Heckington Fen Solar Park

EN010123

Chapter 19: Summary

Applicant: Ecotricity (Heck Fen Solar) Limited

Document Reference: 6.1.19
Pursuant to: APFP Regulation 5(2)(a)
Deadline 2: 7th November 2023
Document Revision: 3

November 2023

Track Changes

Planning Act 2008

CHAPTER 19: SUMMARY

Document Properties		
Regulation Reference	Regulation 5(2)(a)	
Planning Inspectorate Scheme Reference	EN010123	
Application Document Reference	6.1.19	
Title	Chapter 19: Summary	
Prepared By	Heckington Fen Energy Park Project Team (Pegasus)	
Version History		
Version	**Date**	**Version Status**
Rev 1	February 2023	Application Version
Rev 2	August 2023	Change Application
Rev 3	November 2023	Deadline 2

Table of Contents:

List of Tables:

19 SUMMARY

19.1.1 This chapter of the Environmental Statement (ES) provides a summary of the various technical assessments which have been undertaken as part of the EIA (Environmental Impact Assessment) process.

19.1.2 A summary of all the likely significant effects, additional mitigation and residual effects assessed in the technical chapters of this ES are presented in this chapter within relevant tables for construction, operation and decommissioning.

19.1.3 Within this chapter, it also presents a summary of the cumulative effects (in-combination effects of the Proposed Development and other developments) that have been assessed within each technical chapter.

19.1.4 Mitigation measures are identified and described in further detail within the individual topic chapters (**Chapters 6 – 18** (document reference 6.1.6- 6.1.18)) of this ES. These mitigation measures have been incorporated into the Proposed Development and/or control documents, as agreed with the project team and stakeholders (where necessary), to control residual effects.

19.2 SUMMARY OF RESIDUAL EFFECTS

19.2.1 The residual effects are analysed as part of the Proposed Development. The residual effects are defined as those effects that remain following the implementation of mitigation measures. Residual effects and mitigation measures are discussed in full in the relevant technical chapters of this ES (**Chapters 6 to 18**) (document reference 6.1.6-6.1.18)

19.2.2 Each technical chapter contains detailed consideration of both the beneficial and adverse residual effects identified as likely to arise from the Proposed Development. The criteria applied to define the significance of residual effects are outlined within **Chapter 2: EIA Methodology and Public Consultation** (document reference 6.1.2) of this ES, with further detail provided within the individual technical chapters.

19.2.3 The residual effects listed within the technical chapters of this ES (**Chapters 6 to 18**) are described with reference to the scale of effect (i.e., moderate or major) and whether this is significant or not, and the nature of the effect (i.e., adverse, negligible or beneficial). Residual effects assigned a rating of 'major' or 'moderate' are considered in general as significant and are identified in this summary chapter.

19.2.4 Where technical chapters have deviated from this standard methodology, this is explained in the respective chapters and justification for the reason provided (for example to align with industry-standard guidance for that discipline). This is pertinent to **Chapter 6: Landscape and Visual** (document reference 6.1.6) and **Chapter 7: Residential Visual Amenity** (document reference 6.1.7), whereby both methodologies only assess major effects as significant.

19.2.5 The design of the Proposed Development has been an iterative process and developed with consultation with statutory and non-statutory consultees. The design parameters have been considered in detail by technical chapter authors and the results of the assessments are reported in the individual topic chapters of the ES. A number of measures have been implemented within the design of the Proposed Development to reduce adverse environmental effects, including landscape design to create habitat and screen views of the Proposed Development.

19.2.6 A summary of the identified significant residual effects for each topic are presented in **Table 19.1** for the construction phase, **Table 19.2** for the operational phase and **Table 19.3** for the decommissioning phase. A description of the effect on the resource or receptor, initial significance of effect, proposed mitigation measure and remaining residual effect with mitigation measure implemented is outlined in **Table 19.1-19.3.**

19.2.7 Prior to mitigation, significant effects are anticipated in relation to:

- Landscape and Visual;
- Residential Amenity;
- Climate Change;
- Socio-Economics;
- Cultural Heritage;
- Noise and Vibration;
- Glint and Glare; and
- ~~Land Use and Agriculture.~~

19.2.8 Prior to the implementation of the proposed mitigation measures, significant effects are not anticipated in relation to the following topics, and these are therefore not discussed further in this section of the chapter:

- ~~Residential Amenity;~~
- Ecology and Ornithology;
- Hydrology, Hydrogeology and Flood Risk and Drainage;
- ~~Cultural Heritage;~~
- ~~Noise and Vibration~~;
- Transport and Access;
- Air Quality;
- ~~Glint and Glare~~;
- Land Use and Agriculture, and
- Miscellaneous Issues.

19.2.9 The **Mitigation Schedule** (document reference 7.2) sets out the details of all embedded and additional mitigation and how this is secured through the DCO process.

