cumulative socio-economic and land use effects during decommissioning of other solar DCOs and the Scheme, with respect to community severance, PRoW users, land use and amenity, should impacts occur at the same time. However, these effects are not likely to exceed those assessed during construction and therefore, are likely to be **neutral (not significant)**.

18.16 Soils and Agriculture

Introduction

18.16.1 All cumulative schemes short-listed for assessment within **Appendix 18-1** of this ES [EN010142/APP/6.2] were reviewed for consideration within the soils and agriculture cumulative effects assessment. The below schemes were considered to have a potential to result in significant cumulative effects with regards to soils and agriculture in Lincolnshire, due to their land-take of agricultural land:

- a. Gate Burton Energy Park [EN010131];

- b. West Burton Solar Project [EN010132];
- c. Cottam Solar Project [EN010133];
- d. One Earth Solar [EN010159];
- e. Beacon Fen Energy Park [EN010151];
- f. Springwell Solar Farm [EN010149];
- g. Fosse Green Energy [EN010154];
- h. Heckington Fen Solar Park [EN010123];
- i. Mallard Pass [EN010127];
- j. Temple Oaks Renewable Energy Park [EN010126]; and
- k. ID 174. Application Reference 147710. Request for a scoping opinion for proposed solar farm development at Stow Park.

Cumulative Effects during Construction

18.16.2 With regards to the loss of agricultural land and soil resource, all solar DCOs on agricultural land will be temporary and decommissioned, with no significant effect with regards to the loss of agricultural land extent, degradation of quality or loss of soil resource. In addition, cropland would be converted to grassland underneath the solar PV panels that can be used for grazing. Therefore, the residual effect of each of the developments on the agricultural land and soil resource is predicted to be not significant, as for the Scheme. The cumulative effect is also assessed to be **not significant**, considering the vast arable landscape that these developments sit within. It is also noted that the Scheme would not result in any permanent loss of Best and Most Versatile (BMV) agricultural land to 'hard development' (which includes permanent sealing of the land and excludes any woodland planting), and therefore, would not contribute to any cumulative impact on BMV land.

18.16.3 For farming circumstances, there is potential for interaction between the Scheme and cumulative developments where land occupancy is split across sites or there are land management relationships between occupants such as contract farm management agreements. However, any such interaction may not be apparent as full agricultural ownership and lease details are not necessarily disclosed as part of the Environmental Impact Assessment (EIA), and nor are commercial relationships between farm businesses.

18.16.4 Although interactions between farm businesses of cumulative developments may not be apparent, significant adverse cumulative effects resulting from such an interaction are unlikely, as secure tenure over land will not form part of such a relationship. Owner occupation by a farm business across cumulative developments is also unlikely to cause any significant adverse cumulative effect as a landowning farm business would derive a substantial benefit from the diversified enterprise of the solar farm development.

18.16.5 The cumulative effects with regards to soils and agriculture during the construction phase are therefore assessed as neutral (not significant).

Cumulative Effects during Operation

- 18.16.6 There is no further land take of agricultural land in addition to that assessed for construction across the cumulative developments, and as such there are no additional cumulative effects with regards to agricultural land and farming circumstances.
- 18.16.7 Soil resources remain in place and undisturbed for all of the agricultural land used by the solar DCOs. Where these soils are present on arable land, the temporary solar use for each of the cumulative developments will revert that land to low input pasture. This reversion to pasture enables a recovery of soil organic matter (and soil health) towards a higher equilibrium than that under arable management with cultivation. Therefore, the residual effect of each of the cumulative developments on the soil resource is predicted to be a moderate beneficial effect (significant), which is accrued through the operational phase, as for the Scheme. The cumulative effect is assessed to be **not significant**, considering the vast arable landscape that these developments sit within.

Cumulative Effects during Decommissioning

- 18.16.8 As set out within **Chapter 15: Soils and Agriculture** of this ES [EN010142/APP/6.1], in a worst-case scenario, the Scheme could result in the loss of approximately 2.5 ha of non-BMV agricultural land, if substations are retained on site post-decommissioning. It is assumed that similarly to the Scheme, the majority of the agricultural land used by the solar DCOs would be reverted back to agricultural land. As such, no significant cumulative effects with regards to agricultural land, soil resource and farming circumstances have been identified.
- 18.16.9 The Report on Cumulative Impacts of Solar Projects on Agricultural Land in Lincolnshire, submitted at Deadline 1 as part of the **Applicant's Response to Relevant Representations [REP1-028]**, supplements the Applicant's assessment on the cumulative impacts of the Scheme and other solar projects on agricultural land in Lincolnshire. This supplementary information did not change the conclusions in this chapter. This assessment concluded there is likely to be a negligible impact on BMV land, specifically in Lincolnshire, as a result of solar DCO projects and solar Town and Country Planning Act projects. The Applicant notes that the majority of projects will be temporary in nature, and the change of use of agricultural resource, including BMV land, is largely reversible at the end of most of these projects' lifetimes.

18.17 Transport and Access

Introduction

- 18.17.1 The Zol for transport and access is 5km and is presented in **Figure 18-1** of this ES [EN010142/APP/6.3]. In addition to the solar DCOs, the other developments within the Zol with potential to generate cumulative effects are:
- ID 4. West Burton C Power Station [EN010088];
 - ID 5. North Humber to High Marnham Energy Grid [EN020034];

- c. ID 6. One Earth Solar Farm [EN010159];
- d. ID 19. Application Reference: 1/22/01031/CDM. Construction of an underground foul water rising main at Cottam Power Station;
- e. ID 50. Application Reference: 19/00167/SCR & 21/01661/DEM. Demolition of Cottam Power Station;
- f. ID 54. Application Reference 22/00831/SCR. Screening –pinion - Demolition of West Burton Power Station;
- g. ID 55. Application Reference 22/01219/SCR. Screening –pinion - Demolition of West Burton Power Station;
- h. ID 76. Application Reference: 146100/ PL/0135/22. To construct a hydrocarbon wellsite at Glentworth Oil site, with the drilling of one vertical appraisal well and up to seven horizontal development wells and ancillary development;
- i. ID 79. Application Reference: PL/0100/22. To construct a 6MW anaerobic digestion plant with associated infrastructure;
- j. ID 110. Application Reference: 145239. A multi-use development comprising 2,046 residential units and various community facilities on Foxby Lane, Gainsborough;
- k. ID 126. Application Reference 139890. County matter application PL-0130-19 for the erection of a gas transport filling station;
- l. ID 132. Application Reference: 136937. A residential development comprising 750 units at land north-east of Highfields roundabout, Corringham; and
- m. ID 174: Application Reference 147710. Request for a scoping opinion (previously screening opinion) for proposed solar farm development at Stow Park.

Cumulative Effects During Construction

18.17.2 The developments identified above have been screened for spatial and temporal overlaps with the Scheme. For transport and access, this relates to the roads in the vicinity of the Scheme that are expected to be used to access each of the relevant schemes during the peak construction period in 2026.

18.17.3 As set out in **Chapter 16: Transport and Access** of this ES [EN010142/APP/6.1], TEMPro growth factors have been applied to the 2022 surveyed traffic flows to reflect local housing and employment growth and to derive future baseline traffic flows for the peak construction year of 2026. Therefore, for the housing and mixed use schemes within the Zol (which are allocated developments in their respective local plans), the additional trips have already been included in the modelled assessments for the surrounding highway network. In addition, several of the cumulative schemes are not expected to have the potential to result in cumulative effects during the peak construction phase (2026) in terms of transport and access due to no overlap in the construction periods of those developments with the Scheme (e.g. the developments being built out and operational before the future baseline year of 2026).

