



Mallard Pass

Solar Farm

Mallard Pass Solar Farm

Environmental Statement Volume 1 Chapter 15: Other Environmental Topics

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15.0 Other Environmental Topics

15.1. Introduction

- 15.1.1. The purpose of this Environmental Statement (ES) chapter is to collate the assessment of other environmental topics that do not warrant individual chapters, either due to the brevity of the assessment or due to the small impacts associated with the Proposed Development.
- 15.1.2. This chapter describes and assesses the effects of the Proposed Development on:
- a. Air Quality (**Section 15.2**);
 - b. Arboriculture (**Section 15.3**);
 - c. Glint and Glare (**Section 15.4**);
 - d. Major Accidents and/or Disasters (**Section 15.5**);
 - e. Utilities (**Section 15.6**); and
 - f. Waste (**Section 15.7**).
- 15.1.3. These assessments have taken the following policy into consideration:
- a. Overarching National Policy Statement (NPS) for Energy EN-1 (2011);
 - b. NPS for Renewable Energy EN-3 (2011);
 - c. NPS for Electricity Networks EN-5 (2011);
 - d. Draft NPS EN-1 (2021);
 - e. Draft NPS EN-3 (2021); and
 - f. National Planning Policy Framework (NPPF) (2021).
- 15.1.4. Where relevant, the legislation and guidance, baseline conditions, assessment methodology, and mitigation measures are outlined in the following sections for each topic.
- 15.1.5. This chapter is supported by the following technical appendices provided in Volume 2 of this ES [**EN010127/APP/6.2**]:
- a. ***Appendix 15.1: Air Quality Monitoring Data***

- b. **Appendix 15.2: Arboricultural Impact Assessment (AIA)**; and
- c. **Appendix 15.3: Solar Photovoltaic Glint and Glare Study**.

15.1.6. This chapter is also supported by the following management plans:

- a. **Outline Construction Environmental Management Plan (oCEMP)**
[EN010127/APP/7.6]
- b. **Outline Operational Environmental Management Plan (oOEMP)**
[EN010127/APP/7.7]
- c. **Outline Decommissioning Environmental Management Plan (oDEMP)** [EN010127/APP/7.8]
- d. **Outline Landscape and Ecological Management Plan (oLEMP)**
[EN010127/APP/7.9].

15.1.7. Abbreviations and capitalised terms are defined in the **Glossary, Chapter 0** of this ES.

15.2. Air Quality

Introduction

15.2.1. This section considers the potential effects of the Proposed Development on air quality during the construction, operation and decommissioning phases of the Proposed Development. Where necessary, appropriate mitigation measures have been recommended to reduce adverse effects.

Relevant Legislation, Guidance and Policy

15.2.2. Assessment of likely significant impacts to air quality have been undertaken in line with the following legislation and guidance documents.

- a. The UK Air Quality Strategy (AQS) (2007);
- b. The Air Quality (England) Regulations (2010);
- c. The Air Quality Standards (Amendment) Regulations (2016);
- d. Department for Environment Food and Rural Affairs (Defra) (2019).
Clean Air Strategy;

- e. The Environment Act (2021);
- f. EPUK and IAQM Land-Use Planning & Development Control: Planning for Air Quality (2017);
- g. Institute of Air Quality Management (IAQM) (2014). Guidance on the assessment of dust from demolition and construction;
- h. Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework;
- i. Ministry of Housing, Communities & Local Government (2019). Planning Practice Guidance: Air Quality;
- j. Defra Local Air Quality Management Technical Guidance (LAQM.TG (22)) (2022);
- k. Design Manual for Roads and Bridges (DMRB) (2020);
- l. IAQM Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (2020);
- m. SKDC Local Plan 2011- 2036 (2020); and
- n. RCC Adopted Core Strategy DPD (2011).

Consultation Responses

15.2.3. Consultation undertaken to date in relation to air quality is outlined in the **Consultation Report [EN010127/APP/5.1]** submitted with the application. **Table 15-1** outlines the matters raised within the Scoping Opinion and key themes raised during statutory consultation and how these have been addressed through the ES.

Table 15-1: Air Quality consultation comments and responses

Consultee	Matter Raised	Response
Lincolnshire County Council	LCC does not have an in-house specialist and so has no specific comments to offer at this stage. We therefore recommend and endorse any recommendations or comments made by South Kesteven District Council and Rutland County Council on this particular topic.	No action required.

Consultee	Matter Raised	Response
Rutland County Council	No comments – approach to assessment in accordance with best practice.	No action required.
South Kesteven District Council Environmental Health Officer	<p>Air quality impacts are minimal as the operation of the solar farm has no physical emissions. There will be minor emissions such as dust for the construction phase, but this is dependent upon weather conditions and vehicle movements over the existing agricultural land, which if all grassed should not cause issues of airborne dust.</p> <p>The applicant has a construction management plan which addresses noise and dust and has procedures for dealing with any issues such these arise.</p> <p>Overall, Environmental Protection are satisfied with the assessments that have been completed for noise and air emissions and the proposed controls and mitigation measures that the applicant is proposing. Environmental protection would still respond to any issues under nuisance should any noise or airborne issues arise from the proposed development.</p>	No action required.

Assessment Methodology

- 15.2.4. The assessment methodology for the likely significant impacts to air quality during the construction phase is based on relevant legislation and guidance outlined above.
- 15.2.5. LAQM.TG (22) (Defra, 2022) and Environmental Protection UK (EPUK)/ Institute of Air Quality Management (IAQM) guidance ‘Land-Use Planning and Development Control: Planning for Air Quality’, published in 2017, has been used to determine the sensitivity of human receptors to changes in pollutant concentrations due to an increase in construction traffic emissions.
- 15.2.6. The EPUK/IAQM guidance sets out thresholds for traffic generation at which point a detailed assessment of road traffic impacts should be undertaken, including dispersion modelling if necessary. If traffic generation is within the criteria, in line with EPUK / IAQM guidance, the impact to Air Quality can be considered insignificant.
- 15.2.7. The criteria considered for this assessment are as follows:

- a. Change of light duty vehicles (LDV) flows of more than 500 annual average daily traffic (AADT); and
 - b. Change of heavy-duty vehicles (HDV) flows of more than 100 AADT.
- 15.2.8. As detailed in **Chapter 9: Highways and Access** of this ES [EN010127/APP/6.1], it is proposed that Heavy Goods Vehicles (HGVs) access the Order limits via Route 1 to enter the primary compound before departing via Route 3.
- 15.2.9. Route 1 proposes to access the Order limits from the A1 in the west, which forms part of the Strategic Road Network (SRN), via the B1081 Old Great North Road, Ryhall Road and the A6121 Essendine Road.
- 15.2.10. Route 3 proposes to access the Order limits via the junction of the A47 with the A15 from the east, before travelling via Bourne (A15) and Raymond Mays Way (south of Bourne), before connecting with the A6121 Stamford Road.
- 15.2.11. During the peak construction year, there is predicted to be a daily peak of 105 LGVs and 54 HGVs generated over the course of the 24-month construction programme. The average predicted daily flows are 58 LGVs and 42 HGVs, although for the purposes of the ES only the peaks in construction traffic will be assessed. These traffic flows are based on a worst-case scenario with the Proposed Development being built to the maximum parameters, as set out within **Chapter 9: Highways and Access**, of this ES.
- 15.2.12. With reference to the EPUK/ IAQM screening criterion discussed above, dispersion modelling of additional vehicles associated with the construction phase will not be required and impacts can be considered as having an insignificant effect.
- 15.2.13. With regard to the impact of construction traffic on sensitive ecological receptors, DMRB and IAQM guidance state the potential for significant effects is caused by a cumulative increase in annual average daily traffic flows of 1000 vehicles on any one road link per day. As stated above, the

predicted trip generation is well below this threshold, and it is not considered likely that the cumulative impact will cause an increase of greater than 1,000 vehicles per day.

- 15.2.14. As the IAQM guidance thresholds are not exceeded the assessment of construction traffic emissions is not required. Therefore, the methodology for determining the significance of effects is not applicable as these effects are by default negligible and not significant.

Assumptions and Limitations

- 15.2.15. The following assumptions and limitations have been considered:
- a. It has been assumed that construction phase mitigation measures included in the oCEMP will be effectively implemented and, as such, no significant effects will arise from construction activities; and
 - b. The ability to predict likely significant air quality effects is dependent upon the traffic flow predictions for the project.

Baseline Conditions

- 15.2.16. A baseline air quality review has been undertaken to determine the existing air quality in the vicinity of the Order limits with reference to:
- a. Air quality data from the recent RCC and SKDC Annual Status Reports; and
 - b. Background pollution maps from the Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management (LAQM) website.
- 15.2.17. The Order limits are located approximately 23.1km to the south-east of the nearest Air Quality Management Area (AQMA) declared for concentrations of nitrogen dioxide (NO₂). This AQMA is SKDC no.6 AQMA, located in Grantham, and has been declared for exceedances of the annual and 1-hour mean NO₂ Air Quality Objective (AQO). Due to the distance from the Order limits, and proposed construction routes and anticipated vehicle numbers, it is not expected this AQMA will be affected by the Proposed Development.

15.2.18. Neither RCC nor SKDC currently undertakes any automatic air quality monitoring and therefore no monitoring data is available for particulate matter (PM₁₀ and PM_{2.5}). RCC utilised 11 diffusion tubes to monitor annual mean nitrogen dioxide (NO₂) concentrations across its administrative area in its latest year with available data, 2018, whilst SKDC utilised 58 diffusion tubes during 2020, the most recent year with available data. There are no diffusion tubes located within 1.5km of the Order limits; however, one RCC and 11 SKDC diffusion tubes are located between approximately 2km and 3.5km from the Order limits. **Table 15-2** provides the latest annual mean NO₂ concentrations at the nearest diffusion tube locations to the Order limits for the years 2015 to 2020.

15.2.19. The pollutant concentrations recorded at the diffusion tubes in 2020 and 2021 are not considered to be representative of "normal" air quality conditions. Whilst it is expected that as a result of the COVID-19 pandemic behaviours will change in the future, the impact of this on long-term air quality is currently unknown and therefore the use of 2020 and 2021 data will be omitted from any analysis, but has been included for information.