Table 19.1: Summary of Significant Effects, Mitigation Measures and Residual Effects of the Proposed Development during the Construction Phase

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
Landscape and Visual			
Tree and hedgerow resource within the Energy Park. (Additional hedgerow and hedgerow tree planting. Increase in quantum.)	Major (beneficial)	None required.	Major beneficial **(significant)**
PRoW (New permissive path, reconnecting the Public Footpath Heck/15/1)	Major (beneficial)	None required.	Major beneficial **(significant)**
The Fens Regional Landscape Character Type and associated Fenland Landscape Character Sub-Area-limited to the Application Site and its immediate context of approx. 500m only. (Change to landscape character)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
East Heckington (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Sidebar Lane (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Railway Line (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Public Footpath SKym/2/1 (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Public Footpath Heck/15/1 (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Public Footpath Swhd/14/1 (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
Viewpoint 1 Public Footpath SKym/2/1 and Sidebar Lane overbridge at Head Dike (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Viewpoint 2 Public Footpath Heck/15/1, near the north eastern edge of the Energy Park (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Viewpoint 4 Sidebar Lane, near telecommunication mast (Change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Viewpoint 14 Junction of Timm's Drove and Tilebarn Lane, West Low Grounds (Change to views)	Major (adverse)	Mitigation by Design	Major **(significant)**
Viewpoint 15 Junction of Bicker Drove and Vicarage Drove along Mill Drain (Change to views)	Major (adverse)	Mitigation by Design	Major adverse (**significant**)
LT A Reclaimed Fen and more specifically its LCA A1 Holland Reclaimed Fen (Cumulative effect, change to landscape character)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Viewpoint 15 Junction of Bicker Drove and Vicarage Drove along Mill Drain (Cumulative effect, change to views)	Major (adverse)	Mitigation by Design	Major adverse **(significant)**
Residential Amenity			
No significant residual effects from residential amenity are predicted during construction of the Proposed Development.			
Ecology and Ornithology			
No significant residual effects to ecological receptors are predicted during construction of the Proposed Development.			

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
Significant effects are recognised at a 'local level' for: • Woodland However, in terms of EIA significance, 'local level' effects are not attributed as EIA significant effects and are therefore Not Significant.			
Hydrology, Hydrogeology, Flood Risk and Drainage			
No significant residual effects on the water environment or flood risk are predicted during construction of the Proposed Development.			
Cultural Heritage			
Buried remains of Mesolithic or Neolithic pits	Moderate/Major (adverse)	Archaeological strip map sample excavation in G15	Minor harm (archaeology is a finite resource and so harm cannot be entirely mitigated) (**not significant**)
Buried remains of Roman saltern	Moderate/Major (adverse)	Archaeological strip map sample excavation in G23	Minor harm (archaeology is a finite resource and so harm cannot be entirely mitigated) (**not significant**)
No significant residual effects on cultural heritage are predicted during construction, once mitigation measures are implemented, for ~~of~~ the Proposed Development.			
Socio-Economic			
Employment (Increase in employment in the construction sector)	Moderate (beneficial)	None required	Moderate beneficial **(significant)**
Gross value added. (Increased contribution to economic output)	Moderate (beneficial)	None required	Major beneficial **(significant)**
Noise			
Residential/educational receptors	Moderate to Major (adverse)	Minimise extent and effects of trenchless work particularly for night-time HDD; liaise with closest affected residents; interrupt drilling at night or investigate	Minor (**not significant**)

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
		alternative techniques, screening and/or temporary re-housing. Implemented in CEMP.	
No significant residual effects to receptors from noise and vibration once mitigation measures are implemented are predicted during construction of the Proposed Development.			
Climate Change			
No significant residual effects on climate change are predicted during construction of the Proposed Development.			
Transport and Access			
No significant residual effects on receptors of transport and access are predicted during construction of the Proposed Development.			
Air Quality			
No significant residual effects on receptors of air quality are predicted during construction of the Proposed Development.			
Land Use and Agriculture			
~~Loss / sealing of BMV agricultural land during construction~~	~~Moderate (adverse)~~	~~Careful management and soil handling~~	~~Moderate adverse **(significant)**~~
~~Loss / sealing of poorer quality agricultural land during construction~~	~~Moderate (adverse)~~	~~Careful management and soil handling~~	~~Moderate adverse **(significant)**~~
No significant residual effects from land use and agriculture are predicted during construction of the Proposed Development.			
Glint and Glare			
No significant residual effects from glint and glare are predicted during construction of the Proposed Development.			
Miscellaneous Issues			
No significant residual effects from miscellaneous issue including, vulnerability of the Proposed Development to risks of major accidents and disasters, telecommunications, television reception, and utilities, waste, and electric, magnetic and electromagnetic fields are predicted during construction of the Proposed Development.			