18.17.4 Further details are set out below:

- a. ID 4. West Burton C Power Station [EN010088] is an NSIP granted approval in October 2020 for a power station capable of generating up to 299MW of electrical generation capacity, located approximately 5km to the north-west of the Order limits. Based on the information set out within the Environmental Statement, Traffic and Transport Chapter (May 2019) (Ref. 18-14), the construction period is expected to occur between Q3 2027 and Q3 2030, Therefore, the West Burton C Power Station will not overlap with the Scheme's proposed peak of construction (2026). As such, it has been **scoped out** of the cumulative assessment.
- b. ID 5. North Humber to High Marnham Energy Grid is an NSIP being brought forward by the National Grid. A new high voltage electricity transmission line and associated works is proposed between a new substation north of Hull at Creyke Beck in the East Riding of Yorkshire and a new substation at High Marnham, located 2.4 km to the west of Cottam Power Station in Nottinghamshire. The Project Background document produced by the National Grid in June 2023 (Ref. 18-16) states that the DCO submission is projected to occur in Spring 2026, given that a decision is typically made between 12 and 15 months after the application has been submitted, it is not expected for there to be any overlap between the construction trips associated with this development (with the earliest potential of consent being granted in 2027) and the proposed peak of construction for the Scheme (2026). As such, the North Humber to High Marnham Project will not overlap with the Scheme and has been **scoped out** of this cumulative assessment.
- c. ID 6. One Earth Solar Farm [EN010159] is an NSIP, the project comprises of the construction of a Solar Farm and collated Battery Energy Storage System (BESS) that would allow for the generation, export and storage of electricity exceeding 50 MW, located 4.8km south of the Cable Route Corridor at the border to Nottinghamshire and Lincolnshire. The project is at an early stage of development, with first public consultation having occurred between September and November 2023, and therefore statutory consultation is yet to take place. At this early stage it is considered that this could have the potential for cumulative effects during the construction phase (if the scheme comes forward and overlaps with the proposed peak of construction (2026), however, there is currently insufficient information available to confirm this in terms of anticipated programme and vehicle trips. As such, it is not possible to confirm at this stage and this would need to be reviewed when further information becomes available about the project timeframes. However, it is considered unlikely to result in an impact given that a decision is typically made between 12 and 15 months after the DCO application has been submitted, which is only expected to occur in Winter 2024 (based on the current programme timeline available on the developer's website (Ref. 18-29). The One Earth Solar Farm is therefore **scoped out** of the cumulative assessment.
- d. ID 19. Planning consent has been granted for the construction of an underground foul water rising main at Cottam Power Station, Cottam Sewage Scheme (planning application 1/22/01031/CDM). Based on the

Transport Statement submitted to Nottinghamshire County Council in August 2022, the planned works were expected to occur for a period of six months, commencing in September 2022. Whilst it is not known whether construction has been completed, the development is still expected to be complete before 2026. Therefore, the development has been **scoped out** of further assessment as it is assumed to have been completed by 2026 and therefore to have no impact on the construction (and operation) of the Scheme.

- e. ID 50. The demolition of the Cottam Power Station (planning application 19/00167/SCR & 21/01661/DEM), located adjacent to the Scheme at the southern section of the Cable Route Corridor, is proposed. The development has been excluded from the cumulative assessment on the basis of it being completed by late 2025 (Ref. 18-22). In addition the application documents for this development confirm that there would be fewer demolition trips in comparison to those associated with existing operations at the Power Station. Therefore, the demolition trips associated with this development have been **scoped out** of the cumulative assessment.
- f. ID 54 and ID 55. Demolition of West Burton Power Station, located approximately 5km to the north-west of the Order limits, has been excluded from the cumulative assessment as the proposed demolition work has been assessed to generate fewer additional trips in comparison to those associated with existing operations at the Power Station. In addition, the decommissioning of the Power Station is expected to be completed before the Scheme's construction peak year in 2026. The decommissioning trips associated with this development have therefore been **scoped out** of the cumulative assessment.
- g. ID 76. Application 146100/ PL/0135/22 for the construction of a hydrocarbon wellsite off Northlands Road in Glentworth has been granted consent (February 2024). The development, also known as Glentworth Oil Extraction Site, is expected to utilise parts of the highway network within the Scheme's Zol and has therefore been **scoped in** the cumulative assessment with further details provided below.
- h. ID 79. Planning application PL/0100/22 for a construction of a 6MW anaerobic digestion plant and associated infrastructure, accessed from the A631, located approximately 1.5 km from the Principal Site. The Transport Assessment (July 2023) undertaken for the application suggests the proposed development is expected to generate a maximum total of 13 two-way movements during a weekday peak hour (when the development is fully operational), this is not expected to generate material impact on the local highway network. The development has therefore been **scoped out** of this cumulative assessment as the trips generated by the site would not have a material impact on the network.
- i. ID 110. Planning consent has been partially granted to date for a multi-use development comprising of up to 2,046 residential units and various community facilities accessed off Foxby Lane, Gainsborough, to the west of the Scheme (planning application 145239). The proposed development is set to be built out in four phases between 2022 to 2032. Based on the Transport Assessment produced in June 2022, the

development is expected to be built out at a rate of approximately 200 dwellings per year. As the development utilises allocated land (forming part of Gainsborough's Local Plan Policy LP39 (Ref. 18-11)) and is expected to be partially operational by the future baseline year (2026), it is assumed that any trips related to the development will have been incorporated as part of the background traffic growth that has been applied to the network using TEMPro for the Scheme's assessment. As such, while the development is **scoped in** to the cumulative assessment and no additional trips have been included on the network for the assessment in association with this development.

- j. ID 126. Planning application 139890. for the erection of a gas transport filling station, accessed from the A631, located approximately 1.5 km from the Principal Site. Decision was granted in October 2019, the development is expected to be built out and operational by 2026 and it has therefore been **scoped out** of this cumulative assessment.
- d. ID 132. Planning consent has been granted for a new residential development comprising of 750 units at land north-east of Highfields roundabout, Corringham, west of the Scheme, east of Gainsborough, to be accessed via the B1433 and A631 (planning application 136937). The proposed development is set to be built out in two phases; the first phase is expected to provide 130 units and is set to be completed by 2022/2023 and phase two is set to begin on the completion of the first phase and to comprise up to 620 units, with the expected completion year of 2036. The proposed development is expected to be built out with an average of 45 units per year, with approximately 40% of units expected to be completed by the future baseline year (2026). Based on the Transport Assessment, there are expected to be very few additional trips on the section of the A631 within the Scheme's ZoI and as the development is allocated within the Corringham Neighbourhood Plan (Ref. 18-12), these trips would already be captured by the background traffic growth that has been applied to the network using TEMPro. In addition, there are expected to be limited construction trips associated with the construction of 45 units per year. As such, while the development is **scoped in** to the cumulative assessment, no additional trips have been included on the network in association with this development and therefore it is assessed to have no cumulative impact on the construction (and operation) of the Scheme.
- k. ID 174. Stow Park Solar Farm is located approximately 480 m from the Cable Route Corridor. It is a 35MW scheme with construction expected to commence in late 2024. Based on experience of other solar developments which are less than 50MW, the construction phase is expected to last between 4-8 months with a peak of approximately 16 HGVs and 20 workers per day. This is not expected to generate material impact on the local highway network. In addition, Stow Park Solar Farm is expected to be built out and operational by 2026 and it has therefore been **scoped out** of this cumulative assessment.

18.17.5 Based on the above, it is considered that in addition to the other solar DCOs (West Burton Solar Project (Ref. 18-7), the Cottam Solar Project (Ref. 18-8) and the Gate Burton Energy Park (Ref. 18-9)), only the Glentworth Oil Extraction Site (Ref. 18-12) has the potential to result in cumulative effects

with the Scheme during the peak construction phase (2026) which have not otherwise already been included in the assessments.

18.17.6 A figure showing the Zol and construction vehicle routes for the Scheme, the other solar DCOs, and the Glentworth Oil Extraction Site is provided in **Figure 18-5** of this ES [EN010142/APP/6.3].

18.17.7 To better understand the cumulative effects associated with the other solar DCOs, the following scenarios have been considered:

- a. Scenario 1: All four projects' ducts and cables are installed within a construction programme of 24 months. It is assumed all the ducts will be installed at once and launch and reception pits and trenches will be backfilled so the area can then be re-instated. The sequence and schedule for each project is not confirmed, therefore, as a worst case, four lots of separate cable-pulling activities are assumed. The access points, haul routes and compounds will remain in place for 24 months to enable the cable pulls.
- b. Scenario 2: The sequential installation of all four projects' ducts and cables over a maximum five-year period. The access points, haul routes and compounds would remain in place for up to five years.