Table 15-2: Annual Mean NO₂ Diffusion Tube Data (µg/m³)

Diffusion Tube ID	Diffusion Tube Name	Site Type	Distance from Order Limits (km)	2015	2016	2017	2018	2019	2020	2021
4 (RCC)	Tickencote	Rural	4.9	14.1	17.7	12.8	18.5	-	-	-
SK1/ SK2 (SKDC)*	Scotgate	Roadside	2.9	35.7	36.7	32.7	30.7	28.4	21.4	24.3
SK3 (SKDC)	Essex Road	Roadside	2.7	15.1	16.3	16.0	13.8	13.1	9.5	11.0
SK4 (SKDC)	Opp Stam' Sch	Roadside	2.2	35.9	36.6	33.4	29.9	30.3	21.3	24.9
SK5/ SK6 (SKDC)*	East St	Roadside	2.1	34.1	37.8	32.8	31.1	30.1	23.5	27.0
SK7 (SKDC)	Stam' School	Roadside	2.2	34.1	38.8	38.8	32.7	32.8	25.5	28.0

Diffusion Tube ID	Diffusion Tube Name	Site Type	Distance from Order Limits (km)	2015	2016	2017	2018	2019	2020	2021
SK8 (SKDC)	London Inn	Roadside	2.7	25.9	27.8	25.0	25.7	22.5	15.8	18.4
SK9 (SKDC)	All Saints Rd	Roadside	2.7	27.7	26.4	26.7	25.0	23.9	17.9	19.2
SK10 (SKDC)	Avondale	Roadside	3.2	15.3	19.9	22.0	20.2	18.3	14.7	15.1
SK58 (SKDC)	Wharf Rd Stamford	Roadside	2.6	-	-	33.1	31.1	24.6	19.3	18.5

Note: * Located in duplicate.

15.2.20. There have been no exceedances of the annual mean NO₂ objective of 40 µg/m³ at any of the diffusion tubes located nearest to the Order limits in the years between 2015 and 2019 with available monitoring data recorded. The location with the highest concentration in 2019 was SK7 (Stam' School), located on the A6121 East Street in Stamford, monitoring 32.8 µg/m³ or 82% of the annual mean AQO. As such it is considered likely that no exceedances of the annual mean AQO will be experienced in the vicinity of the Order limits.

15.2.21. The 1-hour mean AQO for NO₂ is 200 µg/m³ and should not be exceeded more than 18 times within a year. In line with Local Air Quality Management Technical Guidance (LAQM.TG (16)), exceedance of the 1-hour mean NO₂ AQO are unlikely to occur where the annual mean concentration is below 60 µg/m³. Concentrations at nearby diffusion tubes shown in Table 15.2, therefore, shows that the 1-hour mean NO₂ AQO is unlikely to be exceeded at these locations.

Site-specific Baseline Monitoring

- 15.2.22. Six months of passive diffusion monitoring at six locations in the vicinity of the Order Limits has been undertaken to supplement the air quality monitoring data collected by RCC and SKDC.
- 15.2.23. Annual mean NO₂ concentrations were below the 40 µg/m³ AQO at all monitored locations. A maximum concentration of 22.6 µg/m³ was recorded at passive diffusion tube monitoring location 3 which represents 56.5% of the annual mean NO₂ AQO.
- 15.2.24. Full details are provided in **Appendix 15.1**.

Defra Predicted Background Concentrations

- 15.2.25. Defra background concentrations have been obtained from the national maps published by Defra. These estimated concentrations are produced on a 1km by 1km grid basis for the whole of the UK. The Order Limits fall into multiple grid squares. The range of predicted concentrations in across all grid squares covering the Order limits for NO₂, PM₁₀ and PM_{2.5} are provided in **Table 15-3** for current year (2022), the anticipated earliest year of construction (2026), and the first year of operation (2028).

Table 15-3: Estimated annual mean background concentrations in 2022, 2026 and 2028 in µg/m³

Year	Background (µg/m ³)		
	NO ₂	PM ₁₀	PM _{2.5}
2022	6.3 - 8.6	14.5 – 17.2	8.2 – 9.6
2026	5.7 - 7.3	14.0 – 16.7	7.9 – 9.2
2028	5.5 – 6.9	14.0 – 16.7	7.9 – 9.2

- 15.2.26. It can be seen that the modelled background concentrations are below the relevant annual mean AQOs for NO₂ (40 µg/m³), PM₁₀ (40 µg/m³) and PM_{2.5} (25 µg/m³) in all years across the Order limits.

Future Baseline

15.2.27. Air quality is generally expected to improve with time, potentially as a result of more stringent emission standards for motor vehicles. The uptake of low emission vehicles which will in turn gradually replace older more polluting diesel cars is expected to improve local air quality in the future. This trend is reflected in **Table 15-3**, which indicate an expected reduction in concentrations of NO₂, PM₁₀ and PM_{2.5} in future years.

Embedded Mitigation

- 15.2.28. An **outline Construction Transport Management Plan (oCTMP)** [EN010127/APP/7.11] and an **oCEMP** prepared in support of the DCO Application set out measures to manage potential air quality effects during construction.
- 15.2.29. The **oCEMP** includes measures to minimise dust emissions and establish non-road mobile machinery (NRMM) controls during the construction phase. The **oCEMP** sets out the requirement for a Dust Management Plan (DMP) to be prepared as part of the CEMP (based on the **oCEMP**), prior to the construction of the Proposed Development, which would contain dust emission control measures applied during construction. These measures include:
- a. Sheet vehicles carrying dusty substrates;
 - b. Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on un-surfaced haul roads and work areas;
 - c. Use enclosed chutes, conveyors and covered skips, where practicable;
 - d. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
 - e. Ensure equipment is readily available onsite to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

- 15.2.30. Taking into account the dust emission control measures in the **oCEMP**, there are not anticipated to be any significant adverse effects on air quality relating to dust during the construction phase.
- 15.2.31. The **oCTMP** includes a one-way system for HDVs accessing the Order limits to minimise the number of HDVs travelling on any one road link, as well as other measures to reduce construction traffic movements on the public highway network.

Assessment of Potential Effects

Construction phase

- 15.2.32. The impacts of emissions from the road traffic associated with the construction of the Proposed Development on NO₂, PM₁₀ and PM_{2.5} have the potential to affect existing sensitive receptors (such as dwellings, schools, medical facilities and ecological designated sites) located at the roadside of the proposed construction routes for the anticipated 24 months of construction. However, given the predicted construction traffic trip generation set out in **Chapter 9: Transport and Access**, which is below the IAQM thresholds, any impact on air quality is expected to be negligible with reference to EPUK/ IAQM guidance and the EIA significance criteria set out in **Chapter 2: Overview of EIA Process**, therefore no significant effects are anticipated.
- 15.2.33. It is assumed that the mitigation measures included in the CEMP are sufficient to minimise emissions from dust and NRMM at sensitive receptors to a point at which they are negligible and not significant. As such, as no likely significant effects are anticipated to arise, this is not considered further within this assessment.

Operational phase

- 15.2.34. There are not anticipated to be any significant effects on air quality during the operation of the Proposed Development as traffic flows are expected to be below EPUK/ IAQM screening criterion (based on the vehicle numbers

set out in **Chapter 9: Highways and Access**) and no combustion plant will be present onsite. A detailed assessment of emissions from operational road traffic and the subsequent impact upon local air quality is therefore not required and will not be considered further within this assessment. In addition, it should be noted that an **oOEMP** has been prepared, including mitigation measures to minimise emissions from dust or NRMM.

Decommissioning phase

- 15.2.35. The Applicant is not seeking a time limited operational period, however, even if the Scheme was decommissioned after 40 years, it is expected that baseline air quality conditions will be much improved due to improving vehicle technology and emerging national policy shifts to zero emission vehicles. Therefore, there are not anticipated to be any significant adverse effects to air quality during the decommissioning of the Proposed Development.
- 15.2.36. While the details of the decommissioning stage are not fixed at this stage, it is anticipated that the effects will be similar in nature to construction, although of a shorter duration. It is also assumed that the number of construction vehicles during the decommissioning phase will be no greater than during construction. In addition, it should be noted that an **outline Decommissioning Environmental Management Plan (oDEMP)** has been prepared, including mitigation measures to minimise emissions from dust or NRMM.

Residual Effects

- 15.2.37. The IAQM guidance (**Ref 15-1**) states that, “Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed”.
- 15.2.38. Emissions from NRMM will be temporary and localised; and will be controlled through best-practice mitigation measures secured through the

CEMP (e.g. appropriate abatement plant or use of mains powered plant instead of combustion plant). For that reason, and based on the IAQM guidance, NRMM emissions would not be significant and, therefore, these emissions have not been modelled nor are required to be considered any further in this assessment.

- 15.2.39. The measures implemented via the **oCTMP** and **oCEMP** are considered sufficient to minimise impacts to air quality from emissions associated with construction traffic and NRMM. Therefore, it is not anticipated that there will be any significant residual effects with regard to air quality.

Cumulative Effects

- 15.2.40. The long list of cumulative developments is presented in **Appendix 16.1** of the ES. The assessment summarised above identified that with the implementation of measures included in the **oCEMP** and **oCTMP**, sensitive receptors will not experience significant effects as a result of the Proposed Development, which are judged to be negligible.
- 15.2.41. It is not anticipated that there is any potential for cumulative effects on air quality, given the residual effects associated with the Proposed Development are predicted to be negligible. Should any significant effects occur, these would be as a result of the other developments, either in isolation or in combination with each other, with the Proposed Development providing at worst a negligible contribution to this cumulative effect. The interaction of effects is set out in **Chapter 16: Interaction of Effects and Cumulative Effects**, of this ES [EN010127/APP.6.1].

15.3. Arboriculture

Introduction

- 15.3.1. This section considers the potential effects generated by the Proposed Development during construction, operation and maintenance, in relation to Arboriculture.

- 15.3.2. It has been agreed with the Planning Inspectorate (PINS) to scope out the arboricultural impacts from the ES and provide a standalone Arboricultural Impact Assessment (AIA). This is provided at **Appendix 15.2 [EN010127/APP/6.2]** and comprises a Tree Survey, Arboricultural Impact Assessment, Preliminary Arboricultural Method Statement, and Preliminary Tree Protection Plan, for the existing trees within the Order limits.
- 15.3.3. A summary has been included within this chapter to provide an overview of the methodology and the potential effects that could arise as a result of the Proposed Development.

Assessment Methodology

- 15.3.4. The baseline survey of the study area has been completed in accordance with British Standard (BS) 5837:2012 '*Trees in relation to design, demolition and construction. Recommendations*' (**Ref 15-2**).
- 15.3.5. The study area includes all trees within the Order limits and also those outside that are considered to be within the influencing distance – i.e. stems located a maximum of 30m beyond the Order limits boundary. This is based on guidance from the Forestry Commission and Natural England "*Ancient woodland, ancient trees and veteran trees: advice for making planning decisions: buffer zone recommendations*" which states that "*the proposal should have a buffer zone of at least 15m from the boundary of the woodland to avoid root damage*" (Natural England and Forestry Commission, 2022) [**Ref 15-3**]. Given that woodland edge, trees can have wide spreading canopies that may extend 10m or more from the stem, the 30m ensures compliance with Forestry Commission and Natural England guidance.
- 15.3.6. The impact of the Proposed Development to trees will be determined by calculating the sphere of influence to and from the trees in accordance with BS 5837:2012. This provides guidance for characterising the present and future growth potential of trees (both above and below ground growth) by combining calculations from known measurements with interpretative skills

from experienced arboriculturists. Once this is completed, the tree data is overlaid with the parameters of the Proposed Development to inform the AIA.