Table 19.2: Summary of Significant Effects, Mitigation Measures and Residual Effects of the Proposed Development during the Operational Phase

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
Landscape and Visual			
No significant residual effects to receptors from a landscape and visual aspect are predicted during operation of the Proposed Development.			
Residential Amenity			
Residential Properties (ID5, ID6, ID7, ID8, ID11, 1D14, ID16, ID17, 1D18, 1D20, ID24, ID28, ID 32, ID33) of Appendix 7.2- RVAA Assessment Table (document reference 6.3.7.2/APP-189)	Major (adverse)	Mitigation planting along the perimeter of the Energy Park	Moderate adverse **(not significant)**
No significant residual effects to receptors from a residential visual amenity, once mitigation measures are implemented, ~~aspect~~ are predicted during operation of the Proposed Development.			
Ecology and Ornithology			
No significant residual effects to ecological receptors are predicted during construction of the Proposed Development. Significant effects are recognised at a 'local level' for: • Grasslands; • Boundary habitat; • Brown Hare; • Badger; • Bats; • Breeding Birds; and • Invertebrates However, in terms of EIA significance, 'local level' effects are not attributed as EIA significant effects and are therefore Not Significant.			
Hydrology, Hydrogeology, Flood Risk and Drainage			
No significant residual effects on the water environment or flood risk are predicted during operation of the Proposed Development.			
Cultural Heritage			
No significant residual effects on cultural heritage are predicted during operation of the Proposed Development.			
Socio-Economic			
Business rates	Moderate (beneficial)	None required	Moderate beneficial **(significant)**

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
(Increase in business rates revenue)			
Noise			
No significant residual effects to receptors from noise and vibration are predicted during operation of the Proposed Development.			
Climate Change			
Global atmosphere (Net GHG emissions as a consequence of operation of the Proposed Development)	Moderate (beneficial)	None required	Moderate beneficial **(significant)**
Transport and Access			
No significant residual effects on receptors of transport and access are predicted during operation of the Proposed Development.			
Air Quality			
No significant residual effects on receptors of air quality are predicted during operation of the Proposed Development.			
Land Use and Agriculture			
No significant residual effects from land use and agriculture are predicted during operation of the Proposed Development.			
Glint and Glare			
Road Receptors	Moderate (adverse)	Energy Park site screening	Negligible (**not significant**)
No significant residual effects from glint and glare are predicted during operation, once mitigation measures are implemented, for ~~of~~ the Proposed Development.			
Miscellaneous Issues			
No significant residual effects from miscellaneous issue including, vulnerability of the Proposed Development to risks of major accidents and disasters, telecommunications, television reception, and utilities, waste, and electric, magnetic and electromagnetic fields are predicted during operation of the Proposed Development.			

Table 19.3: Summary of Significant Effects, Mitigation Measures and Residual Effects of the Proposed Development during the Decommissioning Phase

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
Landscape and Visual			
The Fens Regional Landscape Character Type and associated Fenland Landscape Character Sub-Area-limited to the Energy Park and its immediate context of approx. 500m only. (Reverse of adverse landscape character)	Major (adverse)	Mitigation by Design	Major beneficial **(significant)**
Residential Amenity			
No significant residual effects from residential amenity are predicted during decommissioning of the Proposed Development.			
Ecology and Ornithology			
No significant residual effects to ecological receptors are predicted during decommissioning of the Proposed Development. Significant effects are recognised at a 'local level' for: • Invertebrates However, in terms of EIA significance, 'local level' effects are not attributed as EIA significant effects and are therefore Not Significant.			
Hydrology, Hydrogeology, Flood Risk and Drainage			
No significant residual effects on the water environment or flood risk are predicted during decommissioning of the Proposed Development.			
Cultural Heritage			
Buried remains of scattered Roman ditches not previously subject to strip map sample excavation	Moderate/ Major (adverse)	Archaeological watching brief during the removal of ground-mounted infrastructure	Minor harm (archaeology is a finite resource and so harm cannot be entirely mitigated) (**not significant**)
No significant residual effects on cultural heritage are predicted during decommissioning, once mitigation measures are implemented, for ~~of~~ the Proposed Development.			
Socio-Economic			
Employment	Moderate (beneficial)	None required	Moderate beneficial **(significant)**

Receptor/ Receiving Environment of Effect	Significance of Effect	Mitigation	Residual Effect
(Increase in employment in the construction sector)			
Gross value added. (Increased contribution to economic output)	Moderate (beneficial)	None required	Major beneficial **(significant)**
Gross value added. (contribution to economic output)	Moderate (beneficial)	None required	Moderate beneficial **(significant)**
Noise			
No significant residual effects to receptors from noise and vibration are predicted during decommissioning of the Proposed Development.			
Climate Change			
No significant residual effects on climate change are predicted during decommissioning of the Proposed Development.			
Transport and Access			
No significant residual effects on receptors of transport and access are predicted during decommissioning of the Proposed Development.			
Air Quality			
No significant residual effects on receptors of air quality are predicted during decommissioning of the Proposed Development.			
Land Use and Agriculture			
No significant residual effects from land use and agriculture are predicted during decommissioning of the Proposed Development.			
Glint and Glare			
No significant residual effects from glint and glare are predicted during decommissioning of the Proposed Development.			
Miscellaneous Issues			
No significant residual effects from miscellaneous issue including, vulnerability of the Proposed Development to risks of major accidents and disasters, telecommunications, television reception, and utilities, waste, and electric, magnetic and electromagnetic fields are predicted during decommissioning of the Proposed Development.			