18.17.8 For the purposes of transport and access, it is considered that a shared Cable Route Corridor would reduce potential cumulative effects associated with the Scheme and the solar DCOs. In terms of Scenario 1, this would allow the same pits, trenches, access points, haul routes and compounds to be used, thereby consolidating and reducing trips across the network compared to a situation where separate Cable Route Corridors were taken forward. In terms of Scenario 2, the sequential installation of ducts and cables would reduce any temporal overlap between the Scheme and the solar DCOs, thereby reducing the peak level of cumulative activity and associated vehicle movements. Whilst this would elongate the overall programme covered by the four schemes, it would minimise any cumulative impacts.

18.17.9 For a worst-case assessment, the subsequent sections of this chapter consider Scenario 1, which incorporates peak construction traffic from all four schemes but assumes no consolidation of trips as a result of coordinating the construction of these schemes.

West Burton Solar Project

18.17.10 The cumulative impact assessment of the West Burton Solar Project includes the considerations set out within the Environmental Statement submitted as part of the DCO submission in March 2023, the updated Addendum to the Transport ES chapter, which was submitted during the examination period in November 2023, Transport Assessment (Revision C, February 2024) and the Outline PRow Management Plan (Revision D, February 2024), it should be noted these documents were considered to be the latest to date and available to the public domain when writing this cumulative chapter in March 2024.

18.17.11 Chapter 14: Transport and Access of the West Burton Solar Project ES was prepared by Transport Planning Associates (TPA) in March 2023 (Ref. 18-7). The transport study area is shown on Figure 14.1 of the West Burton Solar Project ES and includes the A1500, the A15, the B1241 Mill Lane/ Sturton Road and the A57 Saxilby Road.

18.17.12 The West Burton Solar Project consists of three land parcels and is expected to be constructed over a 24-month period (starting in 2024 at the earliest), with a planned grid connection date of 2029. Therefore, whilst the West Burton Solar Project may be almost complete prior to the peak construction phase of the Scheme (2026), there is likely to be an overlap with the Scheme, which has been considered below.

18.17.13 West Burton Solar Project's parcels WB1, WB2 and WB3 are all located to the south of the A1500 Till Bridge Lane, towards Sturton-by-Stow. The cumulative assessment therefore focusses on these parcels and the Cable Route Corridor. A summary of each parcel is set out below and further details relating to the proposed access point(s) for each parcel and the Cable Route Corridor are provided within the West Burton Solar Project ES (Ref. 18-7).

Parcel WB1

18.17.14 Parcel WB1 is located to the south of the A1500 and is the smallest of the three parcels. It is currently expected that during construction, the parcel would be accessed via two junctions on the unclassified road to the east of Broxholme which connects to the A1500 (both of the proposed access points are expected to be utilised in the operational phase as well).

18.17.15 The construction vehicle routing for parcel WB1 is proposed via the A15 and the A1500 (from the east), therefore trips related to parcel WB1 would be expected to utilise parts of the highway network located within the Scheme's Study Area and therefore have been **scoped into** the cumulative assessment.

Parcel WB2

18.17.16 Parcel WB2 is located to the west of parcel WB1 and to the south of the A1500. It is currently expected that during construction, the parcel would be accessed via three junctions from the B1241 Sturton Road (as the road bisects the parcel).

18.17.17 The construction vehicle routing for parcel WB2 is proposed via the A57 and B1241, therefore trips related to parcel WB2 would not be expected to utilise parts of the highway network located within the Scheme's Study Area and therefore trips associated with parcel WB2 have been **scoped out** of the cumulative assessment.

Parcel WB3

18.17.18 Parcel WB3 is located to the north-west of parcel WB2, and to the south of the A1500. The Sheffield to Lincoln railway line runs through the land parcel in a south-east to north-west alignment. It is currently expected that during construction, the parcel would be accessed via two junctions, both on the

A1500 (both of the proposed access points are expected to be utilised in the operational phase as well).

18.17.19 The construction vehicle routing for parcel WB3 is proposed via the A15 and A1500 (from the east), therefore trips related to parcel WB3 would be expected to utilise parts of the highway network located within the Scheme's Study Area and therefore have been **scoped into** the cumulative assessment.

Cable Route Corridor

18.17.20 As detailed in Appendix 14.1: Transport Assessment of the West Burton Solar Project ES (Ref. 18-7), the Cable Route Corridor for the scheme is 21 km in length and is expected to be built out over a 20-month construction period. Nineteen Cable Route Corridor accesses are proposed and construction vehicles will be distributed across any four accesses per day during the construction period.

18.17.21 The construction vehicle routing across the highway network for the Cable Route Corridor can be found in Figure 6-4 of Appendix 14.1: Transport Assessment of the ES for the West Burton Solar Project (Ref. 18-7).

Construction Trips – Parcel WB1 and WB3

18.17.22 Based on Appendix 14.1: Transport Assessment of the West Burton Solar Project ES (Revision C, February 2024) (Ref. 18-7)), the construction phase is expected to require 455 workers across all three parcels, with the assumption of 163 vehicle arrivals and 163 vehicle departures each day associated with the construction staff (50% will arrive/ depart via shuttle bus and 50% will travel by car with an average car occupancy of 1.5).

18.17.23 Non-local workers would stay at local accommodation and be transported to the parcels via shuttle bus to minimise the impact on the surrounding highway network.

18.17.24 As mentioned above, the A1500 and A15 form the only links which pass through both Principal Site transport study areas for the Scheme and the West Burton Solar Farm Project. The A1500 and A15 have therefore been reviewed further to identify any significant cumulative effects on transport and access receptors.

18.17.25 The A1500 and A15 have both been assigned a low level of sensitivity within the West Burton Solar Project ES and the following is identified within Chapter 14: Transport and Access (Ref. 18-7):

- a. Table 14.15 identifies that an additional 266 daily two-way traffic movements are forecast on the A1500 Till Bridge Lane and A15 during the peak construction phase of the West Burton Solar Farm Project, including 33 two-way HGVs;
- b. Table 14.18 identifies that this equates to a 5% increase in total traffic flows and a 4% increase in HGVs on the A1500 Till Bridge Lane in comparison to future baseline (2025) traffic flows;

- c. Table 14.18 identifies that this equates to a 2% increase in total traffic flows and a 1% increase in HGVs on the A15 in comparison to future baseline (2025) traffic flows; and
- d. Table 14.18 identifies that given the above percentages (below the 30% impact threshold as defined by Rule 1 of the IEMA Guidelines (Ref. 18-14)) and due to the 'low' sensitivity of the A1500 Till Bridge Lane and A15, that these parts of the network **do not warrant further assessment.**

Construction Trips – Cable Route Corridor

18.17.26 Based on Appendix 14.1: Transport Assessment of the ES (Ref. 18-7) for the West Burton Solar Project, the following trips associated with the construction of the Cable Route Corridor will be distributed across any four of the 19 accesses per day during the construction period:

- a. 16 HGV deliveries (32 two-way daily vehicle movements);
- b. 16 LGV deliveries (32 two-way daily vehicle movements); and
- c. 40 construction workers travelling in single occupancy private vehicles (equating to 80 two-way daily vehicle movements).

18.17.27 To provide a worst-case assessment, 100% of the above trips have been distributed across the A1500, A156, A15, Cottam Road and Headstead Bank which are within the Scheme's Study Area. However, it should be noted that Cottam Road and Headstead Bank are only expected to experience trips related to one access (Access 108), therefore the assessment considered for Cottam Road and Headstead Bank overestimates the proposed number of trips related to the West Burton Cable Route Corridor accesses.