Baseline Conditions

- 15.3.7. The Tree Survey identified a total of 251 individual trees, 84 groups of trees, 32 areas of trees, 143 hedges, and 32 areas of woodland. Of these, 7 trees are classed as Veteran trees. These are:
- a. M-T020;
 - b. N-T006;
 - c. N-T009;
 - d. PF-T010;
 - e. PF-T031;
 - f. M-T061; and
 - g. M-T064.
- 15.3.8. It has been confirmed by Rutland District Council that there are no Tree Preservation Orders (TPOs) identified within the area of the Order limits which falls within their administrative area. The same information request has been issued to South Kesteven District Council; however, no information has been forthcoming at the time of writing (November 2022).

Embedded Mitigation

Design of the Proposed Development

- 15.3.9. Given the location and distribution of trees across the Order limits and the recognition of the importance of trees within the design team, the need for construction facilitation tree works will be primarily limited to providing access where no other workable alternative exists. This has all been fully informed and detailed by the baseline survey and accommodated within the design of the Proposed Development. From this, practical arboricultural constraints have been identified to inform the design, and tree-related

conflicts between construction and tree growth space have been minimised. The layout of the PV Arrays, fencing and access tracks have been refined where possible within the Order limits.

- 15.3.10. The AIA was undertaken in parallel with the design process to ensure arboricultural impacts have been minimised, and tree protection measures have been maximised to secure the trees unharmed retention during the construction and operation of the Proposed Development. This is achieved by itemising in detail the impact on trees and providing specific guidance on tree protection measures during the construction phase.

Construction Mitigation

- 15.3.11. A detailed Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) will be prepared and will form part of the CEMP(s). The AMS and TPP will identify the specification for tree protection measures and the methodology for sensitive works in proximity to retained trees during construction and be in accordance with the requirements of BS 5837:2012.
- 15.3.12. A pre-construction tree survey will be undertaken where construction works are likely to affect trees. The findings and recommendations of these will be taken into account by the appointed principal construction contractor.
- 15.3.13. Where works in close proximity to retained trees cannot be practically avoided, these works will be undertaken in accordance with current best practice, defined in British Standard (BS) 5837: 2012 'Trees in relation to design, demolition and construction'. Measures to protect trees from accidental damage during the construction and decommissioning phases of the Proposed Development have been set out within the **oCEMP** and the **oDEMP**.

Operation

- 15.3.14. The management of trees (as well as other landscape elements) will be undertaken in accordance with the **oLEMP**. The **oLEMP** will be

implemented by qualified arboriculturists were required to avoid adverse effects on trees during the operational phase.

- 15.3.15. Pruning if required by qualified arborist to be undertaken in later winter (February), inspections to monitor health of trees and to remove dead, dying or diseased wood where necessary in accordance with BS3998:2010 as set out in the **oLEMP**.

Decommissioning

- 15.3.16. Prior to decommissioning, a detailed Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) will be prepared and will form part of the DEMP(s). The AMS and TPP will identify the specification for tree protection measures and the methodology for sensitive works in proximity to retained trees during decommissioning and be in accordance with the requirements of BS 5837:2012.
- 15.3.17. A pre-decommissioning tree survey will be undertaken where decommissioning works are likely to affect trees. The findings and recommendations of these will be taken into account by the appointed principal decommissioning contractor.
- 15.3.18. Where works in close proximity to retained trees cannot be practically avoided, these works will be undertaken in accordance with current best practice, defined in British Standard (BS) 5837: 2012 'Trees in relation to design, demolition and construction'. Further mitigation measures are set out in the **oDEMP**.

Potential Effects

Construction

- 15.3.19. **Table 15-4** details the trees that will be felled to facilitate the construction of the Proposed Development. The design of the Proposed Development has minimised the loss of good quality trees and as such only one category A tree is proposed to be felled.

Table 15-4: Trees to be Felled to Facilitate the Construction of the Proposed Development

Feature No.	Reason for Removal.	BS * Category
M-A029 (Part)	Conflict with construction access visibility splay.	C
M-H044 (Part)	To facilitate the widening of road running alongside feature.	C
M-W003 (Two trees)	To facilitate the widening of road running alongside feature.	A
N-G004	Conflict with construction access visibility splay.	C
N-H002 (Part)	To allow the construction of access entrance.	C
N-H004 (Part)	Conflict with construction access visibility splay.	C
N-H005 (Part)	To enable the construction of the bridge required for access route and for the continuation of the track.	C
N-H017 (Part)	To allow the construction of access entrance.	C
PF-H001 (Part)	To allow the construction of access entrance.	C
PF-H002 (Part)	To enable the construction of the bridge required for access route.	C
PF-H004 (Part)	To facilitate access route.	C
PF-H008 (Part)	To facilitate access to sub-station.	C
PF-H009 (Part)	To facilitate access to sub-station.	C
P-H001 (Part)	To allow the construction of access entrance.	C
P-H005 (Part)	Cable to route through hedgerow.	C
P-H016	Cable to route through hedgerow.	C
P-H022 (Part)	To allow the construction of access entrance.	C
P-H032 (Part)	To facilitate access route.	C

15.3.20. **Table 15-5** details the trees that will undergo tree surgery to facilitate construction of the Proposed Development.

Table 15-5: Trees to Undergo Surgery to Facilitate Construction of the Proposed Development

Feature No.	Description of Works Required	BS Category*
P-T026	Undertake linear root pruning.	A
P- W007	Undertake a crown reduction of 3.5m on the western aspect.	B
PF-A015	Undertake root pruning along edge of passing bay and manage adjacent trees to half their current height and supplement with whips to form thickened hedgerow.	B
M-W009	Crown lift to 4.5m over construction access track.	B
N-H030	Undertake root pruning along edge of passing bay.	C
N- T041	Undertake linear root pruning.	A
N- T042	Undertake linear root pruning.	A

15.3.21. The Proposed Development has eight points of access required to enter the Solar PV Site and Mitigation and Enhancement Areas from the public highway. These areas are unencumbered by the Root Protection Areas (RPA) of any trees to be retained. Therefore, and from a purely arboricultural perspective, it will not be necessary to install a proprietary temporary load bearing road to protect tree roots.

15.3.22. The proposed access tracks encroach within a small portion of the RPA of the following trees to be retained – P-T026, N-T041 and N-T042. Given the minor extent of the intrusion at this location it is considered appropriate to undertake linear root pruning as part of the access facilitation pruning (AFP) works and/or micro-sitting of the access tracks to avoid the RPAs. This operation will obviate the need for “no dig” construction methods in this situation.

15.3.23. It is assumed that level changes will not occur within the RPA of trees that are shown to be retained.

15.3.24. The potential for accidental damage caused to trees during construction will be mitigated through the implementation of measures secured by the **oCEMP** as set out in the Embedded Mitigation Section above.

Operation

15.3.25. During operation the potential for adverse effects on trees due to management activities to maintain the operational performance of the Proposed Development (e.g. tree management to avoid shading on the PV Panels) will be mitigated by the measures secured by the **oLEMP** as set out in the Embedded Mitigation Section above.

Decommissioning

15.3.26. The potential for accidental damage to be caused to trees during decommissioning will be mitigated through the implementation of measures secured by the **oDEMP** as set out in the 'Embedded Mitigation' Section above.

Additional Mitigation

15.3.27. No additional mitigation is required to avoid significant adverse effects on trees.

Residual Effects

15.3.28. Provided that all measures identified in the AIA, subsequent AMS/TPP and LEMP are fully complied with, there are no reasonably foreseeable significant adverse effects from an arboricultural perspective as a result of the construction, operation and decommissioning of the Proposed Development. The recommended tree surgery will help to promote the longevity and safety of the existing trees within the Order limits, and is not considered significant.

Cumulative Effects

- 15.3.29. No cumulative effects are anticipated in relation to arboriculture as the fellings and surgeries referred to above can only be an impact from the Proposed Development.
- 15.3.30. Should any significant effects occur, these would be as a result of the other developments, either in isolation or in combination with each other, with the Proposed Development providing at worst a negligible contribution to this cumulative effect. The interaction of effects is set out in **Chapter 16: Interaction of Effects and Cumulative Effects**, of this ES [EN010127/APP.6.1].

15.4. Glint and Glare

Introduction

- 15.4.1. This section summarises the potential effects of the Proposed Development from glint and glare upon surrounding receptors.
- 15.4.2. The definition of glint and glare used within this assessment is as follows:
- a. 'Glint' refers to a momentary flash of bright light typically received by moving receptors or from moving reflectors.
 - b. 'Glare' refers to a continuous source of bright light typically received by static receptors or from large reflective surfaces.
- 15.4.3. The full study on glint and glare for the Proposed Development was undertaken by Pager Power, and is available in **Appendix 15.3** of the ES. Potential glint and glare effects from the decommissioning phase of the Proposed Development are considered to be similar to the effects experienced during construction, and are unlikely to result in glint and glare effects greater than those at the operational phase.
- 15.4.4. **Appendix 15.3: Solar Photovoltaic Glint and Glare Study** has assessed both the Single Axis Tracker (SAT) and Fixed South Facing (FSF) static panel mounting system, without taking into account the mitigation planting proposed to ensure an assessment of worst-case possible. There is no

worst-case modelling assessment based on one particular panel mounting system, as both mounting types provide varying impacts depending on the specific geometry of the reflection. The results presented within this chapter, therefore, detail the worst-case impacts taken from the results across each of the panel mounting systems.

Relevant Legislation, Guidelines and Policy

Legislation

- 15.4.5. This assessment is carried out in accordance with the principles contained within the following legislation:
- a. The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017;
 - b. The Overarching National Policy Statement for Energy (EN-1) July 2011;
 - c. Draft Overarching National Policy Statement for Energy (EN-1), September 2021;
 - d. National Policy Statement for Renewable Energy Infrastructure (EN-3) July 2011;
 - e. Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (specifically Section 2.52), September 2021;
 - f. National Policy Statement for Electricity Networks Infrastructure (EN-5) July 2011; and
 - g. Draft National Policy Statement for Electricity Networks Infrastructure (EN-5), September 2021.
- 15.4.6. Only the Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) [Ref 15-4] refers to glint and glare in section 2.52 and states that *“the potential for solar PV panels, frames and supports to have a combined reflective quality should be assessed. This assessment needs to consider the likely reflective capacity of all of the materials used in the construction of the solar PV farm”* (paragraph 2.52.2). It also states that

there “no evidence that glint and glare from solar farms interferes in any way with aviation navigation or pilot and aircraft visibility or safety. Therefore, the Secretary of State is unlikely to have to give any weight to claims of aviation interference as a result of glint and glare from solar farms” (paragraph 2.52.5).

