THE DROVES
SOLAR FARM

The Droves Solar Farm

Chapter 16: Other Environmental Matters (Clean)

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Date: October 2026
PINS reference: EN0110013
Document reference: APP/6.2.2 (Revision 2)
APFP Regulation Reg 5(2)(a)
Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009



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16 Other Environmental Matters

16.1 Introduction

16.1.1 This chapter of the Environmental Statement (ES) presents the findings of the Environmental Impact Assessment (EIA) of effects on Other Environmental Matters (OEM) as a result of the Scheme.

16.1.2 The purpose of this chapter is to collate the other environmental topics that do not warrant individual chapters in the ES, either due to the brevity of the assessment, or lack of likely significant effects.

16.1.3 The following aspects have been addressed:

- Air Quality
- Arboriculture
- Glint and Glare
- Electromagnetic Fields
- Telecommunications, Utilities and Television receptors; and
- Waste

16.1.4 The information presented within this chapter has been informed by the Scheme information provided in **ES Chapter 5: The Scheme [APP/6.1]**.

16.1.5 This OEM chapter has been prepared by LDA Design, Hoare Lea, Seed Arboriculture Limited, Pager Power and Lanpro (See **ES Appendix 1.1: Statement of Competence [APP/6.4]**).

16.1.6 For the topics covered in this chapter, bar that of Section 16.9 Waste, the majority of assessments of potential effects do not follow the approach and methodology outlined in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**. The purpose of this chapter is to provide a high-level assessment of other environment topics where a full chapter adhering to the **ES Chapter 2: EIA Process and Methodology [APP/6.1]** is not considered necessary. Within this chapter, the alternative methodology used is clearly outlined for each topic. As mentioned, the Waste assessment contained within Section 16.9 Waste follows the approach outlined in in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**.

16.1.7 This document has been updated, in respect of the Glint and Glare and Waste sections only, at Deadline 6 to consider the Longmarsh Green Energy project, for which the EIA Scoping Report was submitted to PINS in October 2026, in relation to the cumulative assessment of the Scheme. This demonstrates the proactive and robust nature of the Applicant's cumulative assessment, even though the information for Longmarsh Green Energy has been received

at a late stage of the Examination. The document references have not been updated from the original submission. Please refer to the **Guide to the Application [APP/1.3.8]** for the list of current versions of documents.

16.2 Consultation

Scoping Opinion

16.2.1 On 8 November 2024, the Applicant submitted a Scoping Opinion Request to the Planning Inspectorate (PINS) (see **ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4]**) in support of a request for a Scoping Opinion from PINS on behalf of the Secretary of State (SoS) pursuant to Regulation 10 of the EIA Regulations.

16.2.2 A Scoping Opinion (see **ES Appendix 2.2: Scoping Opinion [APP/6.4]**) was issued by PINS on 18 December 2024.

16.2.3 The issues raised in the Scoping Opinion relating to other environmental matters are summarised and responded to within **ES Appendix 16.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]** which demonstrates how the matters raised in the Scoping Opinion are addressed in this ES.

Statutory Consultation and Preliminary Environmental Information Report (PEIR)

16.2.4 Statutory consultation was held between 21 May 2025 and 9 July 2025. Relevant responses to the PEIR relating to OEM and how these have been addressed through the ES are set out within **ES Appendix 16.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]**.

16.2.5 A further round of targeted consultation was undertaken between 3 September 2025 and 1 October 2025 following changes to the development boundary area of the Scheme presented in the PEIR and during Stage Two Statutory Consultation. Further detail regarding the targeted consultation is provided in **ES Chapter 1: Introduction [APP/6.1]**.

16.3 Legislation, Planning Policy and Guidance

16.3.1 A summary of applicable legislation, planning policy and other guidance documents against which the Scheme will be considered relating to OEM is set out in **ES Appendix 16.1: Consultation and Legislation, Planning Policy and Guidance [APP/6.4]**.

16.4 Air Quality

Introduction

16.4.1 This section discusses potential Air Quality impacts arising as a result of the Scheme. As set out in **ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4]**, it was proposed to scope out effects on air quality receptors due to the lack of potential for likely significant effects. In Section 3.5 of **ES Appendix 2.2: Scoping Opinion [APP/6.4]**, PINS confirmed that air quality effects are not likely to be significant, on the basis that the following information is provided in the ES:

- A statement, supported by information on expected vehicle movements and the locations of the nearest sensitive receptors, as to why effects during construction and decommissioning would not be significant
- Demonstration that the traffic flows during construction will be beneath the Environmental Protection United Kingdom (EPUK) and Institute for Air Quality Management (IAQM) thresholds for further assessment
- Confirmation of the type, quantity, use and duration of the NRMM used during the construction and decommissioning phases
- Provide justification for the Study Area with reference to guidance for ecological receptors
- Include a plan showing the extent of the final Study Area, including proposed construction routes and the location of receptors; and
- Ensure strategic mitigation for air pollution is taken into account throughout the design.

16.4.2 This section discusses the above requirements and should be read in conjunction with the **oCEMP [APP/7.6]**.

Assessment Methodology

Study Area

16.4.3 Justification for the Study Area, including the Study Area extent figure showing proposed construction routes, receptor locations (human and ecological) has been provided in **Figure 1.1 and 1.2 of the Construction and Decommissioning Phase Dust Assessment [APP/7.6],** appended to the **oCEMP [APP/7.6]**.

Construction Phase Dust Assessment

16.4.4 Dust emissions associated with construction activities will be controlled through mitigation measures outlined in the **oCEMP [APP/7.6]**. Based on the assessed risk, suitable mitigation measures have been proposed based on the IAQM Assessment of Dust from Demolition and Construction 2024 V2.2 guidance, as presented in Table 16-1.

16.4.5 With the inclusion of the mitigation outlined in the **oCEMP [APP/7.6]**, potential dust emissions associated with on-site activities during the construction phase are not anticipated to be significant.

Table 16-1 Mitigation measures to be implemented during the construction phase

Issue	Mitigation measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Dust Management Plan	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the relevant Local Authorities. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.
Site Management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the Local Authority in which the complaint is made when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.
	Hold regular liaison meetings with other high risk construction sites within 250 m of the Order Limits, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the relevant Local Authority when asked. This should include regular dust soiling check of surfaces such as street furniture, cars, window sills within 100m of the site boundary, with cleaning to be provided if necessary.

	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the relevant Local Authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the relevant Local Authority. Where possible, commence baseline monitoring at least three months before work commences on site or, if it is a large site, before work on a phase commences.
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Avoid site runoff of water or mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicles/ machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.
	Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the

	approval of the nominated undertaker and with the agreement of the relevant Local Authority, where applicable).
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car-sharing).
Operation	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials.
Construction	Avoid scrabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Decommissioning Phase Dust Assessment

16.4.6 The mitigation measures presented in Table 16-1 to control the emissions of dust release during the construction phase will also be implemented during the decommissioning phase and outlined in the **outline Decommissioning Strategy (oDS) [APP/7.10]**.

16.4.7 With the inclusion of the mitigation outlined in the **oDS [APP/7.10]**, potential dust emissions associated with on-site activities during the decommissioning phase are not anticipated to be significant.

Construction Phase Vehicle Movements

16.4.8 Vehicle traffic emissions produced during the construction phase, including exhaust and non-exhaust emissions such as brake and tyre wear, as well as measures to minimise dust emissions arising from vehicles entering and leaving the Site, will be controlled through mitigation measures specified in the **outline Construction Traffic Management Plan (oCTMP) [APP/7.7]** submitted in support of the DCO Application. Mitigation measures to have been summarised in Table 16-2 below and are detailed further within the **oCTMP [APP/7.7]** (only measures relevant to air quality have been selected for inclusion).

Table 16-2 Mitigation measures to be implemented during the construction phase

Issue	Mitigation measure
Dust release due to vehicle movement	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in continuous use.
	Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Visually inspect vehicles before re-entering the public highway to ensure they are not carrying dust or debris.
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit.
	Access gates to be located at least 10m from receptors where possible.

	Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being in continuous use.
Exhaust and non-exhaust emissions due to vehicle movements	No on-street parking permitted.
	Construction vehicles to avoid travel during morning and evening peaks, where possible.
	Arrivals and departures from site will be at a pre-agreed time-slot and on agreed routes to avoid traffic disruption to the network.
	Emissions limits in line with the Freight Operators Recognition Scheme to be implemented (to be agreed with key stakeholders).
	No idling engines.
	Encourage use sustainable transport, for example use of shuttle buses and car sharing.

16.4.9 **ES Chapter 9: Transport and Access [APP/6.2]** provides detail of construction vehicle traffic flows and locations of the nearest sensitive receptors associated with the construction and decommissioning phases which do not exceed EPUK and IAQM screening criterion for either sensitive human or ecological receptors. For the purposes of assessment of vehicle movement impacts in this ES, the maximum construction vehicle movements on any single road link are predicted to be 368 two-way LDV AADT movements and 86 two-way HGV AADT movements on the A1065 South, which splits further (50% in each direction) on joining the A47 (no construction traffic is expected to route further south on A1065 Castle Acre Road through Swaffham). As can be seen, the construction traffic vehicle movements do not exceed the screening criteria for detailed assessment on any road link in the local network, as set out in the EPUK and IAQM guidance, which states a threshold of 500 LDVs and/or more than 100 HDVs. The presented construction traffic vehicle movements are representative of peak construction and are expected to be lower for most of the construction phase.

16.4.10 The closest ecological sites to the Site are Castle Acre Common and River Nar Site of Special Scientific Interest (SSSI), Breckland Special Protection Area (SPA) and Breckland Forest SSSI alongside Narborough Railway Embankment SSSI. The IAQM guidance for the assessment of air quality impacts on designated nature conservation sites requires further assessment of ecological receptors located within approximately 50m of the Site or within approximately 200m of any roads currently considered for construction traffic. As shown above, the maximum construction vehicle movements are expected to be below the DMRB criteria of an increase in AADT of 1000 (or 200 HDVs) indicating that further assessment is not required of sensitive ecological receptors.

16.4.11 Given the low number of vehicle movements, as well as the mitigation measures set out in Table 16-2 above with further detail provided in the **oCTMP [APP/7.7]**, emissions associated with construction vehicles during the construction phase are not anticipated to be significant.

Decommissioning Phase Vehicle Movements

16.4.12 It is not expected that vehicle movements associated with the decommissioning phase will exceed the vehicle movements calculated for the construction phase. As a result, the conclusions drawn about construction phase traffic related effects represent a worst-case scenario that will not be exceeded by the decommissioning phase. As such, emissions associated with vehicles movements during the decommissioning phase are not anticipated to be significant.