~~19.1~~19.3 RESIDUAL EFFECTS CONCLUSIONS

~~19.1.1~~19.3.1 The residual effects (i.e., those that remain following implementation of mitigation measures), which are categorised as moderate or major and therefore considered to be 'likely significant environmental effects' are summarised below.

~~19.1.2~~19.3.2 A number of environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Proposed Development. It is proposed that these will be secured through appropriate requirements and other controls within the DCO application, should this be granted.

Construction Phase

~~19.1.3~~19.3.3 For the construction phase, a number of significant effects relating to landscape and visual receptors and~~,~~ socio-economic receptors ~~and land use and agricultural receptors~~ are identified.

~~19.1.4~~19.3.4 In terms of landscape and visual amenity effects on residential receptors, users of the local PROW network and landscape character, the significant, adverse residual effects are identified during the construction phase. These effects during the construction phase will be temporary, due to the transient nature of the construction works. The construction phase residual effects are due to the changes in surface landform, landcover, presence of construction machinery and the associated activity which is required to implement the Proposed Development.

~~19.1.5~~19.3.5 ~~In terms of Land Use and Agriculture, significant residual effects relate to the potential for loss of sealing of BMV and poorer agricultural land during the installation process of infrastructure relating to the Proposed Development in the construction phase. Overall, there is no significant adverse effect on the agricultural land quality of the Energy Park or grid connection in the Cable Route Corridor~~.

~~19.1.6~~19.3.6 In terms of Socio-Economic residual effects, it is anticipated that significant beneficial effects are expected through increase in local employment from the construction phase of the Proposed Development, and in turn increase in economic output to the local economy from increased employment.

Operational Phase

~~19.1.7~~19.3.7 During the operational phase of the Proposed Development, a significant beneficial effect on the global climate is anticipated through the net GHG emission savings due to the nature of the Proposed Development producing renewable energy and therefore displacing the need for other forms of conventional energy generation that would emit greenhouse gas emissions.

~~19.1.8~~19.3.8 During the operational phase of the Proposed Development, a significant beneficial effect is anticipated on the increased business rates revenue as an important economic contributor to the area. It is estimated that the solar project element of the Proposed Development could generate up to £1.3million per annum in business rates. Over the intended 40-year lifespan of the Proposed Development, business rates generated could total around £29.3million (present value).

Decommissioning Phase

~~19.1.9~~19.3.9 Similar to the construction phase, the presence of site plant and machinery during the decommissioning phase will have significant adverse effects on a number of landscape and visual receptors, albeit this phase is expected to be broadly similar if not slightly quicker than the construction phase, and therefore temporary.

~~19.1.10~~19.3.10 The Energy Park site area upon decommissioning is likely to revert to its current use and be used by the landowner for agricultural operations of their choice and determined by the global markets at that time. It is assumed that established habitats such as hedgerows and woodland would be retained when handed back to landowners. This is not considered a significant beneficial effect, but it is considered important by the Applicant to retain given its ecological and landscape value.

~~19.1.11~~19.3.11 The decommissioning of the Proposed Development is expected to result in a significant beneficial effect on the local economy, as it will generate a similar level of employment as expected during the construction phase.

~~19.2~~19.4 SUMMARY OF INTER-PROJECT CUMULATIVE EFFECTS

~~19.2.1~~19.4.1 This section of the chapter reports the results of the inter-project effects assessment associated with the construction, operation and decommissioning of the Proposed Development. Inter-project cumulative effects may arise where there is the potential for two or more developments that are reasonably foreseeable and/or consented, but not yet constructed or operational, within close enough proximity to the Proposed Development to lead to effects on the same receptor.

~~19.2.2~~19.4.2 The inter-project cumulative effects have been assessed within technical **Chapters 6 to 18** (document 6-18) of this ES. However, a summary of the outcomes of these assessments is provided in **Table 19.4** of this chapter.

~~19.2.3~~19.4.3 Qualitative assessments have been undertaken to assess cumulative effects, rather than quantitative assessments (where relevant). This is because quantitative assessments would rely on varying methodologies and underlying assumptions used for the other schemes. Therefore, a qualitative cumulative assessment that uses professional judgement is considered appropriate.

~~19.2.4~~19.4.4 Where the Proposed Development has a negligible effect, there is not considered to be the potential for any cumulative effects. Therefore, the cumulative effects assessment has focused only on minor, moderate, and major impacts identified within the ES.

19.4.5 A detailed description of the assessment methodology for the inter-project cumulative effects can be found in **Chapter 2: EIA Methodology and Consultation** (document reference 6.1.2) of this ES.

~~19.2.5~~ At Deadline 2, an update to the cumulative assessment of inter-project effects was prepared and issued as an ES addendum. **ES Technical Note- Updated Information on Cumulative Projects** (document reference ExA.ESTN-Cumulative-D2.V1) includes all ES technical chapters (6-18) cumulative assessments and prepares summarises effects at Table 4.1 of the document. Therefore, Table 19.4 of this document is superseded by Table 4.1 of **ES Technical Note- Updated Information on Cumulative Projects** (document reference ExA.ESTN-Cumulative-D2.V1).