Construction Trips – Principal Site and Cable Route Corridor Combined

18.17.28 The peak daily construction traffic flows as a result of the West Burton Solar Project ES (Ref. 18-7) are summarised in **Table 18-23** below. The lowest future baseline traffic flows recorded on each link (which are the most robust in terms of identifying proportional changes) have been taken from Table 16-17 of **Chapter 16: Transport and Access** of this ES [EN010142/APP/6.1]. The assessment of the West Burton Solar Project cumulatively with the Scheme and the other cumulative developments considered within this assessment is presented within **Table 18-27**.

Table 18-23: The West Burton Solar Project Peak Daily Construction Traffic Flows (Two-Way)

Network	Link Sensitivity	Future Baseline	West Burton Parcels WB1-WB3*	West Burton Cable Route Corridor**		
				HGVs	LGVs	Construction Staff Vehicle Movements
A1500	Low Sensitivity	4,216	+266	+32	+32	+80

Network	Link Sensitivity	Future Baseline	West Burton Parcels WB1-WB3*	West Burton Cable Route Corridor**		
				HGVs	LGVs	Construction Staff Vehicle Movements
A15	Low Sensitivity	13,559	+266	+32	+32	+80
A156	Low Sensitivity	5,967	+0	+32	+32	+80
Cottam Road	Very Low Sensitivity	1,109	+0	+32	+32	+80
Headstead Bank	Low Sensitivity	179	+0	+32	+32	+80

*taken from Table 14.15 of the West Burton Solar Project ES (Ref. 18-7).

**taken from Section 5.23 and 6.16 of Appendix 14.1: Transport Assessment of the West Burton Solar Project ES (Ref. 18-7).

Cottam Solar Project

- 18.17.29 The cumulative impact assessment of the Cottam Solar Project includes the considerations set out within the Environmental Statement submitted as part of the DCO submission in January 2023, the updated Addendum to the Transport ES chapter, which was submitted during the examination period in November 2023, Transport Assessment (Revision C, February 2024) and the Outline PRoW Management Plan (Revision E, February 2024), it should be noted these documents were considered to be the latest to date and available to the public domain when writing this cumulative chapter in March 2024.
- 18.17.30 Chapter 14: Transport and Access of the Cottam Solar Project ES was prepared by TPA in January 2023 (Ref. 18-8). The transport study area is shown on Figure 14.1 of the Cottam Solar Project ES and includes the A1500, the A15, the A631, the B1205 Kirton Road and Stow Lane.
- 18.17.31 The Cottam Solar Project consists of three land parcel sites and is expected to be constructed over a two-year period (starting in 2024 at the earliest), with a planned grid connection date of 2028. Therefore, whilst Cottam Solar Project may be complete prior to the peak construction phase of the Scheme (2026), there is likely to be some overlap, which has been considered in the following paragraphs.
- 18.17.32 Cottam Solar Project parcels C1, C2 and C3 are all located to the west of the A15 between Lincoln and Scunthorpe. The cumulative assessment therefore focuses on these parcels and the Cable Route Corridor. A summary of each parcel is set out below and further details relating to the proposed access point(s) for each parcel and the Cable Route Corridor are provided within the Cottam Solar Project ES (Ref. 18-8).

Parcel C1

18.17.33 Parcel C1 is located to the north of the A1500 and is the largest of the three parcels. It is currently expected that during construction, the parcel would be accessed via 11 junctions; one from Thorpe Lane, one from Fleets Lane, one from Stow Lane, three from Willingham Road, one from Ingham Road, two from Coates Lane, one from South Lane and one from Stone Pit Lane.

18.17.34 The construction vehicle routing for C1 is proposed via the A15 from the south, the A1500 Till Bridge Lane and minor roads leading to the site access points (including Stow Lane, Willingham Road and Stow Road). Therefore, trips related to C1 would be expected to utilise parts of the highway network located within the Scheme's Study Area and therefore have been **scoped into** the cumulative assessment.

Parcel C2

18.17.35 Parcel C2 is located to the north of C1 and to the east of the village of Corringham, to the north of the A631. It is currently expected that during construction, the parcel would be accessed via a junction on the A631 to the east of Corringham.

18.17.36 The construction vehicle routing for C2 is proposed via the A631, from the A15. Therefore, trips related to C2 would be expected to utilise parts of the highway network located within the Scheme's Study Area and therefore have been **scoped into** the cumulative assessment.

Parcel C3

18.17.37 Parcel C3 is located to the north of C2 and is split into two distinct areas, C3a is located around the village of Blyton whilst C3b is located to the east of Pilham. It is currently expected that during construction, parcel C3a would be accessed via two junctions on the B1205, to the east of Blyton. For parcel C3b, it is currently expected that access would be via a junction to the west of the parcel on Station Road.

18.17.38 The construction vehicle routing for C3 is proposed via the B1205 off the A15. Although the trips related to C3 would be expected to utilise the A15 north which is outside the Scheme's Study Area, these trips have been **scoped into** the cumulative assessment below to ensure the worst-case cumulative impacts are assessed.

Cable Route Corridor

18.17.39 As detailed in Appendix 14.1: Transport Assessment of the ES for the Cottam Solar Project (Ref. 18-8), the Cable Route Corridor for the scheme is 27.5 km in length and is expected to be built out over a 24-month construction period. 32 Cable Route Corridor accesses are proposed and construction vehicles will be distributed across any four accesses per day during the construction period.

18.17.40 The construction vehicle routing across the highway network for the Cable Route Corridor can be found in Figure 6.6 of Appendix 14.1: Transport Assessment of the ES for the Cottam Solar Project (Ref. 18-8).

Construction Trips – Principal Site

- 18.17.41 Based on Appendix 14.1: Transport Assessment of the ES (dated January 2023 (Ref. 18-8)) for the Cottam Solar Project, the construction phase is expected to require 650 workers across all three parcels, with the assumption of 233 vehicle arrivals and 233 vehicle departures associated with the construction staff each day (50% will arrive/ depart via shuttle bus and 50% will travel by car with an average car occupancy of 1.5).
- 18.17.42 Non-local workers would stay at local accommodation and be transported to the parcels via shuttle bus to minimise the impact on the surrounding highway network.
- 18.17.43 As mentioned above, the A1500, A15 and A631 form the only links which pass through both Principal Site transport study areas for the Scheme and the Cottam Solar Project. The A1500, A15 and A631 have therefore been reviewed further to identify any significant cumulative effects on transport and access receptors.
- 18.17.44 The A1500, A15 and A631 have all been assigned a low level of sensitivity within the Cottam Solar Project ES and the following is identified within Chapter 14: Transport and Access (Ref. 18-8):
- a. Table 14.16 identifies that an additional 96 daily two-way traffic movements are forecast on the A1500 Till Bridge Lane during the peak construction phase of the Cottam Solar Project, including 15 two-way HGVs. This equates to a 2% increase in total traffic flows and a 2% increase in HGVs on the A1500 Till Bridge Lane in comparison to future baseline (2025) traffic flows (as set out in Table 14.19);
 - b. Table 14.16 identifies that an additional 581 daily two-way traffic movements are forecast on the A15 during the peak construction phase of the Cottam Solar Project, including 115 two-way HGVs. This equates to a 4% increase in total traffic flows and a 5% increase in HGVs on the A15 in comparison to future baseline (2025) traffic flows (as set out in Table 14.19);
 - c. Table 14.16 identifies that an additional 67 daily two-way traffic movements are forecast on the A631 during the peak construction phase of the Cottam Solar Project, including 15 two-way HGVs. This equates to a 1% increase in total traffic flows and a 2% increase in HGVs on the A631 in comparison to future baseline (2025) traffic flows (as set out in Table 14.19); and
 - d. Table 14.19 identifies that given the above percentages (below the 30% impact threshold as defined by Rule 1 of the IEMA Guidelines (Ref. 18-14)) and due to the 'low' sensitivity of the A1500, A15 and the A631, that these parts of the network **do not warrant further assessment**.

Construction Trips – Cable Route Corridor

- 18.17.45 Based on Appendix 14.1: Transport Assessment of the ES for the Cottam Solar Project (Ref. 18-8), the following trips associated with the construction

of the Cable Route Corridor will be distributed across any four of the 32 accesses per day during the construction period:

- a. 16 HGV deliveries (32 two-way daily vehicle movements);
- b. 16 LGV deliveries (32 two-way daily vehicle movements); and
- c. 40 construction workers travelling in single occupancy private vehicles (equating to 80 two-way daily vehicle movements).