Non-Road Mobile Machinery (NRMM)

16.4.13 Confirmation that all NRMM used will adhere to the latest emissions standards in line with European regulations (EU 2016/1628) is included in the **oCEMP [APP/7.6]**, submitted in support of the DCO Application. With these measures in place, significant effects as a result of NRMM emissions are not likely.

16.5 Arboriculture

Arboricultural Impact Assessment

16.5.1 An Arboricultural Impact Assessment (AIA) (**ES Appendix 16.4**: **Arboricultural Impact Assessment [APP/6.4]**), has been undertaken to provide an assessment of the potential impacts upon existing trees, groups of trees, woodlands and hedgerows. The AIA provides a baseline survey of existing trees (undertaken between August and October 2025), an assessment of the potential impacts of the Scheme on the existing trees and indicative mitigation and tree protection measures to be incorporated at the detailed design stage.

16.5.2 Tree surveys recorded a total of 547 individual trees, 157 groups of trees, 24 woodlands and 91 hedgerows were recorded within the Site. Within this total, 39 trees were assessed as veteran.

16.5.3 The AIA (**ES Appendix 16.4**: **Arboricultural Impact Assessment [APP/6.4]**) has considered the potential impacts of the Scheme upon existing trees, tree groups, woodlands and hedgerows. Design and mitigation measures, design principles and commitments for the avoidance or mitigation of impacts have been built into the Scheme. A summary of the embedded design mitigation measures considered in the AIA (**ES Appendix 16.4**: **Arboricultural Impact Assessment [APP/6.4])** are set out in Table 6.1 of the AIA which are secured by the **Design Principles, Parameters and Commitments [APP/5.8], outline Landscape and Ecology Management Plan (oLEMP) [APP/7.11]** and **outline Construction Environmental Management Plan (oCEMP) [APP/7.6**]. These can be summarised as below:

- Buffers to Solar PV Arrays, Access Tracks and fencing:
  - Hedgerows – 8m
  - Hedges with tress – 10m
  - Woodland (non-ancient) – 15m
  - Individual trees and groups of trees – 10m (unless otherwise specified by arboricultural consultant)
  - Non-Statutory Designated sites and Local Wildlife sites – 10m; and
  - Veteran and Ancient trees – 15x width of tree stem diameter.
- Preparation of an Arboriculture Method Statement as part of the detailed CEMP; and
- General mitigation measures relating to tree removal, tree pruning, root loss/damage from excavation or soil compaction within Root Protection Areas (RPAs), dust/sediment impacts to adjacent woodland and damage to canopies/stems from machinery movements

Conclusion

16.5.4 As concluded in **ES Appendix 16.4**: **Arboricultural Impact Assessment [APP/6.4]** there is potential for removal and partial removal of trees/groups of trees, woodland and hedgerows. Removals are considered to represent as worst-case scenario, with tree removal avoided wherever practicable as set out in the oCEMP **[APP/6.7]**. Part removal of tree groups is minor in nature and relate predominantly to crossings for Access Tracks. The AIA has identified impacts to RPAs arising predominantly from proposed Access Tracks. Design and mitigation measures within the **oCEMP [APP/6.7]** and commitments within the **Design Principles, Parameters and Commitments [APP/5.8]** outline a range of mitigation measures to avoid and mitigation impacts to PRAs, such as buffer zones and ground protection.

16.5.5 As summarised in the AIA (see **ES Appendix 16.4**: **Arboricultural Impact Assessment [APP/6.4]** a detailed Arboricultural Method Statement (AMS) will be prepared at the detailed design stage to further set out tree protection measures in response to design and existing embedded mitigation. Furthermore, from the outset of the Scheme the Applicant has afforded arboriculture considerations into the design process, evidenced during the site selection and assessment process, this is detailed further in the **Planning Statement [APP/5.5].**

16.5.6 Therefore, it is considered that significant effects as a result of the Scheme in respect of arboriculture can be avoided and/or mitigated through embedded design mitigation measures as set out in **ES Appendix 16.4: Arboricultural Impact Assessment [APP/6.4].**

16.6 Glint and Glare

Introduction

16.6.1 As set out in **ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4]** and agreed by PINS in **ES Appendix 2.2: Scoping Opinion [APP/6.4]**), an individual glint and glare chapter is not required in the Environmental Statement (ES) However, glint and glare effects in respect of those matters that are scoped in are covered in this chapter for the following receptors:

- Dwellings within the 1km Study Area (44 dwelling receptors)
- Non-Local Road Infrastructure within the 1km Study Area (sections of the A47 and A1065)
- RAF Marham and Great Friars Thornes Farm Airfield
- East Winch Airfield and Great Massingham Airfield (aviation infrastructure outside of the 5km and 10km Study Areas)
- Public Rights of Way (PRoW) and Bridleways; and
- Cumulative Assessment.

16.6.2 As agreed with PINS (**ES Appendix 2.2: Scoping Opinion [APP/6.4]**), East Winch Airfield and Great Massington Airfield and PRoW and Bridleways have been considered at high level, without detailed modelling. This is because impacts upon these receptors has been assessed as 'minor adverse' at worst. Full details of these high-level assessments are found in chapters 8 and 9 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4**].

16.6.3 This section of the OEM chapter, regarding glint and glare, is supported by **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**) which contains evidence regarding the closest railway asset demonstrating that no significant adverse effects on railway receptors and infrastructure could occur.

Study Area

16.6.4 The Study Areas for each receptor considered within the glint and glare section of this OEM chapter are based on the potential for significant impacts to occur based on past project experience as well as Pager Power's Glint and Glare Guidance (Ref 16-1), which establishes best practice for the assessment of glint and glare.

16.6.5 As part of the Statutory Consultation material, agreement on sensitive receptors and associated Study Areas was sought with relevant consultation bodies through the presentation of the PEIR for comment. Whilst there is no geometric limit for solar reflections, beyond these limits reflections would be of lesser intensity and are more likely to be screened by obstructions or intervening terrain. Any reflections towards receptors outside of the Study Areas would therefore be considered a low impact in the worst-case scenario.

16.6.6 The locations of relevant receptors are shown within **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

Impact Assessment Methodology

16.6.7 The methodology used in **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]** methodology is based on Pager Power's Glint and Glare Guidance (Fourth Edition) (Ref 16-1), which was developed in line with information provided to Pager Power through consultation with stakeholders and through review of the available studies. This methodology has been used for other solar DCOs such as Cottam Solar Project and West Burton Solar Project, both of which have been granted consent. The methodology for a glint and glare assessment is as follows:

- Identification of relevant receptors based on their type and range from the Photovoltaic (PV) panels
- Technical modelling of the sun path throughout the year to calculate the times and duration of predicted glare for the proposed panel configuration (this modelling considers bare earth terrain and makes a worst-case assumption that direct sunlight is present during all daylight hours)
- Evaluation of impact significance based on the criteria for the receptor type in accordance with Pager Power's guidance (the main considerations are duration, field of view and intensity but this varies per receptor type):
  - For aviation receptors the key considerations are field of view and intensity
  - For road receptors, the key consideration is field of view; and
  - For dwelling receptors, the key consideration is duration.
- Identification of areas that require mitigation, if any; and
- Mitigation strategy if required.

16.6.8 There is no formal guidance with regard to the maximum distance at which glint and glare should be assessed. From a technical perspective, there is no maximum distance for potential reflections. However, the significance of a solar reflection decreases with distance. This is because the proportion of an observer's field of vision that is taken up by the reflecting area diminishes as the separation distance increases. In most instances, terrain and shielding by vegetation are also more likely to obstruct an observer's view at greater distances.

Baseline Conditions

16.6.9 The location of the Scheme is rural, surrounded by roads, dwellings, PRoW, and airfields. A description of the Scheme and its wider context is set out in **ES Chapter 3: Order limits and Context [APP/6.1]**.

16.6.10 Terrain topology and screening in the form of existing buildings and vegetation exist within the assessment area and have been considered, where relevant. For some receptors,

screening will reduce the predicted impacts due to views of the panels not being expected in practice.

16.6.11 The following airfields in the surrounding area were identified for assessment. Full details of the aviation receptors are shown in Section 4.1 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**:

- RAF Marham: approximately 5.1km south-west of the Scheme; and
- Great Friars Thornes Farm Airfield: approximately 1.4km south-west of the Scheme.

16.6.12 As agreed by PINS in **ES Appendix 2.2: EIA Scoping Opinion [APP/6.4]**, aviation infrastructure outside of the 5km and 10km Study Areas, namely East Winch Airfield and Great Massingham Airfield, could be assessed at a high level. Full details are shown in Section 8 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

16.6.13 Road receptors have been identified for assessment along the A47 and A1065. 59 receptors have been identified, at intervals of approximately 100m along these roads. Full details of the road receptors are shown in Section 4.3 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

16.6.14 44 dwelling receptors have been identified within the assessment area. Some receptors are used to represent a small number of separate addresses and results are considered representative for the adjacent observer locations. Full details of the dwelling receptors are shown in Section 4.4 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

16.6.15 Several kilometres of footpaths and bridleways are located within the Order limits and the assessment area. As agreed by PINS in **ES Appendix 2.2: Scoping Opinion [APP/6.4]**, PRoWs are considered at a high-level and without detailed modelling. Full details are shown in Section 9 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

16.6.16 Only the Solar PV Site is relevant for glint and glare, as PV panels will be sited within this area and significant glint and glare effects would not occur from other components of the Scheme. The indicative areas for skylark and curlew mitigation, mitigation and enhancement and/or retained agricultural land/buildings, and areas for the Customer Substation, National Grid Substation, Battery Energy Storage System (BESS) and Grid Connection Infrastructure are not relevant for glint and glare and have therefore not been considered.

Potential Impacts

16.6.17 Prior to the implementation of any mitigation, the Scheme has the potential to affect glint and glare during the construction, operational and/or decommissioning phases in the following ways:

- PV panels can reflect sunlight causing glint and glare towards residential dwellings, potentially negatively affecting residential amenity
- PV panels can reflect sunlight causing glint and glare towards roads, potentially disrupting visibility for road users, posing safety risks
- PV panels can reflect sunlight causing glint and glare towards Air Traffic Control (ATC) towers and aircraft on approach to nearby airfields, potentially disrupting visibility for ATC personnel and pilots, posing safety risks; and
- PV panels can reflect sunlight causing glint and glare towards users of PRoW, potentially negatively affecting amenity.

Embedded Mitigation

16.6.18 Advanced planting and hedgerow enhancement will be undertaken from as early as winter 2025 and is to be completed during winter 2026 along the eastern boundary of the Site (see **Appendix 3: Advanced Planting Plan** to the **outline Landscape and Ecological Management Plan (oLEMP) [APP/7.11]**) in order to fill gaps within the existing screening found between the Site and the A1065. Temporary hoarding is to be erected on the A1065 in the areas shown on **ES Figure 5.2: Construction Masterplan [APP/6.3]** and will remain in place until the advanced planting reaches 3m in height in these areas. This is outlined in the **oCEMP [APP/7.6]**. This is outlined in Tables 9 and 10 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

Assessment of Likely Impacts and Effects

16.6.19 This section considers the potential impacts outlined above and assesses the potential for the Scheme to generate effects using the methodology detailed in paragraph 16.6.7.