Guidance

- 15.4.7. This assessment is carried out in accordance with the principles contained within the following documents:
- a. Guidance for Renewable and Low Carbon Energy (specifically regarding the consideration of solar farms, paragraph 013), 18 June 2015;
 - b. Federal Aviation Administration Policy: Review of Solar Energy System Projects on Federally-Obligated Airports, November 2021 (The UK Civil Aviation Authority (CAA) issued interim guidance relating to Solar Photovoltaic Systems (SPV) on 17 December 2010 and was subject to a CAA information alert 2010/53. The formal policy was cancelled on September 7th, 2012);
 - c. Pager Power (April 2021) Solar Photovoltaic Glint and Glare Guidance - Third Edition V3.1;
 - d. Railway Group Guidance Note: Signal Sighting Assessment Requirements, June 2016.

Consultation Responses

- 15.4.8. Consultation undertaken to date in relation to glint and glare is outlined in the Consultation Report submitted with the application [EN010127/APP/5.1]. **Table 15-6** below outlines the matters raised within the Scoping Opinion, and during statutory consultation, and how these have been addressed through the ES.

Table 15-6: Consultation matters raised and responses for glint and glare

Consultee	Matter Raised	Response
Planning Inspectorate	Paragraph 3.1.7 of the Scoping Report notes that either fixed or tracker mounting structures could be used for the solar arrays. Given that the two different mounting structures are likely to lead to different glint and glare effects, the ES should present the worst-case assessment for both options.	Both fixed and tracker panels have been assessed and the worst-case scenario is presented within the ES.
Planning Inspectorate	The Scoping Report highlights that only railway receptors within 500m of the solar panel area will be included within the assessment. The ES should justify this as an appropriate study area, explaining why no significant effects from glint and glare would occur beyond 500m on railway users.	The 500m study area is based on extensive project experience and consultation with Network Rail. This study area is considered conservative as Network Rail do not typically raise concerns out to 500m from a solar development.
LCC	The British Horse Society's Advice on Solar Farms outlines that 'arrays should be avoided where glare is likely to affect users of an equestrian route'. The initial layout involves the installation of Solar PV panels on either side of Braceborough Public Bridleway No. 1. The Glint and Glare assessment contained within Appendix 14.1 does not appear to consider potential impacts on equestrian users of this route and therefore it is recommended that this be assessed given the positioning of arrays alongside the bridleway.	Hedgerow and tree planting has been proposed either side of PRow to filter and obstruct views of the Proposed Development.
Network Rail	How the scheme impacts on the railway operations in terms of glint and glare issues causing distraction for train drivers approaching and passing the site, how any issues of this nature that may arise are to be mitigated?	Impacts upon railway infrastructure has been assessed within the ES and mitigation in the form of screening has been embedded into the design.
NATS Safeguarding	The Proposed Development has been examined from a technical	Noted.

Consultee	Matter Raised	Response
	safeguarding aspect and does not conflict with NATS Safeguarding criteria.	

Assessment Methodology

15.4.9. The detailed Assessment Methodology is set out in **Appendix 15.3: Solar Photovoltaic Glint and Glare Study**, a short summary of which is presented below:

- a. Identify receptors in the area surrounding the solar development;
- b. Consider direct solar reflections from the solar development towards the identified receptors by undertaking geometric calculations;
- c. Consider the visibility of the panels from the receptor's location. If the panels are not visible from the receptor then no reflection can occur;
- d. Based on the results of the geometric calculations, determine whether a reflection can occur, and if so, at what time it will occur;
- e. Consider both the solar reflection from the solar development and the location of the direct sunlight with respect to the receptor's position;
- f. Consider the solar reflection with respect to the published studies and guidance – including intensity calculations where appropriate; and
- g. Determine whether a significant detrimental impact is expected.

15.4.10. The assessment reviews the potential impacts of the Proposed Development on road users, dwellings, approaching aircraft, Air Traffic Control (ATC) Towers, train drivers, and railway signals.

Receptor Sensitivity

15.4.11. Sensitivity has been determined based on the classifications presented in **Table 15-7**.

Table 15-7: Defining Receptor Sensitivity

Sensitivity	Description
High	The receptor has little ability to absorb change or is of international or national importance.
Medium	The receptor has moderate capacity to absorb change or is of high importance.
Low	The receptor is tolerant of is of low or local importance.

Road Users

15.4.12. To determine the sensitivity of road users, it is relevant to consider that road types can generally be categorised as:

- a. Major National – Typically a road with a minimum of two carriageways with a maximum speed limit of up to 70mph. These roads typically have fast moving vehicles with busy traffic;
- b. National – Typically a road with one or more carriageways with a maximum speed limit of up to 60mph or 70mph. These roads typically have fast moving vehicles with moderate to busy traffic density;
- c. Regional – Typically a single carriageway with a maximum speed limit of up to 60mph. The speed of vehicles will vary with a typical traffic density of low to moderate;
- d. Local – Typically roads and lanes with the lowest traffic densities. Speed limits vary.

15.4.13. Local roads would be considered as ‘low’ sensitivity because the receptor is tolerant of change.

15.4.14. Regional, National, and Major National roads would be considered as ‘medium’ sensitivity the receptor has a moderate capacity to absorb change.

Dwellings

15.4.15. Dwellings are considered ‘medium’ sensitivity because the receptor has a moderate capacity to absorb change.

Aviation

15.4.16. Approaching aircraft and ATC Towers are considered as ‘medium’ sensitivity because the receptor has moderate capacity to absorb change.

Railway

15.4.17. Train drivers and railway signals are considered ‘medium’ sensitivity because the receptor has moderate capacity to absorb change.

Magnitude of Impact

15.4.18. The magnitude of change has been assessed based on the classifications presented in **Table 15-8**.

Table 15-8: Defining Magnitude of Change

Magnitude of Change	Criteria for Assessing Effect
High	Total loss or substantial alteration to key features of the baseline conditions such that receptor attributes will be fundamentally changed.
Medium	Loss or alteration to one or more key features of the baseline conditions such that receptor attributes will be materially changed.
Low	A minor shift away from baseline conditions. Change arising from the alteration will be discernible but not material. The underlying attributes of the baseline condition will be largely unchanged.
Negligible	Very little change from baseline conditions. Change barely distinguishable, approximating to a ‘no change’ situation.

Road Users

15.4.19. The magnitude of the effect upon road user receptors is predominantly dependent on the following factors:

- a. Whether a solar reflection is predicted to be experienced;
- b. The type of road – in the context of traffic speeds and likely densities;
- c. The location of the reflecting panels relative to a road user’s direction of travel – a solar reflection directly in front of a driver is more hazardous than a reflection from a location off to one side.

- 15.4.20. A ‘negligible’ magnitude would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by a road user.
- 15.4.21. A ‘low’ magnitude would occur if solar reflections would all originate from outside a road user’s main field of view. Reflections originating within a road user’s main field of view can be of ‘low’ magnitude based on consideration of the following mitigating factors:
- a. Whether visibility is likely for elevated drivers (applicable to dual carriageways and motorways only) – there is typically a higher density of elevated drivers along dual carriageways and motorways compared to other types of the road; and
 - b. The separation distance to the panel area – larger separation distances reduce the proportion of an observer’s field of view that is affected by glare.
- 15.4.22. A ‘medium’ magnitude would occur if solar reflections were experienced from within a driver’s main field of view and there are insufficient mitigating factors.
- 15.4.23. A ‘high’ magnitude would occur if solar reflections were experienced directly in front of a road user’s direction of travel with no mitigating factors.

Dwellings

- 15.4.24. The magnitude of effect upon dwelling receptors is predominantly dependent on the following factors:
- a. Whether a solar reflection is predicted to be experienced; and
 - b. The duration of the predicted effects, relative to thresholds of three months per year and sixty minutes per day.
- 15.4.25. A ‘negligible’ magnitude would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by an observer within a dwelling.

- 15.4.26. A ‘low’ magnitude would occur when a solar reflection would be experienced for less than three months per year and for less than 60 minutes on any given day. Reflections occurring for more than three months per year or for more than 60 minutes on any given day can be of ‘low’ magnitude based on consideration of the following mitigating factors:
- a. The separation distance to the panel area – larger separation distances reduce the proportion of an observer’s field of view that is affected by glare;
 - b. The position of the Sun – effects that coincide with direct sunlight appear less prominent than those that do not; and
 - c. Whether visibility is likely from all storeys – the ground floor is typically considered the main living space and has a greater significance with respect to residential amenity.
- 15.4.27. A ‘medium’ magnitude would occur if solar reflections were experienced for more than three months per year or for more than 60 minutes on any given day and there are not sufficient mitigating factors.
- 15.4.28. A ‘high’ magnitude would occur if solar reflections were experienced for more than three months per year and for more than 60 minutes on any given day.

Aviation

- 15.4.29. Aviation receptors are most easily separated into two types:
- a. Ground level receptors – most typically the Air Traffic Control (ATC) Tower; and
 - b. Airborne receptors – most typically the approach paths.
- 15.4.30. The magnitude will differ depending on the type of receptor.

ATC Tower

- 15.4.31. The magnitude of effect upon ATC Tower receptors is dependent on the following main factors:

- a. Whether a solar reflection is predicted to be experienced;
 - b. The glare intensity;
 - c. The glare duration;
 - d. Proportion of an observer's field of vision that is taken up by the reflecting area; and
 - e. Glare location relative to key operational areas – a solar reflection originating near sensitive areas such as the runway threshold will have a higher impact upon the ATC Tower personnel.
- 15.4.32. A 'negligible' magnitude would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by ATC personnel.
- 15.4.33. A 'low' magnitude would occur if solar reflections were experienced by ATC personnel but there are sufficient mitigating main factors, or the aerodrome confirmed the level of glare is acceptable.
- 15.4.34. A 'medium' magnitude would occur if solar reflections were experienced by ATC personnel and effects occasionally and marginally affected the safeguarding operations.
- 15.4.35. A 'high' magnitude would occur if solar reflections were experienced by ATC personnel and the safeguarding operations were regularly and substantially affected.

Approach Paths

- 15.4.36. The magnitude of effect upon aircraft approaching a runway (also referred as approach paths) is dependent on the following main factors:
- a. Whether a reflection is predicted to be experienced;
 - b. The glare intensity;
 - c. The location of glare relative to the approach bearing – a solar reflection directly in front of a pilot is more hazardous than a reflection from a location off to one side;

- d. The likely traffic volumes and level of safeguarding at the aerodrome – licensed aerodromes typically have higher traffic volumes and are formally safeguarded;
- e. The position of the Sun – effects that coincide with direct sunlight appear less prominent than those that do not; and
- f. Existing reflecting surfaces – a solar reflection is less noticeable by pilots when there are existing reflective surfaces in the surrounding environment.