Table 19.4: Summary of the cumulative effects identified within each of the technical Chapters 6 to 18 of this Environmental Statement

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
Landscape and Visual			
ID 1- B/21/0443 ID 2- B/22/0356 H04-0849-22 ID 14- 21/1337/EIASCR	Construction activity from the Proposed Development across a greater extent of published and local landscape character areas.	This assumes worst-case scenario that construction stage of these schemes overlaps with the construction of the Proposed Development. However, the construction stage of the identified schemes is not known. The significant effects would diminish as the construction work on the Off-site Cable Route Corridor progresses south, with construction stage short term and temporary.	**Significant cumulative effects:** Major adverse effects on LT A Reclaimed Fen and more specifically its LCA A1 Holland Reclaimed Fen during construction if all schemes overlap.
ID 1- B/21/0443 ID 2- B/22/0356 H04-0849-22 ID 14- 21/1337/EIASCR	Operation of the Proposed Development across a greater extent of published and local landscape character areas.	Mitigation by design includes sensitive siting of the solar PV infrastructure and strengthening existing vegetation and planting new vegetation to provide visual screening and minimise effects as far as possible. There is no inter-visibility between the Proposed Development and identified schemes, and therefore the Proposed Development would bring about landscape character effects by virtue of being present in the local area rather than its visibility or effects upon the perceptual	**Not Significant cumulative effects:** Minor adverse effects on LT A Reclaimed Fen and more specifically its LCA A1 Holland Reclaimed Fen during operation.

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
		and experiential qualities of the host landscape.	
ID 1- B/21/0443 ID 2- B/22/0356 H04-0849-22 ID 14- 21/1337/EIASCR	Construction activity from the Proposed Development and the cumulative scheme visibility for visual receptors. Intervisibility with users of the local PROW network would be occasional and glimpses, considered to be be inconsequential with the degree of change negligible. The same would apply to the nearby road and residential receptors, particularly as their visual amenity is already affected by the existing large scale energy infrastructure and properties tend to be heavily enclosed by tree vegetation. Receptors present at Viewpoint 15- Junction of Bicker Drove and Vicarage Drove along Mill Drain would incur cumulative visual effects.	This assumes worst-case scenario that construction stage of these schemes overlaps with the construction of the Proposed Development. However, the construction stage of the identified schemes is not known. The significant effects would diminish as the construction work on the Off-site Cable Route Corridor progresses south, with construction stage short term and temporary.	**Significant cumulative effects:** Major adverse effects on Viewpoint 15- Junction of Bicker Drove and Vicarage Drove along Mill Drain during construction if all schemes overlap.

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
Residential Amenity			
Entire shortlist	There are no cumulative developments on the short-list with the potential for cumulative effects with the Proposed Development on residential amenity.	No additional mitigation required.	**None**
Ecology and Ornithology			
Entire shortlist	There are no cumulative developments on the short-list with the potential for cumulative effects with the Proposed Development on Ecology and Ornithology. Cumulatively the dominant habitat of arable farmland within the region will be reduced, and without mitigation would be considered negligible and Not Significant.	The shortlisted cumulative schemes have proposed sufficient mitigation and or enhancements to ensure loss of arable farmland in Lincolnshire to ensure no significant effects individually. Conversion of arable farmland cumulatively to permanent grassland will reduce run-off of agri-chemicals and soils into the drainage system and eventually into The Wash and Humber Estuary SPA/SAC sites.	**None**
Hydrology, Hydrogeology, Flood Risk and Drainage			
Entire shortlist	For all these cumulative developments, it is assumed they would follow good industry practice in terms of the management of construction works and surface	The 'Other Developments' are likely to be subject to embedded mitigation and additional mitigation, where applicable, as required by the specifics of the proposed schemes to be policy compliant and	**None**

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
	water runoff complying with local and national planning policy and the Water Environment (WFD) regulations. Other proposals will therefore be required to demonstrate (amongst other matters) that flood risk is not increased, that the surface water drainage regime and water quality are not adversely affected and that groundwater aquifers are not affected.	granted DCO consent or planning permission. No additional mitigation is required for the Proposed Development.	
Cultural Heritage			
Entire shortlist	No schemes on the Cumulative shortlist will have an effect on the archaeological or built heritage resource of the land being considered for the Proposed Development. Further, the heritage assets considered sensitive to the Proposed Development through change to setting lie outside the zone of influence with the cumulative schemes.	No additional mitigation required.	**None**

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
Socio-Economic			
ID 8- EN010126	Increase in employment during construction and decommissioning phase	No additional mitigation required due to beneficial effects. The cumulative construction and decommissioning jobs created during the build period are unlikely to add any significant pressure to the labour supply	**Significant cumulative effects (beneficial):** Moderate beneficial, with an increase in the number of new employment opportunities for local residents, for a temporary period of time in North Kesteven.
Entire shortlist	Increase in economic contribution during construction phase	No additional mitigation required due to beneficial effects. The Gross Value Added generated by the Proposed development and shortlisted cumulative schemes is estimated at £230 million.	**Significant cumulative effects (beneficial):** Major beneficial economic output for a temporary period of time in North Kesteven.
1D 3- 19/0863/FUL 1D 4- 19/0060/FUL ID 8- EN010126 ID 13- 14/1034/EIASCR	Increase in accommodation demand during the construction phase	No additional mitigation required. There will be some change in terms of use of the existing amenities, with the need to accommodate 328 workers, but surplus capacity will still be available in all months of the year.	**Not Significant cumulative effects:** Minor to moderate adverse effects on accommodation demand temporarily within North Kesteven.