Construction and Decommissioning Phases

16.6.20 During the construction phase, the PV panels will be installed over the duration of the construction programme until the operational phase commences. As the Scheme is constructed and PV panels are installed, there is the potential for glint and glare impacts on the identified receptors as detailed for the assessment of operational phase impacts. As a worst-case scenario, the potential glint and glare impacts from the Scheme during the construction phase will be of the same level as during the operational phase, when the maximum number of PV panels are present. As concluded below, there are no likely significant effects during the operational phase, when the Scheme has the highest potential for glint and glare impacts. As a result, during the construction phase, when fewer PV panels will be present and there is less potential for glint and glare impacts, there is no potential for likely significant effects.

16.6.21 During the decommissioning phase, the PV panels will be removed over the duration of the decommissioning programme. As the decommissioning phase progresses, there is potential for glint and glare impacts from the PV panels that have not yet been removed; however, as a worst-case scenario, these impacts would be of the same level as identified during the operational phase, when the maximum number of PV panels are present. As

concluded in the operational phase assessment above, there are no likely significant effects during the operational phase, when the Scheme has the highest potential for glint and glare impacts. As a result, during the decommissioning phase there is no potential for likely significant effects.

Operational Phase

Aviation Receptors

16.6.22 Solar reflections with 'potential for temporary after-image' are predicted to be geometrically possible towards the ATC Tower at RAF Marham for the Fixed South Facing PV Array configuration; however, consideration of Zones of Theoretical Visibility (ZTV) modelling indicates that views of the site are unlikely to be possible in practice. Consultation with the Ministry of Defence is ongoing to confirm whether views of the site are possible from the ATC tower. Solar reflections with 'potential for temporary after-image' are also predicted to be geometrically possible towards the approach path for runway 05 at RAF Marham for the Fixed South Facing PV Array configuration. However, reflections would occur before 6:30am GMT between mid-April and late-August and may therefore be outside typical operating hours for the aerodrome. Consultation is ongoing with the Ministry of Defence to understand their position towards the development and whether this level of glare may be considered operationally accommodatable.

16.6.23 Solar reflections with 'potential for temporary after-image' are predicted towards the approach paths for runways 01 and 05 at RAF Marham for the Single Axis Trackers PV panel configuration. A low impact is predicted due to the duration of glare being very low, and due to the fact that this glare would coincide with direct sunlight. However, consultation with RAF Marham is ongoing to understand their position. If glare is considered operationally accommodatable, the times and dates of potential solar reflections with 'potential for temporary after-image' will be provided to the aerodrome so that pilots can be briefed.

16.6.24 Solar reflections with 'potential for temporary after-image' are predicted towards Runway 06 approach path and visual circuits as well as Runway 24 visual circuits at Great Friar Thornes Farm Airfield for both Fixed South Facing and Single Axis Trackers PV panel configurations. Solar reflections with 'potential for temporary after-image' are predicted to occur towards the approach path for runway 06 only before 6:30am GMT between late-May to late-July and may therefore be outside operating hours for the airfield. Solar reflections with 'potential for temporary after-image' are predicted towards the visual circuits for greater durations, but these receptors are considered less sensitive than the approach paths. Impacts are not expected to be significant, and consequently no mitigation is recommended.

16.6.25 No significant impacts are predicted on aviation activity at both East Winch Airfield and Great Massingham Airfield. Detailed modelling has not been undertaken in relation to the above two mentioned airfields, as it is considered that solar reflections towards East Winch Airfield and Great Massingham Airfield would constitute a low impact in the worst case

due to the distance between the airfields and the Scheme, and when considering previous project experience.

Road Receptors

16.6.26 For the Single Axis Trackers PV Panel configuration, modelling has shown that solar reflections are geometrically possible towards all 59 of the assessed receptors. For the Fixed South Facing PV Array configuration, solar reflections are geometrically possible towards all assessed receptors except receptors 1-4 and 39-59, as defined in section 4.3 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**. The impact towards receptors 14-39, which comprise a section of the A1065, is considered to be low in the context of the Fixed South Facing PV Array configuration, and moderate in the context of the Single Axis Trackers PV panel configuration. However, advance planting and hedgerow enhancement along the eastern boundary of the Site in order to fill gaps within the existing screening found between the Site and the A1065 is to be undertaken up until and during winter 2026. It is anticipated that this planting will be established in advance of panels being installed. The impact is therefore considered to be **not significant**.

16.6.27 No impact is predicted towards the remaining road receptors, as it is anticipated that no solar reflections will be experienced in practice due to the presence of existing screening in the form of vegetation.

Dwelling Receptors

16.6.28 Modelling has shown that solar reflections are geometrically possible towards 36 of the 44 assessed dwellings. A low impact, where solar reflections are geometrically possible for more than three months per year but less than 60 minutes on any given day, is anticipated at one dwelling receptor (dwelling receptor 20) in the context of both the Single Axis Trackers PV Panel configuration and the Fixed South Facing PV Array configuration. However, intervening terrain is predicted to partially obstruct views of reflecting panels, and the nearest panel is over 730m from the dwelling. Impacts are therefore expected to be **not significant**.

16.6.29 A low impact, where solar reflections are geometrically possible for more than three months per year and more than 60 minutes on any given day, is anticipated towards one dwelling receptor (dwelling receptor 10) in the context of the Single Axis Trackers PV configuration only. However, existing vegetation is predicted to partially obstruct views of reflecting panels, and this screening is expected to reduce the duration of reflections to less than three months per year and less than 60 minutes on any given day. Impacts are therefore expected to be **not significant**.

Viewpoint Receptors

16.6.30 No significant impacts towards users of PRoW in the vicinity of the Scheme are anticipated. Detailed modelling has not been undertaken, as it is considered that solar reflections towards PRoW would constitute a low impact in the worst case as there are no

significant safety implications and any negative impact upon amenity will be fleeting for users travelling on PRoW.

Additional Mitigation

16.6.31 At the time of writing, no significant effects associated with glint and glare are considered likely when considering the embedded mitigation already proposed as part of the Scheme. Consequently, no additional mitigation is required.

Residual Effects and Conclusions

16.6.32 Temporary hoarding is to be erected on the A1065 in the areas shown on **ES Figure 5.2: Construction Masterplan [APP/6.3]**, until the advanced planting (detailed in the **oLEMP [APP/7.11]** reaches 3m in height in these areas. This is outlined in the **oCEMP [APP/7/6]**. Consequently, no significant impacts are likely as a result of glint and glare effects.

16.6.33 Consultation with the Ministry of Defence is ongoing to confirm whether views of the Site are possible from the ATC tower at RAF Marham, and to ascertain whether the identified glare with 'potential for temporary after-image' is operationally accommodatable.

Cumulative Assessment

16.6.34 For individual receptors, this cumulative effect assessment identifies where the predicted effects of the Scheme could interact with effects arising from other plans and/or projects occurring within proximity of the Site. A full methodology and cumulative assessment are included within Section 7 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**.

16.6.35 In order for a cumulative effect to be possible with relation to glint and glare, another solar farm must be located within 2km of the Solar PV Site (this allows the respective 1km assessment areas to overlap) and a receptor must have visibility of both solar farms. Two solar projects have been identified within this distance of the Scheme.

16.6.36 High Grove Solar is sited adjacent to The Droves Solar Farm. This project has been considered for cumulative effects with regard to aviation receptors and ground-based receptors (roads and dwellings).

16.6.37 For aviation receptors, cumulative effects are possible; however, modelling suggests that the glare intensity categorisation would not increase towards any of the aviation receptors when considering the schemes cumulatively (see Section 7.2.2 of **ES Appendix 16.2: Solar Photovoltaic Glint and Glare Study [APP/6.4]**). No significant impact is therefore predicted, though this will continue to be considered as further details emerge regarding High Grove Solar.

16.6.38 For ground-based receptors, cumulative effects are possible towards road receptors 14-59 and dwelling receptors 20-44. However, road receptors are not expected to experience cumulative impacts, as the level of impact is predicated on the location of glare rather than duration or intensity; as such, the impacts from the developments can be considered

separately. Only one dwelling (dwelling receptor 20) is within the cumulative assessment zone and is predicted to experience an impact (categorised as low) from the Scheme. This dwelling is likely to have visibility of both sites, but cumulative impacts are unlikely as reflections will not occur at the same time and will not be visible from the same windows.

16.6.39 Burntstalks Solar Farm is a constructed solar project, operated by Lightsource bp, sited approximately 550m south-west of The Droves Solar Farm. This project has been considered for cumulative effects with regard to aviation receptors and ground-based receptors.

16.6.40 For aviation receptors, cumulative effects are not possible as the project is not sited directly adjacent to the Scheme and the primary consideration for aviation receptors is glare intensity. If solar panel areas are spaced apart, they would appear as two separate glare sources rather than a single glare source with increased intensity. No significant impact is therefore predicted.

16.6.41 For ground-based receptors, cumulative effects are not possible as none of the assessed receptors are located within 1km of both sites. No significant impact is therefore predicted.

16.6.42 The above cumulative effects may also occur during the construction and decommissioning phases, but no significant impacts are predicted during these periods as it is considered that the operational phase presents the worst-case for cumulative impacts, as this is when all PV panels will be installed and operational.

16.6.43 No instances have been identified where in-combination cumulative effects are considered likely to result in a new or different likely significant impact, or an impact of greater significance, than any one of the impacts on their own. No significant impacts are therefore identified.

16.6.44 For the Longmarsh Green Energy project, the solar panel areas are located approximately 6.2km from the Solar PV Site for the Scheme. As such, the assessment areas for ground-based receptors will not overlap, and there will be no shared dwelling or road receptors.

16.6.45 The assessment areas for aviation receptors will overlap, and effects upon RAF Marham are possible from both developments; however cumulative aviation effects are only possible where panel areas are located adjacent, as the primary consideration is glare intensity. If solar panel areas are spaced apart, they would appear as two separate glare sources, rather than a single glare source with increased intensity. No significant cumulative effect is therefore predicted.

16.7 Electromagnetic Fields (EMF)

Introduction

16.7.1 As set out in **ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4**) and agreed upon in (**Appendix 2.2: Scoping Opinion [APP/6.4]**), an assessment of Electromagnetic Fields (EMF) is scoped out of the ES on the basis that potentially significant effects can be avoided through design measures and a High-Level Electromagnetic Field Assessment (See **ES Appendix 16.3: High-Level Electromagnetic Field Assessment [APP/6.4]**), setting out the routing and voltages of low and high voltage cables (up to 400kV), is undertaken.