15.4.37. A 'negligible' magnitude would occur if solar reflections are not geometrically possible.

15.4.38. A 'Low' magnitude would occur under the following scenarios:

- a. Solar reflections originate from outside a pilot's main field of view;
- b. The glare has a 'low potential for temporary after-image'; and
- c. The glare has a 'potential for temporary after-image' with sufficient mitigating factors.

15.4.39. A 'medium' magnitude would occur if the glare has 'potential for temporary after-image' without sufficient mitigating factors with resulting effects on flight safety.

15.4.40. A 'high' magnitude would occur if solar reflections if the glare has 'potential for permanent eye damage' with resulting effects on flight safety.

Train Drivers

15.4.41. The magnitude of effect upon road user receptors is predominantly dependent on the following factors:

- a. Whether a reflection is predicted to be experienced in practice; and
- b. The location of the reflecting panel relative to a train driver's direction of travel.

- 15.4.42. A ‘negligible’ magnitude would occur if solar reflections are not geometrically possible, or are not predicted to be experienced by a train driver.
- 15.4.43. A ‘low’ magnitude would occur if solar reflections would all originate from outside a train driver’s main field of view. Reflections originating within a train driver’s main field of view can be of ‘low’ magnitude based on consideration of the following mitigating factors:
- a. Whether the solar reflection originates from directly in front of a train driver – a solar reflection that is directly in front of a road user is more hazardous than a solar reflection to one side;
 - b. The separation distance to the panel area – larger separation distances reduce the proportion of an observer’s field of view that is affected by glare;
 - c. The position of the Sun – effects that coincide with direct sunlight appear less prominent than those that do not; and
 - d. Whether a signal, station, level crossing, or switching point is located within the reflection zone – a train driver with a higher workload will be more impacted than a train driver with a lower workload.
- 15.4.44. A ‘medium’ magnitude would occur if solar reflections were experienced from within a train driver’s main field of view and there are insufficient mitigating factors with resulting effects on safe operation of trains.
- 15.4.45. A ‘high’ magnitude would occur if solar reflections were experienced from directly in front of a train driver’s direction of travel with no mitigating factors with resulting effects on safe operation of trains.

Significance of Effect

- 15.4.46. The predicted significance of the effect was determined through a standard method of assessment based on professional judgement, considering both sensitivity and magnitude of change as detailed in **Table 15-9**.

Table 15-9: Significance Criteria

Magnitude of Change	Criteria for Assessing Effect		
	High	Medium	Low
High	Major	Major	Moderate
Medium	Major	Moderate	Moderate
Low	Moderate	Minor	Minor
Negligible	Negligible	Negligible	Negligible

15.4.47. Major and moderate effects are considered significant in EIA terms.

Baseline Conditions

Current Baseline

15.4.48. The relevant study area surrounding the Proposed Development is predominantly rural with some residential areas, regional roads, local roads, and a railway line. The long list of cumulative schemes at **Appendix 2.4** does not identify any proposed solar farms within 10km of the Order limits. The closest proposed Solar Farm of NSIP Scale is at Heckington Fen (Cumulative scheme ID 55), located over 33km to the north east of the Order limits.

15.4.49. Within 10km of the Proposed Development, the following aviation infrastructure is located:

- a. RAF Wittering – located approximately 6.7km south of the proposed development;
- b. Shacklewell Airfield – located approximately 8.3km southwest of the Proposed Development;
- c. Castle Bytham Airfield – located approximately 7.7km north northwest of the Proposed Development;
- d. RAF Cottesmore – located approximately 10.0km northwest of the Proposed Development.

Future Baseline

- 15.4.50. The baseline is expected to remain largely the same in relation to glint and glare, in the absence of the Proposed Development.

Embedded Design Mitigation

- 15.4.51. The Proposed Development design has made provision for enhanced screening of close views to the solar panels and associated built elements from PRowS, local roads (such as the A6121, B1176, Uffington Lane and Carlby Lane) and other publicly accessible areas within and immediate adjacent to the Order limits. This will mitigate the potential effects of glint and glare specifically identified for one dwelling (dwelling 166) where an area of hedgerow is proposed to screen views.

Assessment of Potential Effects

- 15.4.52. The following section summarises the findings of the Glint and Glare Study provided at **Appendix 15.3**, and which are not repeated verbatim here in the interests of proportionality.
- 15.4.53. The assessment of PV Arrays within the Glint and Glare Study has assumed a worst case, conservative approach, that the panels do not have an anti-reflective coating (ARC) and therefore, should the panels chosen at the time of construction be specified with ARC, the anticipated effects will be less than those assessed within the ES.

Aviation

RAF Wittering

ATC Tower

- 15.4.54. The modelling has shown that no solar reflections are geometrically possible towards the ATC Tower at RAF Wittering from both fixed and tracker panel layouts. No impacts upon ATC personnel are predicted and no mitigation is required.

Approach Paths

15.4.55. The modelling has shown that no solar reflections are geometrically possible towards either of the 2-mile approach paths for runway 07/25 at RAF Wittering from both fixed and tracker panel layouts. No impacts upon approaching aircraft are predicted and no mitigation is required.

High Level Aviation

15.4.56. Detailed modelling of Shacklewell Airfield, Castle Bytham Airfield and RAF Cottesmore is not recommended as all potential solar reflections are predicted to be acceptable in accordance with the associated guidance and industry best practice. No significant impacts upon Shacklewell Airfield, Castle Bytham Airfield and RAF Cottesmore are predicted.

Road Users

Fixed Panels

15.4.57. The modelling has shown that solar reflections are geometrically possible towards approximately 2.3km of the B1176 and 2.3km of the A6121. Significant screening in the form of existing vegetation and proposed screening / structure planting tree belt is predicted to significantly obstruct all views of the reflecting panels. No impacts upon road users along the A6121 and B1176 are predicted, and no further mitigation is required.

Tracker Panels

15.4.58. The modelling has shown that solar reflections are geometrically possible towards approximately 2.7km of the B1176 and 2.0km of the A6121. Significant screening in the form of existing vegetation and proposed screening / structure planting tree belt is predicted to significantly obstruct all views of the reflecting panels. No impacts upon road users along the A6121 and B1176 are predicted, and no further mitigation is required.

Dwellings

Fixed Panels

- 15.4.59. The modelling has shown that solar reflections are geometrically possible towards receptors 113 of the 179 assessed dwelling receptors. Solar reflections towards most of these dwellings are predicted to be significantly obstructed by existing and proposed screening, or they do not occur for a duration that could be considered significant. Solar reflections towards seven dwellings occur for a duration which requires further consideration. Mitigation is not recommended for six of these dwellings because:
- 15.4.60. The distance between the observer and the closest reflecting panel area is such that the proportion of an observer's field of vision that is taken up by the reflecting area is significantly reduced;
- 15.4.61. Views are only predicted for observers above the ground floor, which is not considered to be the main living space of a dwelling; and/or
- 15.4.62. Effects will coincide with direct sunlight, which is a far more significant source of light compared to a solar reflection.
- 15.4.63. Mitigation is recommended for one dwelling due to the duration of effects and the lack of sufficient mitigating factors to reduce the level of impact.

Tracker Panels

- 15.4.64. The modelling has shown that solar reflections are geometrically possible towards 108 of the 179 assessed dwelling receptors. Solar reflections towards most of these dwellings are predicted to be significantly obstructed by existing and proposed screening, or they do not occur for a duration that could be considered significant.
- 15.4.65. Solar reflections towards five dwellings occur for a duration which requires further consideration. Mitigation is not recommended for four of these dwellings because:

- 15.4.66. The distance between the observer and the closest reflecting panel area is such that the proportion of an observer's field of vision that is taken up by the reflecting area is significantly reduced;
- 15.4.67. Views are only predicted for observers above the ground floor, which is not considered to be the main living space of a dwelling; and/or
- 15.4.68. Effects will coincide with direct sunlight, which is a far more significant source of light compared to a solar reflection.
- 15.4.69. Mitigation is recommended for one dwelling due to the duration of effects and the lack of sufficient mitigating factors to reduce the level of impact.

Railways

Train Drivers

Fixed Panels

- 15.4.70. The modelling has shown that solar reflections are geometrically possible towards train driver receptors along approximately 3.3km of railway line. Solar reflections towards most of these sections of railway line are predicted to be significantly obstructed by existing and proposed screening or occur from outside of a train driver's primary field of view (30 degrees either side of the direction of travel).
- 15.4.71. Solar reflections towards approximately 100m of railway line occur from within a train driver's primary field of view which requires further consideration. However, mitigation is not recommended for this section of railway line because:
- a. No views of railway signals, stations, level crossings, or switching points is required, suggesting that the workload of a train driver will be low;
 - b. The distance between the observer and the closest reflecting panel area is such that the proportion of an observer's field of vision that is taken up by the reflecting area is significantly reduced; and

- c. Effects will coincide with direct sunlight, which is a far more significant source of light compared to a solar reflection.

Tracker Panels

- 15.4.72. The modelling has shown that solar reflections are geometrically possible towards train drivers along approximately 1.2km of railway line. Solar reflections towards all these sections of railway line are predicted to be significantly obstructed by existing and proposed screening or occur from outside of a train driver's primary field of view. No significant upon train drivers along the assessed section of railway line are predicted, and no further mitigation is required.

Signals

- 15.4.73. No railway signals have been identified on the assessed section of railway line. No impacts upon railway signals are predicted.

Additional Mitigation

- 15.4.74. Additional mitigation is recommended for one dwelling (number 166 in the Glint and Glare Study at **Appendix 15.3**) due to significant effects being predicted, regardless of the panel mounting system (fixed or tracker). An area of new and improved hedgerow is proposed to be planted to the east of the dwelling which will provide filtering and screening of the Solar PV Site. This is detailed within the **oLEMP**.

Residual Effects

- 15.4.75. Once the proposed mitigation has been implemented, there are anticipated to be no likely significant effects.

Cumulative Effects

- 15.4.76. The long list of cumulative schemes is presented in **Appendix 2.4** of the ES. The assessment summarised above identified that with the introduction of the embedded mitigation, receptors will not experience significant effects as a result of the Proposed Development, which are judged to be negligible.

15.4.77. It is not anticipated that there is any potential for cumulative effects arising from Glint and Glare, given the residual effects associated with the Proposed Development are predicted to be negligible. Should any significant effects occur, these would be as a result of the other developments, either in isolation or in combination with each other, with the Proposed Development providing at worst a negligible contribution to this cumulative effect. The interaction of effects is set out in **Chapter 16: Interaction of Effects and Cumulative Effects**, of this ES [EN010127/APP.6.1].