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
1D 14-21/1337/EIASCR			
Entire shortlist	Increase in economic contribution during the operation phase	No additional mitigation required due to beneficial effects. The Gross Value Added generated by the cumulative developments on the shortlist is likely to be of considerable benefit to North Kesteven.	**Not Significant cumulative effects (beneficial):** Minor to moderate beneficial economic output for a temporary period of time in North Kesteven.
Entire shortlist	Increase in Business Rates during the operation phase	No additional mitigation required due to beneficial effects. The Proposed Development and schemes on the cumulative shortlist could generate up to £2.5million per annum in business rates.	**Significant cumulative effects (beneficial):** Major beneficial economic output for a temporary period of time in North Kesteven.
Entire shortlist	Increase in economic contribution during decommissioning phase	No additional mitigation required dur to beneficial effects. The Gross Value Added generated by the Proposed Development and shortlisted cumulative schemes is estimated at £85.5million.	**Significant cumulative effects (beneficial):** Moderate beneficial economic output for a temporary period of time in North Kesteven.
1D 3- 19/0863/FUL 1D 4- 19/0060/FUL ID 8- EN010126	Increase in accommodation demand during the decommissioning phase	No additional mitigation required. There will be some change in terms of use of the existing amenities, with the need to accommodate 206 workers, but surplus capacity will still be available in all months of the year.	**Significant cumulative effects:** Minor - Moderate adverse effects on accommodation demand temporarily within North Kesteven.

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
ID 13-14/1034/EIASCR 1D 14-21/1337/EIASCR			
Noise and Vibration			
Entire shortlist	The effect of construction works (within the Energy Park), and operational activities associated with the Proposed Development (excluding construction traffic) are relatively localised and limited to a zone of approximately up to 1km. No developments on the cumulative shortlist are within a close proximity to create noise impact from either the construction, operation or decommissioning phase. In relation road traffic noise, the assessment is based on traffic data that takes into account growth factors and is therefore inherently	No additional mitigation required.	**None**

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
	cumulative and no significant effects were identified.		
Climate Change			
ID 1-B/21/0443 ID 3-19/0863/FUL ID 4-19/0060/FUL ID 6- EN010127 ID 9- EN010132 ID 10 - EN010133 ID 12- EN010131 ID 13-14/1034/EIASCR 1D 14-21/1337/EIASCR	Newly installed energy generating capacity	No additional mitigation required.	**Significant cumulative effects (beneficial):** Moderate beneficial contribution towards meeting the UK's net zero targets, and the importance of the local area to contributing to these targets on a national scale.
Transport and Access			
Entire shortlist	There are no cumulative developments on the short-list with the potential for cumulative effects with the Proposed Development due to the temporary nature of the	No additional mitigation required	**None**

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
	Proposed Development's construction phase and the insignificant changes in AADT.		
Air Quality			
Entire shortlist	Existing sensitive receptors located during the construction phase, along the construction routes and vicinity of the construction works with potential increase in road traffic emissions and dust emissions. There are no cumulative effects on air quality greater than negligible significance, and therefore no potential for cumulative effects to occur when considering the Proposed Development along with other nearby projects.	No additional mitigation required. Any development occurring at the same time as the Proposed Development will be required to undertake its own dust risk assessment and implement mitigation to ensure that there are no off-site impacts.	**None.**
Land Use and Agriculture			
Entire shortlist	Loss of Agricultural Land from Cumulative Solar Farms.	No additional mitigation required. The proposed developments on the cumulative shortlist are generally reversible and the loss of BMV agricultural land is more limited	**Significant cumulative effects:** large if all cumulative schemes on the shortlist were granted

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
		and allowing agricultural activities to continue on land for operational lifetime of solar schemes. Each scheme should have embedded construction codes of practice to adopt best practice measures including for soil protection.	consent - a total use of agricultural land would be of the order of 5,950 ha.
Glint and Glare			
Entire shortlist	There are no developments on the cumulative short-list with the potential to generate adverse effects on the same receptors experiencing glint and glare from the Proposed Development.	No additional mitigation required. With landscape mitigation screening in place at the Energy Park most receptors are predicted to receive no glint effects and so any potential for cumulative effects involving the Energy Park would cease to be.	**None.**
Miscellaneous Issues: Major Accidents and Disasters			
Entire shortlist	Increased traffic during construction and decommissioning phases of the Proposed Development in combination with other developments could result in a greater risk of road accidents.	No additional mitigation required.	**None.**
Miscellaneous Issues: Waste			