16.7.2 EMFs arise from the generation, transmission, distribution and use of electricity. EMFs occur around all electronic infrastructure.

16.7.3 Design measures for the avoidance of significant effects have been built into the Scheme and, as concluded in the EMF Assessment (see **ES Appendix 16.3: High-Level Electromagnetic Field Assessment [APP/6.4]**), significant effects are not likely in respect of EMF.

16.7.4 The EMF Assessment undertaken as part of the ES includes information regarding the routing and voltages of low and high voltage cables and infrastructure over 132kV.

16.7.5 The EMF Risk Assessment has considered EMF in relation to the following Scheme infrastructure:

- Low and High Voltage underground and overground cables (specifically those that exceed 132kV and are up to 400kV)
- Customer Substation
- National Grid Substation; and
- BESS.

16.7.6 As concluded in **ES Appendix 16.3: High-Level Electromagnetic Field Assessment [APP/6.4]**, there is no potential for significant effects as a result of the Scheme in respect of EMF.

16.7.7 Furthermore, as no potential for significant effects have been identified as part of **ES Appendix 16.3: High-Level Electromagnetic Field Assessment [APP/6.4]** it is concluded there is no potential for significant cumulative effects in relation to EMF as a result of the Scheme and other identified developments within the Study Area.

16.8 Telecommunications, Utilities and Television Receptors

Introduction

16.8.1 Due to the size, scale and nature of the Scheme, as detailed in **ES Chapter 5: Scheme Description [APP/6.1]** and as set out in **ES Appendix 2.1: EIA Scoping Opinion Request [APP/6.4]**, it is considered there is limited potential for likely significant effects on above ground telecommunications, utilities and television receptors during all phases of the Scheme and therefore these have not been considered further. This approach has been agreed with PINS, as confirmed in the **ES Appendix 2.2: Scoping Opinion [APP/6.4]**.

16.8.2 However, solar farms have the potential to affect existing below ground utility infrastructure, for example, through 'cable strike' when piling for Ground Mounted PV Modules or excavating the cable trenches.

Potential Impacts

16.8.3 There are a number of statutory utility services within the Order limits which are shown on **ES Figure 16.1: Statutory Utilities Plan within the Order limits [APP/6.3]**, these include the following:

- Anglian Water Foul Main Sewer
- National Grid Overhead line; and
- UK Power Networks/Eastern Power Networks.

16.8.4 The impacts to underground utilities during the construction phase are associated with activities that involve breaking the ground and potentially striking the below ground utilities.

16.8.5 Due to the nature of the Scheme, there are no below ground impacts associated with the operational phase. Therefore, no likely significant effects on underground utilities are predicted as a result of the operational phase of the Scheme.

16.8.6 There is likely to be no significant effect to below ground utilities due to the cables being severed of operational activities during the decommissioning phase. The cables will either be left in-situ, as this avoids disturbance to overlying land and is the most environmentally acceptable option, or alternatively the cables can be removed opening up the ground at regular intervals and pulling the cable through to the extraction point. Either scenario for decommissioning the below ground infrastructure would not involve any increased risk of cable strike and therefore risk of impact of existing below ground utilities.

Embedded Mitigation

16.8.7 The following embedded mitigation measures have been incorporated into the Scheme design to identify and manage utilities interactions. These include the following

precautionary measures which are written into the **outline Construction Environmental Management Plan (oCEMP) [APP/7.6]**:

- Locating the Scheme outside of utilities' protected zones as part of detailed design of the Scheme, where practicable. This includes partaking in discussions with relevant utility providers as part of the detailed design evolution of the Scheme to ensure legal, safety, and practical design considerations to ensure these have been actively integrated into the Scheme. In addition, protective provisions for the benefit of statutory undertakers and electronic communications network code operators have been included in the **draft Development Consent Order (DCO) [APP/3.1]**
- Above and below-ground infrastructure as part of the Scheme located with adequate offsets/buffers from existing telecommunications and utility infrastructure, where practicable
- Use of geophysical data alongside mapping provided by telecommunication and utilities providers to ensure overground utilities are adequately offset
- The use of ground penetrating radar before excavation to identify any unknown utilities
- Infrastructure that crosses the Scheme is mapped and will be avoided through the detailed design
- Engagement with relevant landowners within the Order limits to identify utilities; and
- Consultation and agreement of construction/demobilisation methods will be undertaken prior to works commencing (this would be covered by the protective provisions included in the DCO).

16.8.8 During all phases of the Scheme there will be safe working beneath any statutory overhead lines and above statutory underground utilities, including, for example, ensuring adequate clearances are in place when plant and equipment are being moved beneath overhead lines, and limiting any planting beneath overhead lines to low growing species. In advance of construction, the Applicant will liaise will all utility providers with assets in the area in regard to construction timelines, construction activities, proximity to assets and construction management measures that will be in place to manage any impacts to utilities.

16.8.9 Furthermore, where the proposed cabling crosses existing below ground utilities, the cables will be laid so that the utilities are crossed at 90° where possible and will be suitably offset where running parallel. This will reduce operational impacts to the existing utility cables.

Potential Effects

16.8.10 Underground utility services have been identified across the Site through a desk-based mapping exercise drawing on information provided by relevant utility providers. Locations of some utilities have furthermore been confirmed on Site through geophysical surveys. No field work/site surveys have been undertaken at the time of submission of the DCO Application in relation to underground utilities. Therefore, there is potential for

underground utilities not identified at this stage to the Applicant to be present within the Order limits. Following implementation of the outline above mitigation measures it is considered this risk could be lessened.

16.8.11 The design of the Scheme has been informed by topographical and geophysical survey data, alongside mapping provided by the landowner of the Solar PV Site, to ensure underground utilities are adequately offset and/or mitigated from. This ensures safe working procedures can be maintained, access can be provided for utility maintenance, and crucially, construction impacts can be mitigated against. The measures set out in the detailed CEMP, to be secured as a requirement of the **draft DCO [APP/3.1]**, will aim to ensure impacts on utilities can be minimised. In addition, protective provisions for the benefit of statutory undertakers are included in the **draft DCO [APP/3.1]**.

16.8.12 Above-ground infrastructure on the Site as part of the Scheme has been positioned to maintain required offsets from existing telecommunications and utility infrastructure, ensuring clear access and minimising potential conflicts such as damage from piling, excavation, or compaction.

16.8.13 In summary, those embedded mitigation measures stated above have been incorporated into the **oCEMP [APP/7.6]** and therefore will be present in the resultant detailed CEMP to ensure construction work minimises impacts on utilities. Where direct interaction is anticipated, utility crossings will be carried out in collaboration with the relevant utility's provider.

16.8.14 The Scheme design is of a generally low height across the development area, with the tallest elements (up to a maximum 55m above ground level (AGL)) of the new electricity pylons and overhead lines forming part of the Grid Connection Infrastructure. As a result, the Scheme is not anticipated to impact on the reception of radio and television in residences, business, and other users.

16.8.15 The mode of removing the cabling would be dependent upon government policy and good practice at that time. Currently, the most environmentally acceptable option is leaving the cables in situ, as this avoids disturbance to overlying land and habitats and to neighbouring communities. Alternatively, the cables can be removed by opening up the ground at regular intervals and pulling the cable through to the extraction point, leaving the ducting and jointing bays in place, avoiding the need to open up the entire length of the cable route.

16.8.16 The embedded mitigation measures (stated above set out within the **oCEMP [APP/7.6]** and **oDS [APP/7.10]**) will reduce the likelihood of effect on utilities during the construction and decommissioning phases of the Scheme. Furthermore, protective provisions will be agreed with statutory undertakers and included in the DCO.

16.8.17 No likely significant effects are expected on telecommunication, utilities or television receptors as a result of the construction, operation or decommissioning of the Scheme, following the application of the embedded mitigation measures.

Additional Mitigation

16.8.18 No significant effects are likely in respect of telecommunications, utilities and television receptors, when considering the embedded mitigation already proposed as part of the Scheme. Therefore, no additional mitigation is required.

Cumulative Effects Assessment

16.8.19 This section presents an assessment of cumulative effects between the Scheme and other existing and/or approved developments.

Cumulative Effects

16.8.20 It is expected that the other solar developments, in particular the nearby High Grove Solar, and others included within the cumulative schemes identified would also have no effect on telecommunications, utilities and television receptors and would adhere to the same embedded mitigation as set out above to reduce the risk of damaging underground utilities. It is anticipated other cumulative schemes will be managed through similar mitigation measures such as a detailed CEMP and would include mitigation measures to reduce the risk of damaging utilities during the construction phase. Therefore, no likely significant cumulative effects are expected on telecommunications, television reception, or utilities.

In-Combination Effects

16.8.21 The receptors identified in the assessment of telecommunications, utilities and television receptors are not shared with any of the other topics in this ES (i.e. they are not 'common receptors'). As a result, there is no potential for in-combination effects with any other technical topic in this ES.

16.8.22 No likely significant in-combination effects relating to telecommunications, utilities and television receptors have been identified.

16.9 Waste

Assessment Assumptions and Limitations

16.9.1 The Waste assessment has considered the following assumptions and limitations:

- The Waste assessment has been undertaken on the basis of information available at the time of writing
- Waste estimates are based upon other similar NSIP schemes; and
- Professional judgement has been used to qualitatively estimate if likely waste streams from unmeasured sources (paint, solvents, etc.) are likely to be significant or not.

16.9.2 The assessment of baseline conditions is limited to publicly available data for 'current' landfill void capacity and publicly available data for forecast void capacity use and future provision.

Assessment Methodology

16.9.3 This section sets out the scope and methodology for the assessment of the impacts of the Scheme on waste.

Sources of Information

16.9.4 The following sources of information that have been consulted in the preparation of this chapter:

- ISEP (formally IEMA) Guide to: Materials and Waste in Environmental Impact Assessment, Guidance for a Proportionate Approach (Ref 16-2)
- Applying the Waste Hierarchy (Ref 16-3)
- Environment Agency (2018 to 2024) Remaining Landfill Capacity (Ref 16-4)
- Environment Agency's Historic Landfill Sites (Ref 16-5)
- Environment Agency's Permitted Waste Sites – Authorised Landfill Site Boundaries (Ref 16-6)
- WRAP's Designing Out Waste: A design team guide for civil engineering (Ref 16-7)
- Waste Local Plans and Monitoring Reports for the East of England (Ref 16-8 to Ref 16-12)
- Environment Agency's Hazardous Waste Interrogator (Ref 16-13) and
- Environment Agency's Waste Interrogator (Ref 16-14)

Potential Impacts

16.9.5 Embedded mitigation measures being incorporated into the design and construction of the Scheme are set out in below. Prior to the implementation of any mitigation (embedded or additional), the Scheme has the potential to have an effect on waste receptors (beneficial

or adverse), during the construction, operational and decommissioning phases in the following ways:

- The generation and disposal of waste and subsequent reduction in landfill void capacity as a result.