15.5. Major Accidents and/or Disasters

Introduction

- 15.5.1. This section summarises a description of the expected likely effects of the Proposed Development on the environment, deriving from the risks of major accidents and / or disasters which are relevant to the project.
- 15.5.2. The EIA Regulations do not include the definition of major accidents and/or disasters but do require consideration to be given to the risks of a major accident or disaster occurring. For the purposes of the assessment, the following three definitions of accidents and disasters have been used within the context of the Proposed Development:
- a. The Control of Major Accidents Hazard (COMAH) Regulations, 2015, defines a major accident as *“an occurrence such as a major emission, fire, or explosion resulting from uncontrolled development, leading to serious danger to human health or the environment (whether immediate or delayed) inside or outside the establishment, an involving one or more dangerous substances”*.
 - b. The International Federation of Red Cross & Red Crescent Societies Disaster and Crises Management Guidance provides a useful definition for disaster, which is *“a sudden calamitous event that seriously disrupts the functioning of a community or society and causes human, material, and economic or environmental losses that exceed the community’s or*

society's ability to cope using its own resources. Though often caused by nature, disasters can have human origins"; and

- c. The Oxford English Dictionary defines an accident as "*an unfortunate incident that happens unexpectedly and unintentionally, typically resulting in damage or injury*".

Relevant Legislation, Guidelines and Policy

- 15.5.3. To help identify major accidents and/or disasters which are relevant to the Proposed Development, the following guidance documents have been referred to:
 - a. Cabinet Office National Risk register of Civil Emergencies 2017 edition [Ref 15-5] which provides an updated government assessment of the likelihood and potential impact of a range of different civil emergency risks (including naturally and accidentally occurring hazards and malicious threats) that may directly affect the UK over the next 5 years;
 - b. MH Government: Emergency Response and Recovery [Ref 15-6] which establishes good practice based on lessons identified from responding to and recovering from emergencies, both in the UK and internationally; and
 - c. IEMA guidance 'Major Accidents and Disasters in EIA' [Ref 15-7].

Consultation Responses

- 15.5.4. Consultation undertaken to date in relation to Major Accidents and Disasters is outlined in the Consultation Report submitted with the DCO which outlines the matters raised within consultee responses to the Scoping Report and key themes raised during statutory consultation and how these have been addressed through the ES. **Table 15-10** below provides a summary of the key consultation in relation to Major Accidents and Disasters.

Table 15-10: Major accidents and disasters consultation comments and responses

Consultee	Matter Raised	Response
National Grid Gas (NGG)	NGG has two high pressure (major accident hazard pipelines) located either within the Order limits or in close proximity to the order boundary. These pipelines form an essential part of the gas transmission network in England and Wales.	These pipelines have been accounted for in the design of the Proposed Development and measures to ensure their protection are set out in the oCEMP .
Health and Safety Executive	The south eastern part of the site does have a major hazards pipeline running through the site. Therefore any location of people within the area will need to be considered also any construction work in the vicinity of the pipeline will need notification to the relevant operator and permission sought before work proceeds.	These pipelines have been accounted for in the design of the Proposed Development and measures to ensure their protection are set out in the oCEMP .
Health and Safety Executive	Reviewed to see what is the major hazards site shown and it seems that the 3Z map relates to Hey Group T/A Stamford Storage (H1909) which give the following: “No longer storing Hydrogen Sulphide - 25 October 2005. Cross boundary with South Kesteven Oct 2020 AN survey reveals that this site no longer stores AN – no info re other substances stored so consent remains for other substances”	The COMAH Sites section below and the Emergency Response Plan prepared as part of the CEMP (secured by the oCEMP) will set out the emergency response measures that will be in place in the event of an accident at these sites.

Assessment of Potential Effects and Mitigation

15.5.5. The Proposed Development does not introduce any construction or operational uses or procedures that are considered to have a risk of major accident or disasters that could affect existing or future sensitive receptors or which are not considered through existing regulatory regimes. Examples of such regimes include:

- a. Building Regulations;
- b. NHS England Emergency Preparedness;
- c. Resilience and Response Framework;
- d. Health and Safety at Work Act 1974;

- e. Safety at Work Regulations 1999;
- f. CDM Regulations 2015;
- g. Railway Operator Regulatory Requirements; and
- h. 999 emergency service response procedure and call/response procedure to report utility system failures.

15.5.6. The paragraphs below provide a brief description of potential major accidents and/or disasters, which are considered relevant to the Proposed Development.

Transport Accidents

- 15.5.7. The Proposed Development will increase the amount of traffic on the public highway during the construction, operational and decommissioning phases. However, **Chapter 9: Highways and Access** of the ES shows that the construction phase of the Proposed Development would have a non-significant effect with regards to accidents and safety on the highway network.
- 15.5.8. Effects from glint and glare to road, rail and aircraft users are considered in **Section 15.4** of this chapter, and mitigation measures have been identified and incorporated into the design of the Proposed Development, where necessary. The assessment concludes that effects would not be significant.

Flooding

- 15.5.9. Both the vulnerability of the Proposed Development to flooding, and its potential to exacerbating flooding has been assessed in the **Flood Risk Assessment (FRA)** at **Appendix 11.5**, and **Chapter 11: Water Resources and Ground Conditions** of the ES to ensure that the Proposed Development is safe from water ingress for its lifetime in the event of flooding, without increasing flood risk elsewhere. The **FRA** concludes that the risk of the Proposed Development flooding (including an allowance for climate change) from all potential sources of flooding is negligible and not

significant and that the increased flood risk as a result of the Proposed Development would be negligible and not significant.

Fire

- 15.5.10. Health and Safety onsite would be managed by the contractor during construction and decommissioning to mitigate the risk of fire in line with legislative safety requirements such as the Regulatory Reform (Fire Safety) Order 2005 [Ref 15-8] and the CDM Regulations 2015 [Ref 15-9]. The **oCEMP** and **oDEMP** include measures that prohibit the burning of waste material onsite. The Proposed Development therefore is not expected to have a significant effect on the environment due to the risk of a major accident occurring as a result of fire during construction and decommissioning.
- 15.5.11. The operational phase of the Proposed Development would involve routine maintenance and servicing of equipment to ensure the safe operation of equipment. Fire equipment and notices will also be provided onsite for the availability of personnel and would be regularly inspected and serviced in accordance with Regulatory Reform (Fire Safety) Order 2005. The **oOEMP** secures the preparation of an Emergency Response Plan as part of the OEMP. No significant effects are anticipated following implementation of the Emergency Response Plan.

COMAH Sites

- 15.5.12. Three active Upper Tier Control of Major Accident Hazards (COMAH) sites are recorded within the Essendine Industrial Estate, all registered to The Heys Group Ltd. A Notification of Installations Handling Hazardous Substances (NIHHS) is also registered to Stamford Storage Limited within the industrial estate but is 'Not Active'. Planning Hazardous Substances Consents have also been granted to Stamford Storage and Baxters Warehousing Peterborough Ltd within Essendine Industrial Estate.
- 15.5.13. The main types of major accident scenarios associated with these COMAH sites are:

- a. Liquid release - liquid flowing on-site and off-site to sewer, freshwater, estuarine waters, coastal waters, land or groundwater. Damage to people and the environment. Environmental pollution and contamination of drinking water supplies.
- b. Release of contaminated fire water containing dangerous substances - to sewer, freshwater, estuarine waters, coastal waters, land or groundwater.
- c. Toxic gas or smoke - a gas cloud or smoke plume (includes ecotoxic smoke) containing dangerous substances.

15.5.14. The COMAH site has prepared an internal emergency plan to deal with major accidents and has liaised with the emergency services in order to deal with major accidents and to minimise their effects.

15.5.15. This plan indicates that advice about the action to take in the event of a major accident will be given by local radio/TV station. If a major accident occurs members of the public who may be affected will be warned by an intermittent tone from the COMAH site siren. Members of the public who may be affected should remain indoors until they hear the all-clear signal or receive instructions from the police. As such, no impacts are anticipated to arise from major accidents and disasters to this COMAH site to construction or operational staff for the Proposed Development.

15.5.16. The CEMP and DEMP will provide details of the COMAH site and the emergency response required in the event of an accident. This will involve stopping works, evacuating personnel from the affected area and consulting emergency services for advice. In the event that soils, vegetation and watercourses were contaminated during an accident associated with the COMAH site the Environment Agency and geo-environmental specialists would be consulted to inform any changes to the LEMP. This would include changes to the controls around the disposal of vegetation waste associated with maintenance activities such as vegetation management.

Major Accident Pipelines

- 15.5.17. NGG has two high pressure (major accident hazard pipelines) located either within the Order limits or in close proximity to the Order limits boundary:
- a. Feeder Main 9 – Kirkby Underwood to Tallington; and
 - b. Feeder Main 22 – Aslackby to Braceborough.
- 15.5.18. NGG has existing easements for these pipelines which provides rights for ongoing access and prevents the erection of permanent / temporary buildings/structures, change to existing ground levels or storage of materials etc within the easement strip.
- 15.5.19. NGG's 'Guidance for developing solar farms near to gas distribution and transmission pipelines' [Ref 15-10] will be followed and Protective Provisions for NGG's benefit are included within the DCO.

Electromagnetic Fields

- 15.5.20. The Grid Connection Cable and Onsite Substation, which form a part of the Proposed Development, exceed 132kV and therefore have the potential to cause electromagnetic fields with potential for adverse effects on human health. The Grid Connection Cable will be buried underground at a suitable depth and the Onsite Substation will be set back from Uffington Lane and designed in accordance with relevant guidance (DECC Power Lines: Demonstrating compliance with EMF public exposure guidelines, A Voluntary Code of Practice 2012) [Ref 15-11]. Therefore, electromagnetic fields are unlikely to have any adverse effects on residential receptors.

Plant Disease

- 15.5.21. The establishment, monitoring and protection of the proposed planting within the layout of the Proposed Development is contained within the ***oLEMP***. Measures for the establishment and care for the new plants is outlined below to ensure their best chance of survival and longevity.
- 15.5.22. All new planting should be sourced from a reputable UK based provider who are able to demonstrate provenance of planting and adhere to all

relevant biohazard controls including LI Technical Note 1/15 Pests and Disease Threats [Ref 15-12].

- 15.5.23. All new planting must be certified disease and pest free from the chosen supplier(s).
- 15.5.24. Planting to be undertaken in suitable planting conditions.
- 15.5.25. All new tree planting will be undertaken in accordance with the BS8545:2014 'Trees: from Nursery to Independence in the Landscape – Recommendations' document.

Cumulative Effects

- 15.5.26. Increased traffic during construction and decommissioning of the Proposed Development, in combination with other developments, could result in a greater risk of road accidents. This risk is assessed in **Chapter 9: Highways and Access**, of this ES. The assessment concludes that the cumulative effect would not be significant.
- 15.5.27. It is not anticipated that any cumulative schemes would increase the risk of severity of the effects associated with major accidents and / or disasters affecting the Proposed Development or caused by the Proposed Development. Should any significant effects occur, these would be as a result of the other developments, either in isolation or in combination with each other, with the Proposed Development providing at worst a negligible contribution to this cumulative effect. The interaction of effects is set out in **Chapter 16: Interaction of Effects and Cumulative Effects**, of this ES [EN010127/APP.6.1].