18.17.46 To provide a worst-case assessment, 100% of the above trips have been distributed across the A1500, A15, A631, A156, B1398, Cow Lane, Fillingham Lane, B1241, Cottam Road and Headstead Bank which are within the Scheme's Study Area.

Construction Trips – Principal Site and Cable Route Corridor Combined

18.17.47 The peak daily construction traffic flows as a result of the Cottam Solar Project based on the information contained within Chapter 14: Transport and Access of the Cottam Solar Project ES (Ref. 18-8), are summarised in **Table 18-24** below. The lowest future baseline traffic flows recorded on each link (which are the most robust in terms of identifying proportional changes) have been taken from Table 16-17 of Chapter 16: Transport and Access of this ES [EN010142/APP/6.1]. The assessment of the Cottam Solar Project cumulatively with the Scheme and the other cumulative developments considered within this assessment is presented within **Table 18-27**.

Table 18-24: The Cottam Solar Project Peak Daily Construction Traffic Flows (Two-Way)

Network	Link Sensitivity	Future Baseline	Cottam Parcels C1-C3*	Cottam Cable Route Corridor**		
				HGVs	LGVs	Construction Staff Vehicle Movements
A1500	Low Sensitivity	4,216	+96	+32	+32	+80
A15	Low Sensitivity	13,559	+582	+32	+32	+80
A631	Low Sensitivity	5,488	+66	+32	+32	+80
School Lane	Very Low Sensitivity	44	+0	+16	+16	+40
A156	Low Sensitivity	5,967	+0	+32	+32	+80
B1398	Low Sensitivity	3,147	+0	+32	+32	+80
Cow Lane	Very Low Sensitivity	91	+0	+32	+32	+80

Network	Link Sensitivity	Future Baseline	Cottam Parcels C1-C3*	Cottam Cable Route Corridor**		
				HGVs	LGVs	Construction Staff Vehicle Movements
Fillingham Lane	Very Low Sensitivity	173	+0	+32	+32	+80
B1241	Medium Sensitivity	2,585	+0	+32	+32	+80
Cottam Road	Very Low Sensitivity	1,109	+0	+32	+32	+80
Headstead Bank	Low Sensitivity	179	+0	+32	+32	+80

*taken from Table 14.16 of the Cottam Solar Project ES (Ref. 18-8).

**taken from Section 5.19 and 6.41 of Appendix 14.1: Transport Assessment of the Cottam Solar Farm Project ES (Ref. 18-8).

Gate Burton Energy Park

18.17.48 The cumulative impact assessment of the Gate Burton Energy Park includes the considerations set out within the updated Environmental Statement submitted during the examination period in October 2023, Transport Assessment (February 2023) and the Outline PRow Management Plan (Revision 2, October 2023), it should be noted these documents were considered to be the latest to date and available to the public domain when writing this cumulative chapter in March 2024.

18.17.49 Chapter 13: Transport and Access of the Gate Burton Energy Park was prepared by AECOM and updated during the examination period in October 2023 (Ref. 18-9). The transport study area is shown on Figure 13.1 and includes the A156, the A1500 and the B1241.

18.17.50 Gate Burton Energy Park consists of one site to the south of Gainsborough and is expected to be constructed over a 24 to 36-month period, between 2025 and 2027, with operation commencing in 2028. Therefore, there is likely to be some overlap which has been considered below as the proposed peak of construction phase is set to occur in 2026.

18.17.51 Gate Burton Energy Park is proposed to be accessed from the A156 with smaller secondary access points located off Kexby Lane (north and south) and Marton Road. The cumulative assessment focusses on all trips relating to the Solar and Energy Storage Park and the Grid Connection Corridor. A summary of the trips is set out below and further details relating to the proposed access point(s) are provided within the Gate Burton Energy Park ES (Ref. 18-9).

18.17.52 The construction vehicle routing to/ from the Solar and Energy Storage Park is proposed via the A156 (from the north and south) but trips associated with the scheme are also expected on the A159, A631, A1500, A1133, A57 and some minor roads (including Kexby Lane and Cowdale Lane). Therefore,

trips related to the site would be expected to utilise parts of the highway network located within the Scheme's Study Area.

18.17.53 As detailed in Chapter 2-B: Grid Connection Construction Method Statement and Appendix 13-D: Transport Assessment of the ES for Gate Burton Energy Park (Ref. 18-9), the Grid Connection Corridor for the scheme is 7.5 km in length and is expected to be built out over a 24 to 36-month construction period. Eleven Cable Route Corridor accesses are proposed and construction vehicles will be distributed across multiple accesses per day during the construction period.

18.17.54 The construction vehicle routing across the highway network for the Cable Route Corridor can be found in Figure 13-3 of the Gate Burton Energy Park ES (Ref. 18-9).

Construction Trips – Solar and Energy Storage Park

18.17.55 Based on Appendix 13-D: Transport Assessment of the ES (dated January 2023 (Ref. 18-9)) for the Gate Burton Energy Park, there is expected to be a daily peak of 400 construction staff, 30 LGVs and 60 HGVs associated with the Solar and Energy Storage Park. The associated vehicle trips will be split across the four access points with the assumption of 244 vehicle arrivals and 244 vehicle departures each day (55% of workers will arrive/ depart via shuttle bus and 45% will travel by car with an average car occupancy of 1.3).

18.17.56 As mentioned above, the A1500 and the A156 form the only links which pass through both Principal Site transport study areas for the Scheme and Gate Burton Energy Park. The A1500 and A156 have therefore been reviewed further to identify any significant cumulative effects on transport and access receptors. The A15 and A631 have also been reviewed for completeness, given that these fall within the Scheme's Study Area and additional construction vehicle trips are expected on these parts of the network as a result of both schemes.

18.17.57 The A1500 has been assigned a low level of sensitivity and the A156 (to the north of Kexby Lane) has been assigned a medium level of sensitivity within the Gate Burton Energy Park ES. The following is identified within Chapter 13: Transport and Access (Ref. 18-9):

- a. Table 13-13 identifies that an additional 124 daily two-way traffic movements are forecast on the A1500 Till Bridge Lane during the peak construction phase of Gate Burton Energy Park. This equates to a 2.6% increase in total traffic flows compared to future baseline traffic flows (2026).
- b. Table 13-13 identifies that an additional 318 daily two-way traffic movements are forecast on the A156 (worst-case section to the north of the A1500) during the peak construction phase of Gate Burton Energy Park. This equates to a 3.2% increase in total traffic flows compared to future baseline traffic flows (2026).
- c. Figures 29 and 30 of Annex A of Appendix 13-D: Transport Assessment of the Gate Burton Energy Park ES (Ref. 18-9) identify that the scheme could result in a maximum of 124 additional daily two-way traffic

movements on the A15 (assuming that all trips on the A1500 to the west would use the A15) and a maximum of 78 additional daily two-way traffic movements on the A631 (to the east of both the A156 and Springthorpe Road, assuming all trips on the B1241 to the south would use the A631).

Construction Trips – Grid Connection Corridor

18.17.58 Based on Chapter 2-B: Grid Connection Construction Method Statement and Appendix 13-D: Transport Assessment of the ES for Gate Burton Energy Park (Ref. 18-9), the following trips associated with the Grid Connection Corridor will be distributed across multiple accesses per day during the construction period;

- a. 12 HGV deliveries (24 two-way daily vehicle movements);
- b. 16 HV deliveries (32 two-way daily vehicle movements); and
- c. 25 construction staff travelling from the Solar and Energy Storage Park to the Grid Connection Corridor via a single minibus service (equating to two two-way daily vehicle movements).

18.17.59 To provide a worst-case assessment, 100% of the above trips have been distributed across the A1500, A156, A15, A631, Cottam Road and Headstead Bank which are within the Scheme’s Study Area.