Study Area

16.9.6 In line with the ISEP guidance (Ref 16-2) two Study Areas are proposed in relation to Scheme waste:

- The Scheme Study Area – comprising the Order limits
- The wider Study Area for inert and non-hazardous waste – extending to the capacity of waste management infrastructure and remaining landfill void within the region of the East of England. The East of England consists of the following Sub Regions: Bedfordshire, Cambridgeshire, Essex, Hertfordshire, Norfolk and Suffolk. The East of England is used for the non-hazardous waste Study Area (rather than NCC alone) recognising the fact that waste may not always be managed in the Waste Planning Authority where it is generated and may instead be managed at the regional level; and
- The wider Study Area for hazardous waste (including WEEE) – England is used for the hazardous waste study area as treatment of hazardous waste and WEEE operates at a national scale.

Impact Assessment Methodology

16.9.7 The Waste assessment follows the general approach to undertaking EIA, explained in **ES Chapter 2: EIA Process and Methodology [APP/6.2]**, albeit, it has been modified to align with ISEP (2020) guidance (Ref 16-2)**.** The methodology for attributing sensitivity of receptors, magnitude of effects and the significance of effects in relation to waste is described further below in this chapter.

16.9.8 The ISEP guidance offers two methods to assess waste effects: W1 – assessment of void capacity, or W2 – assessment of landfill diversion. In accordance with the ISEP guidance, the assessment focuses on void capacity, which is considered a robust and suitable method for complex developments and is recommended for statutory EIAs. In line with ISEP's recommendation to not to combine both methods, and minimise ambiguity, landfill diversion has been excluded from the assessment. For the purpose of robust assessment and clarity of assessment methodology, the following has been used:

- Void Capacity – The magnitude of impact from waste is assessed by determining the percentage of the remaining landfill void capacity that will be depleted by waste produced during the construction and/or operational phases of the Scheme. In a worst case, where landfill sensitivity is very high, a significant effect would occur at a magnitude of minor.

16.9.9 The impact assessment methodology outlined below has been determined in compliance with the guidance set out by ISEP. The assessment of likely significant effects in relation

to waste has been provided in accordance with ISEP guidance to give an understanding of the waste conditions within the anticipated Study Areas. This assessment therefore aims to make a proportionate assessment of the likely impacts of the Scheme based on the information publicly available at the time of writing.

Sensitivity of Receptor

16.9.10 The sensitivity of likely impacted receptors, defined depending on the vulnerability, recoverability and value/importance of the receptor, to potential effects arising from the Scheme is assessed in line with the below, as detailed in Table 16-3.

16.9.11 The sensitivity of waste receptors is based upon the relative importance of the receptors, and their ability to respond and adapt to the anticipated level of change. These are defined by the assessed baseline conditions.

Table 16-3 Sensitivity Criteria of Identified Receptor

Sensitivity	Definition
Very high	Over the defined study period the future baseline (without development of the Scheme), of regional recycling handling and landfill void capacity is: expected to reduce very considerably (by >10%); end during construction or operation; is already known to be unavailable; or would require new capacity or infrastructure to be put in place to meet forecast demand.
High	Over the defined study period the future baseline (without development of the Scheme) of regional recycling handling and landfill void capacity is expected to reduce considerably: by 6-10% as a result of wastes forecast.
Medium	Over the defined study period the future baseline (without development of the Scheme) of regional recycling handling and landfill void capacity is expected to reduce noticeably: by 1-5% as a result of wastes forecast.
Low	Over the defined study period the future baseline (without development of the Scheme) of regional recycling handling and landfill void capacity is expected to reduce minimally: by <1% as a result of wastes forecast.
Negligible	Over the defined study period the future baseline (without development of the Scheme) of regional recycling handling and landfill void capacity is expected to remain unchanged, or is expected to increase through a committed change in capacity

16.9.12 The sensitivity of waste relates to the availability of landfill capacity in the absence of the Scheme.

16.9.13 The assessment of sensitivity is based on limited publicly available data regarding forecasted changes in landfill capacity during the construction, operational, and decommissioning phases of the Scheme. A precautionary worst-case scenario has been adopted, assuming no increase in current landfill capacity, while recognising that a substantial reduction in available void space remains a risk. However, a complete absence of landfill void space is considered unrealistic, as outlined in the future baseline scenario.

Magnitude of Impact

16.9.14 The categorisation of the magnitude of impact takes into account the following factors:

- Extent
- Duration
- Frequency; and
- Reversibility.

16.9.15 The magnitude of impact is the level of change caused by the Scheme and is defined in Table 16-4.

16.9.16 In determining the anticipated magnitude of impact, the criterion for each level of magnitude has been determined in compliance with the W1 – Void Capacity methodology as set out by ISEP. Where quantitative void capacity impacts cannot be calculated, a qualitative judgement of anticipated impacts will be used.

Table 16-4 Criteria for Determining Magnitude of Impact (Void Capacity)

Magnitude of Impact	Description (Non-Hazardous Waste)	Description (Hazardous Waste)
Major	Waste generated by the development will reduce regional recycling handling and landfill void capacity baseline by >10%.	Waste generated by the development will reduce national landfill void capacity baseline by >1%.
Moderate	Waste generated by the development will reduce regional recycling handling and landfill void capacity baseline by 6-10%.	Waste generated by the development will reduce national landfill void capacity baseline by 0.5-1%.
Minor	Waste generated by the development will reduce regional recycling handling and landfill void capacity baseline by 1-5%.	Waste generated by the development will reduce national landfill void capacity baseline by 0.1-0.5%.

Magnitude of Impact	Description (Non-Hazardous Waste)	Description (Hazardous Waste)
Negligible	Waste generated by the development will reduce regional recycling handling and landfill void capacity baseline by <1%.	Waste generated by the development will reduce national landfill void capacity baseline by <0.1%.
No change	Zero waste generation and disposal from the development.	Zero waste generation and disposal from the development.

Categorising Scale of Effect

16.9.17 The scale of effect that the Scheme may have on an impacted receptor will be influenced by a combination of the sensitivity of the identified receptor and the magnitude of impact.

16.9.18 There are five categories demonstrating the scale of effect:

- Neutral
- Slight
- Moderate
- Large; and
- Very Large.

16.9.19 The terminology used for the scale of effect is as recommended by the ISEP guidance (Ref 16-2), and differs from that presented in **ES Chapter 2: EIA Process and Methodology [APP/6.2]**, although is largely comparable to standard scale of significance of effect (neutral, negligible, low, moderate, and major).

16.9.20 The significance of any environmental effects is determined by the interaction of the magnitude of any impacts and the sensitivity of the receptor and can be beneficial or adverse.

Table 16-5 Scale of Effect

Magnitude of Impact	Sensitivity				
	Very High	High	Medium	Low	Negligible
Major	**Very Large**	**Large or very large**	**Moderate or large**	Slight or moderate	Slight
Moderate	**Large or very large**	**Moderate or large**	**Moderate**	Slight	Neutral or slight
Minor	**Moderate or large**	Slight or moderate	Slight	Neutral or slight	Neutral or slight
Negligible	Slight	Slight	Neutral or slight	Neutral or slight	Neutral
No change	Neutral	Neutral	Neutral	Neutral	Neutral

Determining the Significance of Effect

16.9.21 Where the level of effects have been determined in accordance with professional judgment to be of a moderate, large or very large level of effect, these are deemed to be significant effects. In accordance with the ISEP guidance (Ref 16-2), all effects with regard to the consumption of materials and production of waste are deemed to be adverse effects.

Baseline Conditions

The Order limits

16.9.22 The Scheme is located within the administrative areas of Norfolk County Council and Breckland Council, who are the host authorities. A full description of the Order limits is provided in **ES Chapter 5: The Scheme [APP/6.1]**. For the purposes of the Waste assessment, NCC is the only host waste authority.

Existing Baseline

16.9.23 The land within the Order limits is predominately in agricultural use, being utilised in part for pig farming, chickens and other livestock, and in part for arable crop production across agricultural fields. The existing waste arisings are assumed to be low.

16.9.24 The existing baseline conditions for the wider Study Area has been derived from completed desk studies.

Desk Study

Inert and Non-hazardous Landfill Capacity

16.9.25 Merchant landfills are operated for commercial purposes, accepting waste from construction projects and operating businesses. Merchant landfills are therefore considered to form the baseline. In contrast, restricted landfills are sites that deal with their own produced waste (i.e. not operating for commercial purposes). Therefore, additional capacity is excluded from the baseline. Some non-hazardous landfills have a Stable Non-Reactive Hazardous Waste (SNRHW) cell (e.g. for asbestos). SNRHW cells usually form only a small fraction of the overall capacity. Therefore, for assessment purposes non-hazardous landfills with SNRHW cells are considered in the same way as non-hazardous landfills.

16.9.26 The East of England region has a total inert and non-hazardous landfill capacity of 58.7 million m^3 as of 2023 (Ref 16-4) Compared to 2018, this is a 14.7% increase, generated by substantial new landfill void space being created by mineral extraction sites. That notwithstanding, waste management and monitoring for the East of England (Ref 16-15, Ref 16-8 and Ref 16-) identify some areas in which forecast waste arisings may exceed handling capacity, some void capacity reduction, but also further future landfill void capacity creation. These forecasts however only extend to the 2030s and 2040s at the latest. Due to a lack of consistency in reporting of waste handling and landfill void capacity forecasting, professional judgement is exercised in the consideration of total inert and non-hazardous landfill capacity over the Scheme's construction and operational lifetime. During construction, the sensitivity is anticipated to be 'low', while a conservative professional judgement that the sensitivity is 'medium' during the Scheme's operational lifetime and 'high' at the point of decommissioning.

Hazardous Landfill Capacity

16.9.27 For hazardous merchant landfill, the void capacity in England is 9.68 million m^3. The East of England does not have any hazardous waste landfill facilities with capacity information published under Environmental Agency conditional licencing, and therefore void capacity must be considered at a national level. Publicly available information demonstrated that from 2018-2023, hazardous landfill void capacity has reduced by 49.4%, largely during 2020-2022 (Ref 16-4). The assessment therefore considers hazardous landfill void capacity as being of a 'very high' sensitivity. Therefore, likely significant effects may occur if the quantum of hazardous waste generated by the Scheme that is destined for landfill is more than 9,680 m^3 (0.1% of national landfill capacity).

16.9.28 Hazardous Waste Data for 2023 (Ref 16-13) identifies that approximately 6.04 million tonnes of hazardous waste are handled annually nationally, of which 703,000 tonnes (11.6%) – estimated to be equivalent to between 580,000 and 710,000 m^3 – were sent to landfill.