15.6. Utilities

Introduction

- 15.6.1. This section evaluates the effects of the Proposed Development on telecommunication infrastructure, television reception and existing utilities.

Consultation Responses

15.6.2. Consultation undertaken to date in relation to utilities is outlined in the Consultation Report submitted with the DCO application. **Table 15-11** outlines the matters raised within consultees responses to the Scoping Report and the key themes raised during statutory consultation and how these have been addressed through the ES.

Table 15-11: Consultations matters and responses for utilities

Consultee	Matter Raised	Response
Cadent Gas	Where diversions of apparatus are required to facilitate the scheme, Cadent will require adequate notice and discussions should be started at the earliest opportunity. Diversions for high-pressure apparatus can take in excess of two years to plan and procure materials.	No diversions are required to facilitate construction of the Proposed Development. Discussions have been progressed with regard to Protective Provisions required to safeguard assets in proximity to works areas indicated on the Works Plan.
NGG	NGG has two high pressure (major accident hazard pipelines) located either within the Order limits or in close proximity to the order boundary. These pipelines form an essential part of the gas transmission network in England and Wales.	These pipelines have been accounted for in the design of the Proposed Development and measures to ensure their protection are set out in the oCEMP .
National Grid Electricity Transmission (NGET)	NGET are keen to understand the clearance distances of the solar farm apparatus from the NGET assets and the proposed access and other arrangements to enable NGET to continue to maintain their apparatus where it is in proximity to the proposed development.	As secured through the Works Plans , no PV Arrays or Solar Stations are located within 20m of NGET assets.
Northern Powergrid	They received the consultation documents, however, do not believe that there is any Northern Powergrid land or assets within the DCO boundary. Please can this be confirmed.	It is confirmed that there are no Northern Powergrid land or assets within the Order limits.
Sky Telecommunications	Please be advised, Sky Telecommunications Services Ltd will not be affected by the proposal, and therefore have no comments.	Noted
National Grid Electricity Distribution (East Midlands) Plc	Requested meeting to discuss potential impacts upon and access to overhead line assets	Applicant confirmed that suitable offsets included in layout of the Proposed Development as indicated in the Green

Consultee	Matter Raised	Response
		<p>Infrastructure Strategy Plan include in the oLEMP to allow for access and maintenance of overhead line assets.</p> <p>Discussions have been progressed with regard to Protective Provisions required to safeguard assets in proximity to works areas indicated on the Works Plans.</p>
Anglian Water	Requested meeting to discuss potential impacts upon underground line assets.	<p>Applicant confirmed that suitable offsets included in layout of the Proposed Development as indicated in the Green Infrastructure Strategy Plan include in the oLEMP.</p> <p>Discussions have been progressed with regard to Protective Provisions required to safeguard assets in proximity to works areas indicated on the Works Plans.</p>

Assessment Methodology

- 15.6.3. To identify any existing infrastructure constraints, both consultation and a desk-based study has been undertaken. Consultation with relevant utilities providers is a routine part of the design process. Consultees include water, gas and electricity providers and telecommunications providers. Telecommunications and television providers are unlikely to be affected by Electromagnetic Interference unless transmitters are near electrical infrastructure associated with the PV array. A desk-based search has been undertaken for the presence of telecommunications, television reception and utilities infrastructure within the Order limits and within the vicinity. A qualitative approach is used to assess the likelihood of significant effects on telecommunications, television reception and utilities.
- 15.6.4. Utilities consultation has been and will continue to be undertaken with the following organisations:

- a. National Grid Electricity Transmission (NGET);
- b. Environment Agency;
- c. National Grid Gas (NGG);
- d. Anglian Water;
- e. Western Power Distribution; and
- f. Cadent Gas Ltd.

15.6.5. Knowledge of the utilities during design and construction allows any potential effects to be negated by avoiding them or by use of suitable structures, such as pipe bridges.

15.6.6. Through consultation and a desk-based search of existing datasets, the following utilities and infrastructure have been identified which have the potential to be affected by the Proposed Development:

- a. Feeder Main 9 – Kirkby Underwood to Tallington;
- b. Feeder Main 22 – Aslackby to Braceborough;
- c. Cadent High-Pressure Pipeline;
- d. Anglian Water sewer;
- e. Western Power Distribution - Electricity - Services – Underground;
- f. Western Power Distribution - Electricity - LV – Underground;
- g. Western Power Distribution - Electricity - HV (11kV) – Underground;
- h. Western Power Distribution - Electricity - HV (11kV) – Overhead;
- i. National Grid - Electricity – Underground;
- j. National Grid - Electricity – Overhead;
- k. National Grid - Gas - NHP Mains;
- l. National Grid - Gas - LHP Mains;
- m. National Grid / Cadent Gas - Gas – LHP Mains;
- n. National Grid - Gas - IP Mains;

- o. National Grid / Cadent Gas - Gas - IP Mains;
- p. National Grid / Cadent Gas - Gas - LP Mains;
- q. National Grid / Cadent Gas - Gas - LP Mains;
- r. National Grid - Fibre Cables; and
- s. Gigaclear – Cable.

Embedded Mitigation

- 15.6.7. The risk of damage to utilities during construction would be minimised through the detailed design which would avoid where practicable utilities and infrastructure via micro siting of elements of the Proposed Development. The approach can be outlined as follows:
- a. locating the Proposed Development outside of utilities' protected zones (areas within which there is potential for construction works to impact utilities) where practicable;
 - b. the use of ground penetrating radar before excavation to identify any unknown utilities; and
 - c. consultation and agreement of construction/ demobilisation methods prior to works commencing.
- 15.6.8. These measures are secured by the **oCEMP** which would inform the preparation of a CEMP which would include further details on avoiding the risk of damage to utilities.
- 15.6.9. Consultation has been undertaken with Cadent Gas and National Grid in order to carefully identify the easement corridors required to avoid the gas pipelines running through the Order limits. These measures would reduce the likelihood of effects on utilities during construction. Engagement is also ongoing with all statutory undertakers with apparatus that has potential to be affected by the Proposed Development to agree protective provisions to be included in the DCO.

- 15.6.10. If any excavations are planned within 3m of a High-Pressure Pipeline or, within 10 metres of an AGI (Above Ground Installation), or if any embankment or dredging works are proposed then the actual position and depth of the pipeline must be established on site in the presence of a Cadent/National Grid representative. A safe working method would be agreed prior to any work taking place in order to minimise the risk of damage and ensure the final depth of cover does not affect the integrity of the pipeline. This will be secured pursuant to Cadent's and National Grid's protective provisions in the DCO.
- 15.6.11. Similarly, the DCO also includes protective provisions for the protection of electronic communication networks and utilities (owned/operated by Western Power Distribution and Gigaclear) and sewer infrastructure (owned/operated by Anglian Water).
- 15.6.12. The Grid Connection Cable and the Onsite Substation have been designed in accordance with relevant guidance and electrical utility stakeholders have been consulted to ensure that the siting of these elements of the Proposed Development are sufficiently distanced from other sensitive infrastructure.
- 15.6.13. Decommissioning works would be undertaken within the footprint excavated during construction. The embedded mitigation measures used during construction would also apply during decommissioning.

Potential Effects

Telecommunications

- 15.6.14. Mobile telecommunications masts are not expected to be affected by the Proposed Development, given the low-lying nature of the Proposed Development and the lack of potential for it to form a barrier between the mast and any receiving station. Therefore, the Proposed Development is not anticipated to interfere with telecommunications infrastructure and no effects are anticipated in the construction, operation, and decommissioning phases.

Television Reception

15.6.15. The Proposed Development consists of low-lying infrastructure and is therefore unlikely to interfere with digital television signals and therefore no effects are anticipated in the construction, operation, and decommissioning phases.

Utilities

15.6.16. The embedded mitigation outlined above is considered sufficient to avoid any adverse effects during construction and decommissioning through damage caused as a result of excavation and engineering operations.

15.6.17. No adverse effects relating to below-ground works are predicted as a result of the operational phase of the Proposed Development because no excavation activities will take place.

15.6.18. The embedded mitigation is considered sufficient to avoid potential electromagnetic interference on other electrical infrastructure associated with the Grid Connection Cable and Onsite Substation.

Cumulative Effects

15.6.19. 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 developments 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.

15.7. Waste

Introduction

- 15.7.1. This section discusses the expected waste streams during each phase of the Proposed Development and assesses the likely effects that may arise from waste as a result of the Proposed Development.
- 15.7.2. The legal definition of waste is “*any substance or object which the producer discards or intends or is required to discard*” [Ref 15-13]. The legal definition of waste also covers substances or objects, which fall outside of the commercial cycle or out of the chain of utility. In particular, most items that are sold or taken off site for recycling are wastes, as they require treatment before they can be resold or reused.
- 15.7.3. In practical terms, wastes include surplus spoil, scrap, recovered spills, unwanted surplus materials, packaging, office waste, wastewater, broken, worn-out, contaminated or otherwise spoiled plant, equipment and materials.

Relevant Legislation, Guidelines and Policy

- 15.7.4. The Waste Framework Directive 2008/98/EC [Ref 15-14] provides a framework for the management of waste across the European community. The revised Directive (2018) [Ref 15-15] introduced new provisions in order to boost waste prevention and recycling as part of the Waste Hierarchy. All Member States of the EU are required to adopt this approach.
- 15.7.5. The Waste (England and Wales) Regulations 2011 (as amended) [Ref 15-16] transposed the Waste Framework Directive 2008/98/EC into domestic law in England and Wales and require waste prevention programmes and waste management plans that apply the Waste Hierarchy. The main principles of the Waste Hierarchy are summarised in Plate 15-1. The Waste Hierarchy will be adopted throughout the construction, operation and decommissioning phases of the Proposed Development.