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
	Pressure on the local recycling plants or landfill sites	If the construction or decommissioning phases of the Proposed Development happen at the same time as the construction phase of another significant scheme within the local area, there may be some cumulative effects associated with waste. Cumulative volumes of waste may put pressure on the capacity of local recycling plants or landfill sites. This would be managed through the CEMP and DRP, and consultation with waste providers. Therefore, effects from cumulative volumes are not expected to be significant. Additionally, cumulative effects may occur from increased HGVs transporting waste to recycling plants and landfill. This is assessed in **Chapter 14: Transport and Access** (document reference 6.1.14) of the Environmental Statement.	**None**
Miscellaneous Issues: Electric, Magnetic and Electromagnetic Fields			
Entire shortlist	Sensitive receptors of EMF's	There are no developments on the short-list with the potential to increase the risk of electromagnetic fields.	**None**
Miscellaneous Issues: Telecommunications, Television Reception and Utilities			

Relevant Cumulative Projects (ID listed in Appendix 2.3 of the ES)	Potential for Cumulative Effect	Mitigation Measure	Residual Cumulative Effect
Entire shortlist	Effects on telecommunications signals, television reception and utilities.	The Proposed Development has been assessed to have no effect on telecommunication, television or utilities. 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 as set out above to reduce the risk of damaging utilities. 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.	**None**

~~19.3~~19.5 INTER-PROJECT CUMULATIVE EFFECTS CONCLUSIONS

~~19.3.1~~19.5.1 The assessment of inter-project cumulative effects has considered the potential for effects from other developments in the area to combine with and intensify effects caused by the Proposed Development.

~~19.3.2~~19.5.2 There is a potential for some significant adverse cumulative effects on the landscape and visual amenity if a number of developments are granted and overlap in construction timings and in operation at the same time as the Proposed Development.

~~19.3.3~~19.5.3 There is potential some significant adverse cumulative effects on land use and agriculture with loss of agricultural land if a number of developments are granted.

~~19.3.4~~19.5.4 There would be significant beneficial effects on employment, economic contribution, and business rates as a result of the combined effect of the Proposed Development with other developments during the construction, operation and decommissioning phases.

~~19.3.5~~19.5.5 When considered in combination with other renewable generation projects over the construction, operation, and decommissioning of the Proposed Development, there would be a major beneficial cumulative effect on climate change through the contribution to the UK's legally binding emission reduction targets.

~~19.4~~19.6 SUMMARY OF IN-COMBINATION CUMULATIVE EFFECTS

~~19.4.1~~19.6.1 This section of the chapter reports the results of the in-combination, or sometimes knows as the 'intra-project', effects assessment associated with the construction, operation and decommissioning of the Proposed Development. In-combination effects result from the different types of effects generated by the Proposed Development having a combined effect on the same receptors.

~~19.4.2~~19.6.2 In-combination effects occur when receptors are subject to residual effects under more than one environmental topic. As such, the residual effects presented in **Chapters 6-18** (document reference 6.1.6-6.1.18) (regardless of whether they are classed as significant or not significant) have been reviewed to identify receptors subject to one or more types of effect to ensure that the interrelationship between each of the aspects of the environment likely to be affected by the Proposed Development has been properly evaluated and considered.

~~19.4.3~~19.6.3 In-combination effects have been considered during the construction, operation, and decommissioning phases of the Proposed Development. In light of the comprehensive range of embedded design measures (set out within the **Mitigation Schedule** (document reference 7.2)), effect interactions have only been considered where residual adverse or beneficial effects of at least minor in at least one receptor group have been identified.

~~19.4.4~~19.6.4 Further details of the intra-project, or in-combination cumulative effects assessment approach is identified in **Chapter 2: EIA Methodology and Consultation** (document reference 6.1.2).

~~19.4.5~~19.6.5 The following receptor groups that have the potential to be subject to in-combination effect interactions have been identified:

- Employment;
- Soil Quality;
- South Forty Foot Drain (Local Wildlife Site);
- Residential Receptors; and
- Road Receptors

~~19.4.6~~19.6.6 **Table 19.5** and **Table 19.6** provide a qualitative assessment of the in-combination effect interactions on these receptor groups. Construction and decommissioning have been presented together because the types of effect interactions would be broadly the same with decommissioning effects likely to be less significant.

~~19.4.7~~19.6.7 No significant adverse effect interactions have been identified.