Construction Trips – Solar and Energy Storage Park and Grid Connection Corridor Combined

18.17.60 The peak daily construction traffic flows as a result of the Gate Burton Energy Park, based on the information contained within Chapter 13: Transport and Access of the Gate Burton Energy Park ES (Ref. 18-9), are summarised in **Table 18-25** below. The lowest future baseline traffic flows recorded on each link (which are the most robust in terms of identifying proportional changes) have been taken from **Table 16-17** of **Chapter 16: Transport and Access** of this ES [EN010142/APP/6.1]. The assessment of the Gate Burton Energy Park cumulatively with the Scheme and the other cumulative developments considered within this assessment is presented within **Table 18-27**.

Table 18-25: The Gate Burton Energy Park Peak Daily Construction Traffic Flows (Two-Way)

Network	Link Sensitivity	Future Baseline	Gate Burton Energy Park*	Gate Burton Grid Connection Corridor**		
				HGVs	LGVs	Construction Staff Vehicle Movements
A1500	Low Sensitivity	4,216	+124	+24	+32	+2
A156	Low Sensitivity	5,967	+318	+24	+32	+2

Network	Link Sensitivity	Future Baseline	Gate Burton Energy Park*	Gate Burton Grid Connection Corridor**		
				HGVs	LGVs	Construction Staff Vehicle Movements
A15	Low Sensitivity	13,559	+124	+0	+0	+0
A631	Low Sensitivity	5,488	+78	+24	+32	+2
Cottam Road	Very Low Sensitivity	1,109	+0	+24	+32	+2
Headstead Bank	Low Sensitivity	179	+0	+24	+32	+2

*taken from the Gate Burton Energy Park ES (Table 13-13 and Figures 29 and 30 of Annex A of Appendix 13-D: Transport Assessment (Ref. 18-9))

**taken from Section 6.2.19-6.2.24 of Appendix 13-D: Transport Assessment of the Gate Burton Energy Park ES (Ref. 18-9))

Glentworth Oil Extraction Site

- 18.17.61 Igas Energy Plc were granted planning permission in February 2024 for the construction of a new well site, access track and other ancillary developments to the west of the existing Glentworth-K Oil Production Site, off Northlands Road, Glentworth (Ref. 18-12).
- 18.17.62 The Transport Statement (TS) which informs the planning application for the Glentworth Oil Extraction Site was prepared by BSP consulting in November 2022 (Ref. 18-12). The proposed development is shown on Figure 2.2 of the TS and the transport study area includes Northlands Road, Kexby Road, the B1398 (Middle Street) and the A631.
- 18.17.63 The Glentworth Oil Extraction Site consists of one site to the north-east of Glentworth and is expected to be constructed in seven phases over a maximum of 21 years. Although the expected date for the start of the construction period is not provided, there is likely to be some overlap with the Scheme and as the site is located within the immediate vicinity of the Scheme's Order limits, the potential for cumulative effects has been considered in the following sections.
- 18.17.64 Glentworth Oil Extraction Site is proposed to be accessed via Northlands Road. Construction vehicle routing to/ from the site is proposed via the B1398 (Middle Street), Kexby Road and Northlands Road. Widening and upgrading of the existing farmers track to the north of the site into a haul road suitable for HGVs is proposed, as well as the construction of passing bays on Northlands Road and Kexby Road. Therefore, trips related to the site would be expected to utilise parts of the highway network located within the Scheme's Study Area.

Construction Trips

- 18.17.65 Based on Table 5.1 in Chapter 5 of the TS for the Glentworth Oil Extraction Site (Ref. 18-12), there is expected to be a worst-case daily peak of 200 two-way traffic movements as a result of the scheme, including 100 two-way HGVs. Detailed trip distribution is not included in the TS and therefore, for robustness, 100% of these trips have been assigned to the A15, A631 and B1398 to review worst-case cumulative impacts within the Scheme's Study Area. No cumulative effects are expected across the remainder of the highway network within the Scheme's Study Area as a result of the Glentworth Oil Extraction Site.
- 18.17.66 The peak daily construction traffic flows on the A15, A631 and B1398 as a result of the Glentworth Oil Extraction Site, based on the information contained within Table 5.1 of the TS for the Glentworth Oil Extraction Site (Ref. 18-12) are summarised in **Table 18-26** below. The lowest future baseline traffic flows recorded on each link (which are the most robust in terms of identifying proportional changes) have been taken from **Table 16-17 of Chapter 16: Transport and Access** of this ES [EN010142/APP/6.1]. The assessment of the Glentworth Oil Extraction Site cumulatively with the Scheme and the other cumulative developments considered within this assessment is presented within **Table 18-27**.

Table 18-26: Glentworth Oil Extraction Site Peak Daily Construction Traffic Flows (Two-Way)

Network Link	Sensitivity	Future Baseline	Glentworth Site*
A15	Low Sensitivity	13,559	+200
A631	Low Sensitivity	5,488	+200
B1398	Low Sensitivity	3,147	+200

**taken from Table 5.1 of the Glentworth Oil Extraction Site TS (Ref. 18-12)*

Total Cumulative Traffic Flows

- 18.17.67 A summary of the total worst-case cumulative traffic flows based on the schemes reviewed above has been set out in **Table 18-27** below. It should be noted that the identified cumulative traffic flows will only occur if the peak construction phases for all projects overlap and the Cable Route Corridors are constructed separately, which is considered to be very unlikely.

Table 18-27: Total Worst-Case Cumulative Peak Daily Construction Traffic Flows (Two-Way)

Network	Link Sensitivity	Future Baseline	Total Cumulative	Future Base + Total Cumulative	Total Cumulative Increase (%)	Schemes
A1500 (ATC 26)	Low Sensitivity	4,216	1,662	5,877	39%	Tillbridge Solar Project West Burton Solar Project Cottam Solar Project Gate Burton Energy Park
A156 (ATC 28)	Low Sensitivity	5,967	1,238	7,205	21%	Tillbridge Solar Project West Burton Solar Project Cottam Solar Project Gate Burton Energy Park
A15 (ATC 9)	Low Sensitivity	13,559	2,130	15,689	16%	Tillbridge Solar Project West Burton Solar Project Cottam Solar Project Gate Burton Energy Park Glentworth Oil
A631 (ATC 8)	Low Sensitivity	5,488	1,845	7,332	34%	Tillbridge Solar Project Cottam Solar Project Gate Burton Energy Park Glentworth Oil
School Lane (ATC 14)	Very Low Sensitivity	44	180	224	409%	Tillbridge Solar Project Cottam Solar Project
B1398 (ATC 7)	Low Sensitivity	3,147	915	4,062	29%	Tillbridge Solar Project Cottam Solar Project Glentworth Oil

Network	Link Sensitivity	Future Baseline	Total Cumulative	Future Base + Total Cumulative	Total Cumulative Increase (%)	Schemes
Cow Lane (ATC 16)	Very Low Sensitivity	91	319	411	349%	Tillbridge Solar Project Cottam Solar Project
Fillingham Lane (ATC 18)	Very Low Sensitivity	173	630	803	364%	Tillbridge Solar Project Cottam Solar Project
B1241 (ATC 22)	Medium Sensitivity	2,585	630	3,215	24%	Tillbridge Solar Project Cottam Solar Project
Cottam Road (ATC 30)	Very Low Sensitivity	1,109	1,060	2,169	96%	Tillbridge Solar Project West Burton Cottam Gate Burton
Headstead Bank (ATC 31)	Low Sensitivity	179	709	888	395%	Tillbridge Solar Project West Burton Solar Project Cottam Solar Project Gate Burton Energy Park