Waste Management

16.9.29 An assessment of the existing waste management capacity in Norfolk concluded that sufficient capacity already exists to accommodate the forecast growth in waste arisings over the Plan period to 2038. Therefore, it is not considered necessary to allocate any specific sites for waste management facilities in the NM&WLP (Ref 16-15). According to the NM&WLP, as of 2021, there were 88 operational waste treatment and transfer sites in NCC's area. These sites handle a range of waste types, including municipal, commercial and industrial, hazardous, clinical, and construction and demolition waste. In 2021, they received over 2.248 million tonnes of waste, and in 2022, over 2.188 million tonnes.

16.9.30 Norfolk has two non-hazardous landfill sites: Blackborough End and Feltwell. Only Blackborough End accepted waste in both 2021 and 2022, receiving over 131,000 tonnes and 156,000 tonnes respectively. By the end of 2022, it had 2.325 million m^3 of permitted space, but 2.225 million m^3 of this is reserved for inert waste, leaving just 0.1 million m^3 for other non-hazardous waste. Feltwell had 1.204 million m^3 of remaining space. Together, this gives Norfolk a total of 1.304 million m^3 of void space available for non-hazardous waste disposal.

16.9.31 The most recent Waste Management Capacity and Forecast Arisings (2024) (Ref 16-8) identifies that, in Norfolk, the maximum existing waste management capacity of operational sites 3.755 million tonnes per annum, of which 1.1 million tonnes per annum is dedicated to handling of inert and construction and demolition waste arisings.

16.9.32 Information regarding capacity data for waste management is publicly available through permits for example. However, the permitted capacity does not necessarily reflect the actual operational capacity of the infrastructure or indicate how much waste these sites process. A summary of waste inputs by facility within the East of England regions is provided in Table 16-6 below (Ref 16-6). Inputs are not totalled since the double counting of waste moving between the site types listed in the Waste Data Interrogator cannot be discounted.

Table 16-6 Summary of Waste Inputs by Facility for the East of England Region 2023

Facility Type	East of England (Tonnes Received)
Associated Process	2,725
Combustion	164,181
Incineration	1,561,925
Landfill	7,775,684
Mining	105,390

Facility Type	East of England (Tonnes Received)
MRS	3,853,363
On/In Land	1,731,774
Processing	472,222
Storage	314,351
Transfer	5,075,056
Treatment	11,741,551

Waste Targets

16.9.33 The national target for recovery of construction and demolition waste is 70% by weight, as set out in the Waste Framework Directive (Ref 16-) and the Waste Management Plan for England Recovery is deemed to include reuse, recycling, and other recovery methods such as energy recovery. A recovery rate of 70% is assumed be achievable for the purpose of the waste assessment.

16.9.34 Standard, good, and best practice recovery rates by material are provided by the Waste and Resources Action Programme (WRAP) (Ref 16-7). WRAP offers guidelines and benchmarks to help businesses and local authorities improve their recycling and waste management practices. These rates are designed to optimise the recovery of materials and reduce waste sent to landfill. Recovery rates for key construction materials and other construction wastes relevant to the Scheme are provided in Table 16-7 below.

Table 16-7 Recovery rates for key construction materials

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Metals	95	100	100
Packaging	60	85	95
Concrete	75	95	100
Inert	75	95	100
Plastics	60	80	95

Material	Standard Practice Recovery (%)	Good Practice Recovery (%)	Best Practice Recovery (%)
Miscellaneous	12	50	75
Electrical Equipment	Limited Information Available	70	95
Cement	Limited Information Available	75	95
Liquids and Oils	100	100	100
Hazardous	50	100	100

16.9.35 In 2022, the UK generated 63 million tonnes of non-hazardous construction and demolition waste, of which 59.4 million tonnes was recovered. This represents a recovery rate of 94.3%. The UK recovery rate from non-hazardous construction and demolition waste has remained at similar levels from 2010 to 2020 In 2023, 64.8% of UK packaging waste was recycled, up from 62.4% in 2022 (Ref 16-14).

Historic and Authorised Landfills

16.9.36 There are no historic or authorised landfills identified within the Order limits, as outlined in the Environment Agency's Permitted Waste Sites, Authorised Landfill Site Boundaries (Ref 16-6) or Historic Landfill Sites (Ref 16-5) datasets.

Future Baseline

16.9.37 This section considers changes to the baseline conditions as far as changes can be established, described above, that might occur in the absence of the Scheme coming forward during the time period over which the Scheme would be in place. The future baseline scenarios are set out in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**.

16.9.38 There is no publicly available information about changes to landfill capacity by the time the Scheme is built. Landfill capacity is assumed to stay the same because predicting future capacity is unrealistic due to its cyclical nature. Forecasting suggests no space would be left, but this is not credible. If landfill is required in the future, it is assumed that new capacity will be approved. It is the waste authorities duty to manage and ensure that there is sufficient landfill capacity as required. Therefore, non-hazardous and hazardous landfill capacity is assumed to stay the same.

Embedded Mitigation

16.9.39 Likely environmental effects have been or will be avoided, minimised, mitigated or reduced through design measures and/or management of the Scheme, as outlined in this section. Proposed environmental enhancements are also described where relevant.

16.9.40 The following embedded mitigation measures have been incorporated into the Scheme's design.

16.9.41 In accordance with the waste hierarchy (Ref 16-3) the Scheme will prioritise waste prevention, followed by preparation for reuse, recycling, and recovery, with landfill disposal as the last resort.

16.9.42 The nature of the waste to be produced during construction, operational and decommissioning phases will mean it will be managed by appropriately permitted carriers and facilities in line with the appropriate environmental permits and requirements.

16.9.43 All waste management will comply with relevant industry regulations and legislation. All waste transported off-site will be delivered to appropriately licensed receivers. Operators receiving waste materials from the Scheme will follow their own consenting procedures.

16.9.44 Through iterative design and detailed assessment, potential impacts have been evaluated, and mitigation opportunities further refined to prevent or reduce impacts as much as possible. This proactive approach aims to minimise potential adverse impacts from the inception of the Scheme.

16.9.45 The way that potential environmental impacts have been or will be prevented, avoided or mitigated to reduce impacts to a minimum through design and/or management of the Scheme is outlined in this section and has been taken into account as part of the assessment of the potential effects. Proposed environmental enhancements are also described where relevant.

Embedded Construction Phase Mitigation

16.9.46 The following embedded mitigation measures have been incorporated into the Scheme's design for the construction phase:

16.9.47 The Scheme design incorporates embedded mitigation through the predominant use of pre-fabrication. This approach reduces on-site construction waste, with waste produced during unit manufacturing being managed by the companies producing the PV panels, Mounting Structures, BESS, temporary construction site office units, cabling, and (where practicable) substation infrastructure. Consequently, most of the on-site construction waste is packaging. Although some waste is generated during the pre-fabrication process, it is significantly less compared to on-site fabrication, as accepted by the ISEP Guidance (Ref 16-2).

16.9.48 In accordance with the waste hierarchy and the objective of minimising waste generation, uncontaminated excavated soil and stone is, where feasible, to be reused on-site. This

approach aligns with UK government guidance (Ref 16-) which recognises that such materials, when reused on-site, are not considered waste and should not be factored into landfill or recovery calculations. The Scheme commits to excavated ground material being stored on site or reused if suitable for bedding of cables, ground compaction, and cut/fill operations during site grading. Soils from the Scheme will be removed for treatment or disposal if they are found to be contaminated and cannot be treated on site. Any toxic and hazardous materials will also need to be handled by an authorised carrier and a suitably qualified contractor, ensuring no cross-contamination with 'clean' materials. These control measures are set out in the **oCEMP [APP/7.6]** while site storage measures are set out in the **oSMP [APP/7.13]**.

16.9.49 The Scheme will minimise and eliminate waste streams wherever possible, pursuing opportunities for reusing material resources. When reuse and prevention are not feasible, waste will be managed according to the waste hierarchy and detailed in the **oCEMP [APP/7.6]**. The **oCEMP [APP/7.6]** includes industry-standard practices and control measures to address environmental impacts during construction, such as on-site material and waste management. These measures identified in the **oCEMP [APP/7.6]** include the separation of main waste streams on-site before transport to approved, licensed third-party waste facilities for recycling or disposal.

16.9.50 A Site Waste Management Plan (SWMP) is to be prepared before construction begins. The SWMP will detail the efficient management, storage, and legal disposal of materials during the construction phase in line with the measures set out in the **oCEMP [APP/7.6]**. It will also outline the aims, objectives, and ongoing management responsibilities, including practices for management and storage, and set targets for waste reduction, landfill diversion, and reuse. Once appointed, details of the waste carriers and contractors for the Scheme, along with copies of their appropriate licenses, will be included in the SWMP.

16.9.51 A Construction Resource Management Plan (CRMP) will be prepared by the appointed contractor, outlining the strategic approach to planning, coordinating, and managing the labour, materials and equipment, as set out in the **oCEMP [APP/7.6]**.

16.9.52 The location and consolidation of the Temporary Construction Compounds and welfare facilities on the Solar PV Site will help minimise the amount of excavation and construction waste required for hardstanding for access, material storage, and welfare unit placement. Consolidating welfare units within the Temporary Construction Compounds helps reduce construction waste, wastewater, and electricity use. The provision of pre-fabricated welfare units and construction site offices further reduces construction waste generated by the Scheme. Similarly, the BESS consists of modular units that can be grouped into standard shipping container-sized payloads and transported in their finished state to the Site, eliminating the need for construction and packing waste for these elements.

Embedded Operational Phase Mitigation

16.9.53 The following embedded mitigation measures have been incorporated into the Scheme's design for the operational phase:

16.9.54 During the operational phase, the Scheme will adhere to the waste hierarchy by prioritising waste prevention, followed by the reuse, recycling, and recovery of equipment during the replacement of components. Landfill disposal will be considered only as a last resort. A Waste Management Strategy will be developed and agreed with the authority prior to commencement of the operation (including maintenance) as part of the detailed Operational Environmental Management Plan (OEMP), to be prepared in accordance with the **oOEMP [APP/7.8]** submitted in support of the DCO Application.

16.9.55 All waste management will comply with relevant regulations, and waste will be transported by licensed hauliers to authorised waste management sites with the necessary permits for the consigned wastes.

16.9.56 The Scheme is expected to generate WEEE during the operational phase. This includes PV panels and smaller quantities from Associated Development. These items will be recovered and recycled by an authorised reprocessor in compliance with the WEEE Regulations 2013 (Ref 16-).To ensure this is done according to *"Best Available Treatment Recovery and Recycling Techniques",* a list of up-to-date authorised reprocessors should be established prior to the operational phase of the Scheme and kept up-to-date throughout the operational phase. This will be secured through measures set out within the **oOEMP [APP/7.8]**.