Plate 15-1: The Waste Hierarchy



- 15.7.6. The requirement originally under Section 34 of the Environmental Protection Act 1990 [Ref 15-17] and in the Waste (England and Wales) Regulations 2011 (Amended 2014) places a duty on producers and holders of waste to:
- Prevent illegal disposal, treatment or storage of waste;
 - Handle their waste safely;
 - Know whether the waste is hazardous or non-hazardous;
 - Store waste securely in a manner that prevents release of the waste;
 - Provide an accurate written description of the waste in order to facilitate the compliance of others with the Duty and avoidance of the offences under Section 33 of the Environmental Protection Act 1990: via a compulsory system of Controlled Waste Transfer Notes (WTNs) which controls the transfer of waste between parties; and
 - Ensure anyone dealing with their waste has the necessary authorisation.
- 15.7.7. The Hazardous Waste Regulations (England and Wales) 2005 (amended in 2016) [Ref 15-18] places a requirement on the producer of the waste to:
- Classify the waste;
 - Separate hazardous waste from other general waste streams;
 - Use authorised businesses to collect, recycle or dispose of your waste;
- and

- d. Complete relevant hazardous waste consignment note.
- 15.7.8. Under the Control of Pollution Act 1974 (as amended) [Ref 15-19], it is a criminal offence for anyone not registered as a carrier, to transport Controlled Waste.
- 15.7.9. Once appointed, details of the waste carriers and contractors will be included in the Construction Resource Management Plan (CRMP) including copies of appropriate licences. Waste carrier licences will be reviewed prior to works commencing. The CRMP will be finalised prior to the start of construction, pursuant to the **oCEMP**.
- 15.7.10. Paragraph 5.15.7 of the Draft National Policy Statements (EN-1) states: “Where possible, applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers. Construction best practices should be used to ensure that material is reused or recycled onsite where possible”. This is considered in this Section 15.6 and will be further addressed in the CRMP. Details of waste management are also provided in the **oCEMP**.
- 15.7.11. From January 2014, anyone undertaking the following activities as part of their business must register as a waste carrier, broker or dealer to [Ref 15-20]:
- a. Transport their own waste;
 - b. Transport or dispose of waste for someone else;
 - c. Buy or sell waste; or
 - d. Act as a waste broker (arrange for someone to handle other people’s waste).
- 15.7.12. Lincolnshire Minerals and Waste Local Plan 2016 [Ref 15-21] and the Minerals Core Strategy and Development Control Policies Development Plan Document 2010 [Ref 15-22] set out the key principles to guide the future winning and working of minerals and the form of waste management development in the respective counties. They also set out the development

management policies against which planning applications for minerals and waste development will be considered.

Embedded Mitigation

- 15.7.13. The commercial nature of the waste to be produced during construction, operation and decommissioning will mean it will be managed by appropriately permitted carriers and facilities in line with the appropriate environmental permits and requirements. The waste carriers and landfill sites used will be determined by the contractor prior to construction and decommissioning.
- 15.7.14. A Construction Resource Management Plan (CRMP) and Decommissioning Resource Management Plan (DRMP) (as secured by the **oCEMP** and **oDEMP**) will be prepared for the construction and decommissioning phases on the basis of the outline environmental management plans that form part of the DCO. These include measures to control and manage waste onsite.
- 15.7.15. All waste transported off-site will be delivered to the appropriately licenced receivers of such materials. Operators receiving any waste materials resulting from the Proposed Development will be subject to their own consenting procedures.
- 15.7.16. Prior to construction, opportunities to minimise waste produced through the construction phase as far as possible will be explored. Possibilities to re-use or recycle materials will be explored before resorting to landfill options.
- 15.7.17. Solid waste materials generated during construction will be segregated and stored onsite in containers of up to 30m³ capacity prior to transport to an approved, licensed third party landfill and recycling facilities. The HGV movements associated with the removal of waste from the Order limits have been assessed in **Chapter 9: Highways and Access** of the ES.
- 15.7.18. Re-usable waste includes soil excavated for trenches, roads, compound areas and foundations. These will be re-used on-site where possible. Toxic and/or hazardous waste must be treated by an authorised operator. Transportation of hazardous waste will also require an authorised carrier.

Materials are to be dealt with in accordance with the aforementioned environmental management plans.

- 15.7.19. During decommissioning the PV Arrays and related components, Ancillary Infrastructure and Onsite Substation will be removed and recycled or disposed of in accordance with good practice and market conditions at that time.
- 15.7.20. The underground cable within the Grid Connection Route would be either left in-situ or removed and the ground reinstated.
- 15.7.21. Prior to decommissioning, opportunities to minimise waste as far as possible will be explored. Possibilities to re-use or recycle materials will be explored before resorting to landfill options. There is a new industry emerging for recycling solar panels. This would be explored, in addition to any resale of any operational panels. Waste during the decommissioning phase will be dealt with as part of the DRMP, and in line with relevant legislation and guidance at that time.

Assessment of Potential Effects

Construction Phase

- 15.7.22. The majority of construction equipment will be delivered to the Order limits for assembly and installation (mounting structures) and connection (solar panels).
- 15.7.23. Given the nature of the Proposed Development, significant quantities of waste are not anticipated. The types of waste streams and vehicles associated with the removal of waste material during construction is summarised in **Table 15-12**.

Table 15-12: Waste arisings during construction

Waste	Destination
Metals (aluminium, iron and steel)	Recycling or recovery of metals and metal components

Waste	Destination
Mixed construction / demolition wastes that do not contain hazardous substances	Recycling plant / Landfill for Construction and Demolition Waste
Cables that do not contain hydrocarbons, coal tar or other hazardous substances	Recycling plant
Plastic	Recycling plant
Paper and cardboard containers	Recycling plant
Wood	Recycling plant
Absorbents, cleaning cloths	Authorised recycling plant or authorised landfill for hazardous waste
Aerosol sprays	Authorised recycling plant or authorised landfill for hazardous waste
Land and stones containing hazardous substances	Authorised recycling plant or authorised landfill for hazardous waste
Empty containers of contaminated metal or plastics	Authorised recycling plant or authorised landfill for hazardous waste
Used oils	Authorised recycling plant or authorised landfill for hazardous waste
Oil filters	Authorised recycling plant or authorised landfill for hazardous waste

15.7.24. With the embedded mitigation in place and the appropriate control measures followed, no significant effects associated with this waste are anticipated

Operational Phase

15.7.25. During the operational phase of the Proposed Development there will be up to four permanent staff. Waste arisings are expected to be minimal, and would include:

- a. Welfare facility waste;
- b. Equipment needing replacing;

c. Waste metals; and

d. General waste (paper, cardboard, wood, etc.).

15.7.26. During the operational phase of the Proposed Development, waste arisings including those generated by component replacement are expected to be minimal and as they would be considered to be commercial waste this will be managed by appropriately permitted carriers and facilities in line with the appropriate environmental permits and requirements. It is therefore not anticipated to result in a significant effect.

Decommissioning Phase

15.7.27. The Applicant is not seeking a time limited consent. The operational life of the Proposed Development has not been specified within the DCO Application. However, it is recognised that the electrical infrastructure will have an operational lifespan, as such, for the purposes of assessing decommissioning with the ES, it has been assumed that the Proposed Development has a 40-year operational life span to enable an assessment of decommissioning to be carried out. The operation assessment does not assume that the operational phase will be limited to 40 years as the solar infrastructure may continue to be operating successfully and safely beyond this period.

15.7.28. Whilst the Applicant is not seeking a time limited consent, it is expected that during the operational phase of the Proposed Development, onsite activities would include routine servicing, maintenance and replacement of solar equipment as and when required, as well as management of vegetation. Any solar equipment that requires to be replaced during the operational period will be disposed of following the waste hierarchy, with materials being reused or recycled wherever possible. Any electrical waste will be disposed in accordance with the Waste from Electrical and Electronic Equipment (WEEE) regulations, minimising the environmental impact of the replacement of any elements of the Proposed Development.

- 15.7.29. All the solar infrastructure including PV modules, mounting structures, cabling on or near the surface, inverters, transformers, switchgear, fencing and ancillary infrastructure and the Onsite Substation would be removed and recycled or disposed of in accordance with good practice following the waste hierarchy, with materials being reused or recycled wherever possible. All waste will be disposed of in accordance with the legislation at the time of decommissioning.
- 15.7.30. Waste streams during decommissioning could include:
- a. Solar PV panels and mounting structures;
 - b. Waste materials from foundations;
 - c. Electrical equipment;
 - d. Cables;
 - e. Welfare facility waste;
 - f. Waste chemicals, fuels and oils;
 - g. Waste metals;
 - h. Waste water from dewatering of excavations; and
 - i. Waste water from cleaning activities (e.g. wheelwash).
- 15.7.31. The effects of decommissioning are similar to, or often of a lesser magnitude than construction effects and will be considered in the relevant sections of the ES. However, there can be a high degree of uncertainty regarding decommissioning as engineering approaches and technologies are likely to change over the operational life of the Proposed Development.
- 15.7.32. With the embedded mitigation in place the effects relating to waste generated during decommissioning are set out within the oDEMP and are anticipated to be not significant.

Cumulative Effects

- 15.7.33. A long list of cumulative developments is presented in **Appendix 2.4** of the ES [EN010127/APP/6.2]. Cumulative effects may occur from increased

HGVs transporting waste to recycling plants and landfill. This is assessed in **Chapter 9: Highways and Access** of the ES. The Joint Municipal Waste Strategy for Lincolnshire, 2019 [Ref 15-23] considers the waste needs of the county (reviewed on an annual basis) and considers allocated sites and other forms of strategic development, therefore consideration has been made at the regional level for the cumulative waste generated by these developments. It is also assumed that each of the cumulative developments will also be considering and implementing the waste hierarchy. Therefore, no significant effects of a cumulative nature are anticipated.

- 15.7.34. Should any significant effects occur, these would be as a result of the other developments, either in isolation or in combination with each other, with the Proposed Development providing at worst a negligible contribution to this cumulative effect. The interaction of effects is set out in **Chapter 16: Interaction of Effects and Cumulative Effects**, of this ES [EN010127/APP.6.1].

15.8. References

- Ref 15-1 Institute of Air Quality Monitoring (IAQM) (2016). Guidance on the assessment of dust from demolition and construction.
- Ref 15-2 British Standards Institute (BSI) (2012). British Standard (BS) 5837:2012 '*Trees in relation to design, demolition and construction. Recommendations*'
- Ref 15-3 Natural England and Forestry Commission (2022). Ancient woodland, ancient trees and veteran trees: advice for making planning decisions.
- Ref 15-4 Department for Business, Energy & industrial Strategy (2021). Draft National Policy Statement for Renewable Energy Infrastructure (EN-3).
- Ref 15-5 Cabinet Office (2017). National Risk register of Civil Emergencies.
- Ref 15-6 Cabinet Office (2013). Guidance: Emergency Response and Recover
- Ref 15-7 Institute of Environmental Management and Assessment (IEMA) (2020). Major Accidents and Disasters in EIA: A Primer.
- Ref 15-8 UK Government (2005). The Regulatory Reform (Fire Safety) Order 2005.
- Ref 15-9 UK Government (2015). Construction Design and Management (CDM) Regulations 2015.
- Ref 15-10 National Grid (n.d.) Guidance for developing solar farms near to gas distribution and transmission pipelines.
- Ref 15-11 Department of Energy and Climate Change (2012) Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice.
- Ref 15-12 Landscape Institute (2015) pest and disease threat to plans: technical Information Note 01/2015.
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- Ref 15-14 European Parliament (2008). Waste Framework Directive 2008/98/EC
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