- 18.17.68 Given the uncertainty around the likelihood of construction of the cumulative schemes overlapping, a high-level review of impacts on road link receptors has been undertaken, based on percentage changes in daily two-way traffic flows, to assess effects on driver delay, severance, pedestrian delay, non-motorised user amenity, fear and intimidation and road safety.
- 18.17.69 The results in **Table 18-27** show that the total worst-case cumulative traffic flows fall below the 30% impact threshold defined by Rule 1 of the IEMA Guidelines (Ref. 18-14) on the A156, A15 and B1398 Middle Street.
- 18.17.70 On the A1500 and A631, the magnitude of impact is considered to be Slight. Much of this impact is due to the trips associated with the construction of the individual Cable Route Corridors for the four solar schemes. The Cable Route Corridor construction trips for the four solar schemes will be split across the respective accesses depending on the section of the Cable Route Corridor that is being installed. Therefore, the accesses which require traffic to be distributed along the A1500 and A631 will not be used by all four schemes at exactly the same time and will not be used every day during the construction period.
- 18.17.71 On School Lane, Cow Lane, Fillingham Lane, Cottam Road and Headstead Bank, the magnitude of impact is considered to be Substantial. On the B1241 the magnitude of impact is Slight. Such large percentage increases on School Lane, Cow Lane, Fillingham Lane and Headstead Bank are due to the low baseline flows recorded on these parts of the network. It should also be noted that the number of vehicles associated with the Scheme utilising Cottam Road is high because in order to minimise impacts on the village of Rampton, all the Cable Route Corridor construction vehicles which would have utilised Torksey Ferry Road have been distributed along this road.
- 18.17.72 Cow Lane, Fillingham Lane, the B1241, Cottam Road and Headstead Bank will only be utilised for the construction of the Cable Route Corridors in the vicinity of the respective accesses, which will occur for a short period during the construction phase. The Cable Route Corridor trips for the four solar schemes will be split across the respective accesses depending on the section of the Cable Route Corridor that is being installed. Therefore, the accesses which require traffic to be distributed along School Lane, Cow Lane, Fillingham Lane, the B1241, Cottam Road and Headstead Bank will not be used by all four schemes at exactly the same time and will not be used every day during the construction period. Therefore, it is highly unlikely that all five schemes will utilise these parts of the network at exactly the same time and a large number of the trips will only occur for a short period during the construction phase.
- 18.17.73 Although the cumulative increase in traffic flows on School Lane, Cow Lane, Fillingham Lane, the B1241, Headstead Bank and Cottam Road is greater than 30% and noteworthy, the effects will be temporary in nature and will occur on receptors with a low or very low sensitivity. The significance category is therefore **Slight Adverse (not significant)**, as defined in Table 18-6. The effect category on other links is **Neutral (not significant)**.
- 18.17.74 In addition, cumulative effects may occur on PRow impacted by the solar DCOs and the Scheme. In all cases it is considered that any cumulative

effects on PRow users would be avoided through the implementation of the **Framework Construction Traffic Management Plan (CTMP) [EN010142/APP/7.11]**.

18.17.75 Temporary full closures are only anticipated to be required on minor unclassified roads with relatively low traffic flows, and it is not expected that there would be multiple closures at the same time or in close proximity to each other, as provided within the **Framework Construction Traffic Management Plan (CTMP) [EN010142/APP/7.11]**. As both the partial and full temporary closures will be for very short periods within the construction phase and in all circumstances alternative routes will be provided, the cumulative effects on driver and passenger delay and severance are considered **not significant**.

Shared Cable Route Corridor Mitigation

18.17.76 It is proposed that a Joint Construction Traffic Management Plan (CTMP) is prepared between the Scheme and the other solar DCOs (West Burton Solar Project, Cottam Solar Project and Gate Burton Energy Park) post-consent to manage and mitigate cumulative effects, once further details are known on project timeframes and the approach for the shared Cable Route Corridor.

18.17.77 At present, there is no certainty that all of the schemes will be consented and therefore that a Joint CTMP would be required. If they are all consented, they may be subject to different requirements on construction traffic or timescales, which may make production of one document across all projects challenging. No single party has authority over another and each DCO only controls the activities for that project. Notwithstanding the above, it is the developers' intention to together develop a Joint CTMP and this approach has been agreed between the parties.

18.17.78 The Joint CTMP would support implementation of shared mitigation measures such as joint traffic management, joint consultation with Lincolnshire and Nottinghamshire County Council traffic officers, combined vehicle access and routeing plans, shared use of construction compounds, taking a holistic approach to construction traffic planning and management as well as considering the cumulative impact on PRow.

18.17.79 Further information is provided within the **Joint Report on the Interrelationship with other National Infrastructure projects [EN010142/APP/7.6]** submitted with this DCO application.

Cumulative Effects During Operation

18.17.80 Cumulative effects during the operational phase of the Scheme have been scoped out of this assessment as the number of trips associated with the Scheme is minimal and therefore, the Scheme's contribution to any cumulative effects would be limited.

18.17.81 Whilst components of the Scheme may need to be replaced during the operational phase, this would be programmed in stages over a much longer period than the construction phase and therefore any overlap with replacements at the other solar sites is unlikely. The **Framework OEMP [EN010142/APP/7.9]** sets out the requirement to agree a maintenance and

replacement schedule with the local authority, which would limit operational traffic movements from the Scheme.

18.17.82 **No significant cumulative effects** are therefore expected during operation.

Cumulative Effects During Decommissioning

18.17.83 As the Scheme has an operational life of 60 years, it is not possible to state for certain which developments would be constructed or decommissioned at the same time as the Scheme is being decommissioned. However, it is considered likely that the other solar DCOs would be decommissioned around the same time as the Scheme. As such, the effects of decommissioning are likely to be similar to those or less than during construction.

18.18 Other Environmental Topics

Glint and Glare

18.18.1 The assessment presented in **Chapter 17: Other Environmental Topics** of this ES [EN010142/APP/6.1] identified that there will be no receptors which will experience significant effects as a result of the Scheme. Additionally, it is expected that the cumulative solar DCOs will be designed to ensure that there will be effective screening to prevent glint and glare effects from the individual proposed developments, as set out within their respective applications (Ref. 18-7, Ref. 18-8, Ref. 18-9). Therefore, **no cumulative effects** are considered to arise for glint and glare.

Ground Conditions

18.18.2 The assessment presented in **Chapter 17: Other Environmental Topics** of this ES [EN010142/APP/6.1] identified that there will be no significant effects in relation to ground conditions as a result of the Scheme, with mitigation in place as set out within the **Framework CEMP [EN010142/APP/7.8]**, **Framework OEMP [EN010142/APP/7.9]** and **Framework DEMP [EN010142/APP/7.10]**. Similarly, provided that the requirements of relevant policies and legislation relating to land contamination and remediation are integrated within the design and appropriate mitigation measures are applied during the construction, operation and decommissioning phases of each and every cumulative scheme (in accordance with their own management plans, as set out in their respective applications (Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13, Ref. 18-22)), it is considered that the cumulative effect on ground conditions will be **not significant**.

Major Accidents and Disasters

18.18.3 The assessment presented in **Chapter 17: Other Environmental Topics** of this ES [EN010142/APP/6.1] identified that the risks derived from flooding, fire, road and rail accidents, aircraft disasters, flood defence failure, utilities failure, mining and extractive industry and plant disease are considered in the assessment of a number of topics and management plans presented in the ES and other DCO Application documents. With mitigation in place, no

residual significant effects with regards to major accidents and disasters were identified in relation to the Scheme.

- 18.18.4 The shortlisted cumulative schemes located in close proximity to the Order limits are predominantly residential developments, other solar farms and battery storage around Cottam National Grid Substation. These may either introduce new receptors for major accident and disaster hazards and/ or introduce new sources of hazards that the Scheme might be susceptible to.
- 18.18.5 Increased traffic during construction and decommissioning phases of the Scheme in combination with other developments could result in a greater risk of road accidents. This is considered further within Section 18.17 of this chapter.
- 18.18.6 Provided that the requirements of relevant policies and legislation relating to safety and major accidents and disaster risks are integrated within the design and appropriate mitigation measures are applied during the construction, operation and decommissioning phases of each and every cumulative scheme, as set out in their respective applications (e.g. Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13, Ref. 18-22), it is considered that the cumulative effect with regards to major accidents and disasters will be **not significant**.