16.9.57 Batteries must be separated from WEEE streams so they can be recovered, recycled, or disposed of in accordance with the Waste Batteries and Accumulators Regulations 2009 (Ref 16-). This is most likely to be undertaken by the battery manufacturer or supplier. This requirement will be secured ahead of the Scheme's operational phase, based on the detail provided in the **oOEMP [APP/7.8]** to ensure it is undertaken as legally required throughout the operational phase of the Scheme.

Embedded Decommissioning Phase Mitigation

16.9.58 The following embedded mitigation measures have been incorporated into the Scheme design for the decommissioning phase:

16.9.59 During decommissioning, the Solar PV Arrays, 33 kV Sub-distribution Switch Rooms, Ancillary Buildings, Ancillary Infrastructure, Conversion Units, Customer Substation, and BESS will be removed, recycled, recovered, or disposed of in accordance with good practice and market conditions at that time. As outlined above, the Scheme is anticipated to generate WEEE; however, the recycling and recovery of these items is detailed in the **oDS [APP/7.10]**.

16.9.60 The decommissioning of the Scheme will adhere to the measures and procedures outlined in the **oDS [APP/7.10]**, upon which the detailed DS will be prepared, as secured through requirement of the **draft DCO [APP/3.1]**. A Decommissioning Resource Management Plan (DRMP) will be developed by the appointed contractor and will set out how to manage the disposal of waste in accordance with relevant legislative and policy requirements at the time of decommissioning, this secured in the detailed DS.

16.9.61 The **oOEMP [APP/7.8]** and **oDS [APP/7.10]** state that the Applicant is committed to maximising the recycling and reuse of Scheme components at the end of their operational life. There are already organisations around the UK and Europe specialising in solar recycling, such as PV Cycle and the European Recycling Platform. These organisations work with solar developers to minimise electrical waste and recycle old panels in line with the WEEE Regulations. Additionally, companies like SECONDSOL offer a marketplace service for buying and selling second-hand PV panels and equipment, where there is still a good level of life remaining. PV panels that have developed faults or damage can also be refurbished and repowered by specialist companies and manufacturers, then resold or reinstalled. The Applicant will adhere to the industry good practice outlined in Solar Power Europe's Lifecycle Quality Best Practice Guidance (Ref 16-).

Assessment of Likely Effects

16.9.62 This section of the assessment of likely waste effect identifies and characterises potential impacts arising during the construction, operational and decommissioning phases of the Scheme.

16.9.63 Taking into account the embedded mitigation measures as detailed in above, the potential for the likely effects of the Scheme on waste receptors was assessed using the methodology as detailed in paragraphs of this chapter. In the sections below, effects during the construction, operational and decommissioning phases of the Scheme are assessed for waste receptors scoped into this assessment.

16.9.64 Any additional mitigation, if required to reduce these effects, is then set out thereafter. Finally, an assessment is made of the significance of any residual effects after all mitigation measures have been accounted for.

Construction Phase

16.9.65 During the construction phase, it is likely that waste will arise from the following streams:

- General waste from site offices and welfare facilities
- Packaging waste from incoming materials; and
- Other waste from construction of fencing, Access Tracks and other Ancillary Infrastructure.

16.9.66 Construction activities associated with the Scheme are extensive and are anticipated to be undertaken over a 24-month construction period plus site preparation period of up to 6 months prior to construction. Construction waste generated across the Site has been assessed in this section. These activities include, but are not limited to, the below. The volumes also referenced are precautionary and a worst-case scenario, which is considered to reflect the maximum parameters ('envelope') of the Scheme design. The main construction activities associated with the Scheme are as follows:

- Creation of a new National Grid Substation

- Construction of up to 10no. transmission towers (pylons)
- Decommissioning of up to 7no. existing transmission towers (pylons) and up to ~30.6 km of conductors and cabling (overhead wires)
- Piling of Mounting Structures across the Solar PV Site
- Mounting of the PV panels onto the Mounting Structures
- Digging of trenches for laying of underground Cabling
- Creation of concrete foundations or monolith plinths as required for the Customer Substation, National Grid Substation, Conversion Units, 33 kV Sub-distribution Switch Rooms, Storage units and BESS, as required
- Creation of Access Tracks within the Site
- Installation of deer fence wire mesh and wooden post fencing and metal palisade security fencing; and
- Installation of CCTV camera poles.

16.9.67 The DCO Application includes the creation of a new 400 kV National Grid Substation, together with the rerouting of a 1.4 km section of the existing Overhead Line. If required, this would include the decommissioning of up to 7no. existing pylons, and up to approximately 30.6 km of electrical conductors and earth wiring as part of these works. For the purposes of this assessment, the potential decommissioning of the existing National Grid infrastructure has been treated as the worst-case scenario and has been included within the assessment.

16.9.68 The PV panels, Mounting Structures, Conversion Units and other Associated Development will be manufactured offsite to the specified sizes, and wastage during installation is expected to be minimal. The majority of the construction equipment will be delivered to the Site for assembly, installation and connection. The types of waste streams associated with the removal of waste material during construction are summarised below in Table 16-8.

16.9.69 Sewage waste generated during the entire construction phase has been estimated to be approximately 14,200m^3. Any wastewater generated from welfare facilities will be removed by tanker to an approved wastewater and sewage treatment centre. As such, this would not give rise to significant environmental effects and is not considered further.

16.9.70 Employee activity will generate a minimal amount of commercial, food and sewage waste. Commercial and food waste will be managed by appropriate permitted waste carriers and taken to facilities in line with environmental permits and requirements.

16.9.71 Large-scale earthworks are not anticipated, with a cut and fill strategy developed that ensures all excavated material is to be re-used on Site; it is not expected that large quantities of material will need to be removed from the Site. It is expected that all materials removed during cable trenching activities or the creation of working or laydown/compound areas will be reinstated, with no need for material import or export. While the potential for

generating some surplus excavated material cannot be entirely ruled out, the quantities involved would be insignificant in the context of regional landfill capacity.

16.9.72 Table 16-8 summarises the anticipated waste streams from construction.

Table 16-8 Anticipated waste streams from the Construction Phase (rounded to 3 significant figures)

Waste Type	Estimated Waste Quantity (m3)	Recyclable / Recoverable
General waste from site offices and welfare facilities	Minimal	Yes
Waste from the maintenance of construction vehicles	Minimal	Yes
Hazardous waste (e.g. chemicals, batteries, solvents, oils, aerosols etc.)	Minimal	Yes
Vegetation	Minimal	Yes
Decommissioned National Grid Infrastructure	114 245 tonnes	Yes
Transmission towers[1]	93.1	Yes
Electrical Conductors[2]	21.1	Yes
Earth wire[3]	<1.0	Yes
PV Panel Packing Materials	28,600 1,910 tonnes	Yes
Pallet Wood	9,630	Yes
Polyurethane Foam: padding between modules	8,950	Yes

[1] Based on 5no. L6(c) D STD towers, 1no. L6(c) D30 STD tower, and 1 no. L6(c) D60 STD tower
[2] Based on Araucaria type conductor, 700 mm^2 x 18no., 1.4 km length
[3] Based on Keziah type earthwire, 160 mm^2 AACSR, 1.4 km length

Waste Type	Estimated Waste Quantity (m3)	Recyclable / Recoverable
Paper, Cardboard, Kraft board	9,820	Yes
HDPE: Corner pieces and spacers	163	Yes
Pallet Nails	2.95	Yes
PV Panel Structure Packing Materials	7,020 834 tonnes	Yes
Pallet Wood	3,480	Yes
Paper, Cardboard, Kraft board	3,550	Yes
Pallet Nails	1.06	Yes
Cable Drum Materials	912 365 tonnes	Yes
DC Cable Drums (size 6)	191	Yes
Grounding Cable Drums (size 10)	85.5	Yes
LV Cable Drums (size 20)	590	Yes
MV Cable Drums (size 20)	45.0	Yes
Total	36,600 3,350 tonnes	Yes

16.9.73 Excavated material is excluded from the construction waste estimates and from the calculation of the overall waste recovery rate. This is because, where feasible, such material will be reused on-site and therefore not classified as waste. This approach aligns with UK government guidance (Ref 16-) which recognises that such materials, when reused on-site, are not considered waste and should not be factored into landfill or recovery calculations.

16.9.74 There may be a requirement to remove some soils from the Scheme for treatment or disposal if they are found to be contaminated and cannot be treated on site, or are otherwise unsuitable for on-site use. Any toxic and hazardous materials will also need to

be handled by an authorised carrier and a suitably qualified contractor, ensuring no cross-contamination with 'clean' materials. With the use of appropriate control measures (as set out in the **oCEMP [APP/7.6]**), no significant effects are anticipated at this stage.

16.9.75 All waste transported offsite will be taken to appropriately licensed sites for the relevant materials. The operators receiving any waste materials from the Scheme will be subject to their own consenting procedures applicable at the time of the construction phase. Any waste created during the construction phase will need to be removed from the Site and disposed of in accordance with legal requirements.

16.9.76 Any reusable waste materials generated as part of the Scheme, such as soil excavated from trenches, Access Tracks, temporary Construction Compounds, drainage features, and foundations, will be reused wherever possible.

16.9.77 Consideration of potential effects associated with wastewater disposal from welfare facilities are subject to agreement of foul water collection methodology. This is anticipated to be undertaken by the appointed principal construction contractor, in discussion with the EA, as outlined in **ES Chapter 12: Water Resources [APP/6.2]**. Where a connection to existing foul water infrastructure is not proposed, wastewater would be stored on-site to be tankered to a wastewater treatment facility.

16.9.78 Estimated volumes and potential streams of construction waste, in addition to estimated water and electricity usage, have been used within **ES Chapter 13: Climate Change [APP/6.2]** to establish the Greenhouse Gas emissions associated with the construction of the Scheme.

16.9.79 An assessment of construction traffic impacts, including the removal of waste from the Site, is provided in **ES Chapter 9: Transport and Access [APP/6.2]**.

Conclusion

16.9.80 With the embedded mitigation measures in place, the overall quantities of construction waste likely to be generated during the 24-month construction phase is 36,600 m^3, equivalent to approximately 3,350 tonnes of waste. No substantial quantity of this is anticipated to be hazardous.

16.9.81 With respect to construction and demolition (C&D) waste handling in Norfolk, the Scheme is anticipated to generate 1,680 tonnes of C&D per annum during the construction phase. This is equivalent to 0.15% of 2024 C&D waste capacity in Norfolk and is therefore not a substantial increase to waste handling requirements. Taking an absolute worst-case scenario that all C&D waste generated during construction by volume (36,600m^3) is disposed to landfill in the East of England, this is equivalent to 0.06% of inert or non-hazardous landfill void capacity for this region.