Table 19.5: Assessment of In-Combination Effect Interactions During Construction and Decommissioning

Receptor Group	Description of potential effect interactions	Residual significance of effect determined through EIA		Effect interactions
Socio Economics; Land Use and Agriculture				
		Socio Economics	Land Use and Agriculture	
Employment	Increase in local employment in the construction phase of the Proposed Development is beneficial. However, there will be disruption to farm business during the construction phase.	Moderate beneficial	Slight adverse	Employment during the construction phase could support 932 temporary jobs, both direct jobs on-site and indirect/induced roles in the wider economy, during the 30-month construction period. This significant benefit to the local economy outweighs the slight adverse effects on the current farm business. However, there will be increased overall labour to manage the sheep, and new full-time farm businesses could emerge with the Proposed Development in place.
Hydrology, Hydrogeology and Flood Risk and Drainage; Land Use and Agriculture				
		Hydrology, Hydrogeology and Flood Risk and Drainage	Land Use and Agriculture	
Soil quality	Construction activities have the potential to give rise to the contamination of surface water	Negligible	Slight adverse	Effects would be localised and temporary and controlled using good practice measures set out within the **Outline Construction and**

Receptor Group	Description of potential effect interactions	Residual significance of effect determined through EIA		Effect interactions
	resulting from the mobilisation of silts and contaminants during soil stripping and earthworks operations, potentially leading to increased silt loading in watercourses.			**Environmental Management Plan** (document reference 7.7) and **Outline Soil Management Plan** (appendix of oCEMP)
Ecology and Ornithology; Air Quality				
		Ecology and Ornithology	Air Quality	
South Forty Foot Drain Local Wildlife Site	South Forty Foot Drain (LWS) will be crossed by the Off-Site cable route with the potential combined effect of cabling and highway works and air quality effects on ecological receptors.	Minor- moderate adverse	Negligible	Direct drilling under the South Forty Foot Drain will limit negative effects on ecology receptors, with a setback of launch pits for the hydraulic drilling within fields either side of the drain. Construction works and impact of vehicle emissions linked to the direct drilling will not significantly affect air quality for receptors at the South Forty Foot Drain. Control documents such as the **Outline Construction and Environmental Management Plan** (document reference 7.7) provides measures to mitigate

Receptor Group	Description of potential effect interactions	Residual significance of effect determined through EIA		Effect interactions
				construction and drilling methods.
Residential Visual Amenity, Noise and Vibration				
		Residential Visual Amenity	Noise and Vibration	
Residential receptors	The combined effect of noise disturbance and the visual effect from construction works (construction plant, fencing, bare ground etc.) has the potential for increased adverse effects on Residential receptors	Moderate adverse (if not lower as construction phase excluded from assessment, any effects are anticipated to be lower than those experienced during the operational phase (moderate))	Negligible- Minor adverse	Construction activities are temporary in nature; and with good practice measures, restriction of working hours controlled within the **Outline Construction and Environmental Management Plan** (document reference 7.7) for noise, in combination with residential visual amenity effects, are not considered beyond moderate adverse.
Landscape and Visual, Transport and Access				
		Landscape and Visual	Transport and Access	
A17 motorists	Static viewpoints of the construction work would be perceptible to a varying degree by the nearby road receptors. Views from the A17 would be largely fleeting	Moderate adverse	Negligible	The difference between the visual amenity effects on motorists and the overall change in-combination with the minor effects anticipated on vehicle traveller accidents and safety is expected to be a detectable but non-material change. The in-combination

Receptor Group	Description of potential effect interactions	Residual significance of effect determined through EIA		Effect interactions
	and channeled by the built form in East Heckington and roadside vegetation. Where the road is more open, views north towards the Energy Park would be oblique to very oblique and fleeting. The local transport network will experience a higher volume of Heavy Goods Vehicle (HGV) traffic. There is the potential for the reduced visual amenity to be exacerbated by the increased number of HGVs visible on the road network.			effects are not considered beyond moderate adverse and will be temporary in nature.

Table 19.6: : Assessment of In-Combination Effect Interactions During Operation

Receptor Group	Description of potential effect interactions	Residual significance of effect determined through EIA		Effect interactions
Residential Visual Amenity, Noise and Vibration				
		Residential Visual Amenity	Noise and Vibration	
Residential receptors	The combined effect of noise disturbance and the visual effect from operational noise has the potential for increased adverse effects on Residential receptors	Moderate adverse	Negligible- Minor adverse	Detailed design and selection of electrical/mechanical plant has been considered to achieve suitable noise limits. Requirement 15 of the **Development Consent Order** (document reference 3.1) will secure suitable noise limits that total rated noise levels L_{Ar}, do not exceed suitable plant noise limits. In combination with residential visual amenity effects are not considered beyond moderate adverse.
Landscape and Visual, Transport and Access				
		Landscape and Visual	Transport and Access	
A17 motorists	Static viewpoints of the operation of the Energy Park would be perceptible to a varying degree by the nearby road receptors. Views from the A17 would	Minor adverse	Negligible	The difference between the visual amenity effects on motorists and the overall change in-combination with the minor effects anticipated on vehicle traveller accidents and safety is expected to be a detectable but non-material

Receptor Group	Description of potential effect interactions	Residual significance of effect determined through EIA		Effect interactions
	be largely fleeting and channeled by the built form in East Heckington and roadside vegetation. Where the road is more open, views north towards the Energy Park would be oblique to very oblique and fleeting. The local transport network will experience a higher volume of Heavy Goods Vehicle (HGV) traffic. There is the potential for the reduced visual amenity to be exacerbated by the increased number of HGVs visible on the road network.			change. The in-combination effects are not considered beyond minor adverse.