Telecommunications, Television Reception and Utilities

- 18.18.7 The Scheme has been assessed to have no significant residual effects on telecommunication, television or utilities, as presented in **Chapter 17: Other Environmental Topics** of this ES [EN010142/APP/6.1]. It is expected that the other developments included within the cumulative schemes shortlist would also have no effect on telecommunications and television reception and would adhere to the same mitigation to reduce the risk of damaging utilities, as set out in their respective applications (e.g. Ref. 18-7, Ref. 18-8, Ref. 18-9, Ref. 18-13, Ref. 18-22). All developments will need to be managed through a CEMP and would include mitigation measures to reduce the risk of damaging utilities during construction. Therefore, **no cumulative effects** are expected on telecommunications, television reception, or utilities.

Materials and Waste

- 18.18.8 The assessment presented in **Chapter 17: Other Environmental Topics** of this ES [EN010142/APP/6.1] identified that there will be no significant effects in relation to Materials and Waste as a result of the Scheme.
- 18.18.9 The cumulative effects of operational replacement and decommissioning of solar farm specific elements (e.g. solar panels) are considered separately at a high level and the ZoI for cumulative effects associated with solar farm specific wastes is Lincolnshire.
- 18.18.10 For all materials and waste, a detailed cumulative effects assessment for non-solar farm specific wastes was not undertaken at pre-application stage since:
- As part of their planning function, Waste Planning Authorities (WPAs) are required to ensure that enough land is available to accommodate

facilities for the treatment of all waste arising in the area, either within the WPA area, or through export to suitable facilities in other areas;

- b. Minerals Planning Authorities (MPAs) are similarly required to ensure an adequate supply of minerals, sufficient to meet the needs of national and regional supply policies, and local development needs;
- c. In preparing their waste management strategies, the WPAs already take into account waste generation at the regional and sub-regional scale, since these are the figures which are then used for determining the need for waste facilities. The landfill void capacity remaining (which is used to evaluate the effects of the Scheme) already takes into account the cumulative effects of waste generated by other developments, and hence a separate cumulative impact assessment is not required for waste. It is therefore not necessary or feasible for each development within the region to, in effect, duplicate the function of the WPA as part of the EIA process; and
- d. It is assumed that each of the cumulative developments will also be considering and implementing the waste hierarchy as per requirements set out in The Waste (England and Wales) Regulations 2011 (Ref. 18-17).

18.18.11 A quantitative cumulative waste assessment of the Scheme was undertaken in response to the relevant representations received from the Lincolnshire County Council and the Environment Agency and was submitted as **Appendix A** of the **Applicant's Response to Relevant Representations [REP1-028]** as part of Deadline 1 of the examination stage. This assessment assumed a 'realistic worst case' of a 70% recovery rate, based on current and likely future recovery rates, where recovery is defined as reuse, recycling and recovery e.g. energy from waste. The assessment concluded that under the absolute worst case assessment (assuming zero recycling/recovery), cumulative impacts would be significant. Under the realistic worst case (70% recovery), cumulative impacts would be not significant.

18.18.12 It is likely that the solar panel waste generated by the Scheme during operation and decommissioning would be managed by specialist regional or national facilities, and that such facilities would be developed over the operational period in response to demand generated by the UK-wide solar panel industry. The capacity of such facilities is not expected to be influenced by other non-solar farm projects in the surrounding area because the facilities will only be managing solar panel waste.

18.18.13 Private sector waste companies will develop these facilities to respond to market demands. Current solar panel waste generation is low, so there is little demand for facilities, hence the limited available capacity presently. Therefore, it is expected that facilities which reuse, recycle, or recover end-of-life solar panels will be developed as the quantities of this waste stream increase. The Waste Electrical and Electronic Equipment (WEEE) Regulations (Ref. 18-18) place obligations on those who place solar panels on the market to finance the costs of collection, treatment, recovery and environmentally sound disposal; and the landfill tax strongly incentivise reuse, recycling and recovery.

- 18.18.14 As stated by the government, the 'Proximity Principle', indicates that it is neither necessary or realistic to require capacity to be available within Lincolnshire, either now or in the future, to recycle all the solar panel waste that may be generated by solar farms in the county.
- 18.18.15 It is assumed that specialist regional or national facilities would be in place at the time of decommissioning, and these would be developed in response to demand generated by the UK-wide solar panel industry and waste solar panels would be reused, recycled, or recovered and not disposed of to landfill.
- 18.18.16 The **Framework OEMP [EN010142/APP/7.9]** and the **Framework DEMP [EN010142/APP/7.10]** set out that the Applicant is committed to maximise recycling and reuse of the Scheme components at the end of their life. There are already organisations around the UK and Europe specialising in solar recycling, such as PV Cycle and the European Recycling Platform. They are working with solar developers to minimise electrical waste and recycling old panels in line with the WEEE Regulations (Ref. 18-18). In addition, companies like SECONDSOL offer a marketplace service for the purchase and selling of second-hand PV panels and equipment, where there is still a good level of life in the equipment remaining. Panels that have developed faults or damage can also be refurbished and repowered by specialist companies and the manufacturers and resold or reinstalled. The Applicant will adhere with the industry best practice outlined in Solar Power Europe's Lifecycle Quality Best Practice Guidance (Ref. 18-19).
- 18.18.17 Since waste solar panels are unlikely to be disposed of to landfill, then in accordance with the assessment methodology in **Chapter 17: Other Environmental Topics** of this ES **[EN010142/APP/6.1]**, the effects are anticipated to be not significant. Therefore, **no significant cumulative materials and waste effects** have been identified for the Scheme.

Electric and Electro-Magnetic Fields

- 18.18.18 As set out within **Chapter 17: Other Environmental Topics** of this ES **[EN010142/APP/6.1]**, impacts due to electric and electro-magnetic fields would not be perceptible beyond 10m of the cable alignment. Impacts on residential and ecological receptors (i.e. fish) have been designed out. Any impacts on PRoW users would be transient in nature and not significant. The solar DCOs that share the cable corridor with the Scheme would not change the conclusions of this assessment, as such **no significant cumulative effects** have been identified.

18.19 References

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- Ref. 18-2. The Planning Inspectorate (2015), Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects.
- Ref. 18-3. HMSO (2015) The Town and Country Planning (Development Management Procedure) (England) Order 2015.
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- Ref. 18-5. DEFRA (2022). Agricultural Land Use in England at 1 June 2022. Available at <https://www.gov.uk/government/statistics/agricultural-land-use-in-england> [Accessed 25 February 2024]
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- Ref. 18-9. Gate Burton Energy Park Limited (2023) DCO Application. Available at: <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN010131/documents> [Accessed 25 February 2024]
- Ref. 18-10. Institute of Environmental Management and Assessment (IEMA) (2022). IEMA Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance.
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- Ref. 18-13. IGas Energy PLC (2022) Glentworth Oil planning application. Available at: <https://lincolnshire.planning-register.co.uk/Planning/Display?applicationNumber=PL%2F0135%2F22> [Accessed 15 March 2024]

- Ref. 18-14. Institute of Environmental Management and Assessment (IEMA) Guidelines (2023) Environmental Assessment of Traffic and Movement. Lincoln: IEMA.
- Ref. 18-15. EDF Energy (2020) West Burton C Power Station Environmental Statement. Available at: <https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN010088> [Accessed 15 March 2024]
- Ref. 18-16. National Grid (2023) North Humber to High Marnham Energy Grid Project Background Document. June 2023.
- Ref. 18-17. HMSO (2011) The Waste (England and Wales) Regulations 2011. Available at: <https://www.legislation.gov.uk/ukxi/2011/988/contents> [Accessed 15 March 2024]
- Ref. 18-18. HMSO (2013) Waste Electrical and Electronic Equipment (WEEE) Regulations 2013. Available at: <https://www.legislation.gov.uk/ukxi/2013/3113/contents> [Accessed 15 March 2024]
- Ref. 18-19. Solar Power Europe (2021) Lifecycle Quality Best Practice Guidance. Version 1.0.
- Ref. 18-20. Department for Environment, Food and Rural Affairs (2023). Agricultural land use in England. Available at: <https://www.gov.uk/government/statistics/agricultural-land-use-in-england> (Accessed: 14 February 2024)
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