16.9.82 The magnitude of impact to inert and non-hazardous waste void capacity is negligible. Due to it being assigned a low sensitivity during the construction phase of the Scheme, the effect is neutral or slight adverse, which is considered **not significant**.

16.9.83 The magnitude of impact to hazardous waste void capacity is considered to be negligible, which due to it being assigned a low sensitivity during the construction phase of the Scheme, the effect is neutral or slight adverse, which is considered **not significant**.

Operational Phase

16.9.84 As set out in **ES Chapter 5: The Scheme [APP/6.1],** during the operational phase, there are not expected to be any permanent onsite staff members. The short-term workforce required to deliver the peak replacement scenario of all PV panels and BESS infrastructure is assessed as requiring approximately 60% as much labour as construction over a minimum 12-month programme.

16.9.85 All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them. Waste generated from maintenance activities, such as component replacement during the Scheme's operation and maintenance, will be managed similarly to waste from the Scheme's final decommissioning.

General Operation and Maintenance Activities

16.9.86 The Site will be unmanned with personnel monitoring the Scheme remotely. Waste arising during the operational phase from routine inspection and maintenance activities is expected to be substantially less than during the construction and decommissioning phases and would include the following:

- Waste metals
- Equipment that requires replacing, such as PV panels and BESS
- Waste associated with maintenance; and
- General waste (paper, cardboard, wood).

16.9.87 Waste generated from daily operations will include waste from welfare facilities and general waste such as paper, cardboard, and wood.

16.9.88 During the operational phase of the Scheme, waste arisings associated with general maintenance activities are expected to be minimal and, as they will 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 assumed that the local waste infrastructure has the capacity for this. As such, it is anticipated at this time, general activities will result in limited amounts of waste.

16.9.89 During the operational phase, the predominant source of waste is related to the removal of expired or broken equipment that cannot be repaired, and packing material required for replacement material. WEEE arising from the operation and maintenance of the Scheme is anticipated to be limited to worn or broken photovoltaic panels, as these are identified as WEEE under Schedule 4 of the WEEE Regulations 2013 (Ref 16-) These are not likely

to be more than negligible quantities of hazardous materials and will be recycled where practical.

16.9.90 It is likely that PV panel waste generated during the Scheme's operational phase will be managed by specialist regional or national recycling facilities. These facilities are expected to develop in response to the demand generated by the UK-wide solar panel industry. The capacity of these facilities is not expected to be influenced by other non-solar farm projects in the surrounding area, as they will only manage solar panel waste.

16.9.91 There are several companies which provide recycling services for solar panels. The companies 'Recycle Solar' and ‘Solar Recycling Solutions’ reports that 90-99% of glass and semiconductor materials in end-of-life solar panels can be recycled or recovered for use in new panels (Ref 16- and Ref 16-).

16.9.92 The UK market for Lithium-ion (Li-ion) battery recycling is developing, driven by the rapid increase in electric vehicles and other Li-ion battery users. Several new investments have been announced, and an 80% recovery rate is reported (Ref 16-26 and Ref 16-27).

16.9.93 It is expected that greater private sector waste companies will develop facilities to meet market demands. This market growth is expected to be driven by the increasing number of PV installations, which are being implemented as part of the Government's initiative to achieve net zero emissions. Currently, PV panel waste generation is low, resulting in limited demand for facilities and available capacity. Therefore, it is expected that facilities for reusing, recycling, or recovering end-of-life PV panels will be developed as the waste stream demand increases. The WEEE Regulations 2013 (Ref 16-) require those who place PV panels on the market to finance the costs of collection, treatment, recovery, and environmentally sound disposal.

16.9.94 Wastewater generated during the operational phase relates to a single welfare facility at each substation site. This is likely to consist of a septic tank arrangement. As no permanent onsite staff are anticipated, a maximum of 125 m3 of sewage waste is anticipated to be generated on site per annum. All waste water will be removed by tanker to an approved wastewater and sewage treatment centre. As such, this would not give rise to significant environmental effects and is not considered further.

16.9.95 Waste arisings during the operational phase is largely anticipated to be limited to replacement of faulty or broken onsite infrastructure. An estimated failure rate of 0.05% of the PV panel per annum has been used based on professional experience. Resultantly, the Scheme is anticipated to annually generate up to 6.79m3 (15.5 tonnes) of WEEE, and 14.3m3 (0.95 tonnes) of pallet wood and packaging waste. During the operational phase, waste generation arising from general maintenance activities (such as lubricants and oils for electrical infrastructure, and individual replacement parts on machinery) is expected to be negligible.

Replacement Activities

16.9.96 Over the 60-year lifespan of the Scheme, it is expected that, in addition to regular equipment maintenance, infrastructure such as PV panels and BESS Units will need to be replaced (see Table 16-9). PV panels are anticipated to be replaced once, while the BESS Units may need replacement up to five times during the Scheme's lifetime, subject to the operator's discretion. Further details of the scheme of replacement activities is set out in **ES Chapter 5: The Scheme [APP/6.1]**.

Table 16-9 Operational Replacement Rates

Waste Type	Indicative Design Life	Recyclable / Recoverable
PV Panels	40 years One replacement event during Scheme lifetime.	Recyclable
Transformers	30 years One replacement event during Scheme lifetime. Only to be carried out if required for performance of health and safety reasons.	Recyclable
BESS	Up to five replacement events during Scheme lifetime.	Recyclable

16.9.97 Equipment that requires replacement during the operational phase will be managed in line with the waste hierarchy and in accordance with legislation in force at the time, with materials re-used or recycled wherever possible (as detailed in the **oOEMP [APP/7.8]**).

16.9.98 During the replacement activities, all components identified in Table 16-9 are expected to be fully recyclable, with greater opportunities for recycling anticipated by year 30. Furthermore, the volume of packaging waste associated with component delivery is anticipated to be significantly lower than the packaging materials associated with the construction phase, as infrastructure such as Mounting Structures will already be in place.

16.9.99 Table 16-10 summarises the anticipated waste streams from the peak replacement phase at Year 30.

Table 16-10 Anticipated waste streams from the peak replacement phase (rounded to 3 significant figures)

Waste Type	Estimated Waste Quantity (m3)	Estimated Waste Quantity (tonne)	Recyclable / Recoverable
General waste from site offices and welfare facilities	Minimal		Yes
Waste from the maintenance of vehicles	Minimal		Yes
Hazardous waste (e.g. chemicals, batteries, solvents, oils, aerosols etc.)	Minimal		Yes
PV panel Packing Materials	**28,600**	**1,910**	**Yes**
Pallet Wood	9,630	-	Yes
Polyurethane Foam: padding between panels	8,950	-	Yes
Paper, Cardboard, Kraft board	9,820	-	Yes
HDPE: Corner pieces and spacers	163	-	Yes
Pallet Nails	2.95	-	Yes
WEEE (PV panel)	**13,600**	**31,000**	**Yes**
PV panel – Silicon	635	1,480	Yes
PV panel – Glass	11,300	25,000	Yes
PV panel – Metals	1,570	4,250	Yes
PV panel – Hazardous (including heavy metals)	34.7	277	Yes

Waste Type	Estimated Waste Quantity (m3)	Estimated Waste Quantity (tonne)	Recyclable / Recoverable
BESS (Batteries and Accumulators)	**34,100**	**31,600**	**Yes**
BESS units	34,100	31,600	Yes

16.9.100 Currently, recycling routes for component replacement waste are generally available and it is anticipated that recycling opportunities will increase in the future, driven by the expanding market for solar PV installations. Waste materials requiring removal from the Site would be transported using licensed carriers and records kept, detailing the types and quantities of waste moved and the destinations, in accordance with the relevant regulations.

16.9.101 Sewage waste generated during the peak replacement scenario has been estimated to be approximately 8,500m3. As during the construction phase, any wastewater generated from welfare facilities will be removed by tanker to an approved wastewater and sewage treatment centre. As such, this would not give rise to significant environmental effects and is not considered further.

Conclusion

16.9.102 With the embedded mitigation measures in place, the overall quantities of annual operational waste likely to be generated is: 14.3m^3 (~0.95 tonnes) of inert and non-hazardous waste; and 6.79m^3 (~15.5 tonnes) of WEEE (PV panels) and BESS, which for the purpose of this assessment is considered as hazardous waste.

16.9.103 For the annual handling of operational waste, including taking the assumption that all is disposed to landfill, the Scheme is anticipated to have a negligible magnitude of impact to regional inert and non-hazardous waste void capacity, and to national hazardous waste void capacity. Due to the respective medium and very high sensitivity of these receptors during the Scheme's operational lifetime, the effect to regional inert and non-hazardous waste void capacity is neutral to slight adverse, and to national hazardous waste void capacity is slight adverse. Both of these effects are considered to be **not significant**.

16.9.104 Considering a 12-month worst case scenario, peak replacement activities are anticipated to generate: 28,600m^3 (~1,910 tonnes) of inert and non-hazardous waste; and 47,700m^3 (~62,600 tonnes) of WEEE and Batteries, which for the purpose of this assessment is considered as hazardous waste.

16.9.105 Applying current baseline conditions to estimate future conditions for C&D waste handling in Norfolk, the peak replacement scenario on the Scheme is anticipated to generate an equivalent to 0.17% of C&D waste capacity in Norfolk and is therefore not a substantial increase to waste handling requirements. Taking an absolute worst-case scenario that all

C&D waste generated during construction by volume (28,600m^3) is disposed to landfill in the East of England, this is equivalent to 0.05% of inert or non-hazardous landfill void capacity for this region. Therefore, the magnitude of impact to inert and non-hazardous waste void capacity is negligible. Due to it being assigned a medium sensitivity, the effect is neutral to slight adverse, which is considered **not significant**.

16.9.106 For the recycling and recovery of WEEE and waste batteries, the Scheme is committed to achieving *"Best Available Treatment Recovery and Recycling Techniques"* which indicatively demonstrate that 95% of WEEE and BESS can be recycled or recovered (see Table 16-7). As such, an estimated worst-case of 2,380m^3 (~3,130 tonnes) of WEEE and waste BESS units generated by the Scheme during the peak replacement scenario is anticipated to go to landfill following treatment. This therefore is equivalent to 0.02% of the national landfill void capacity for hazardous waste (as of 2023). The magnitude of impact to hazardous waste void capacity is therefore considered to be negligible. Due to the receptor's very high sensitivity, the effect is slight adverse, which is considered **not significant**.

Decommissioning Phase

16.9.107 The decommissioning phase of the Scheme will involve the decommissioning of the Solar PV Site as detailed in **ES Chapter 5: The Scheme [APP/6.1]**. The National Grid Substation, and the Grid Connection Infrastructure would remain in situ. The approach to cable removal will be dependant upon government policy and best practice at the time; however, for the purposes of this assessment, cable removal has been assumed as a worst-case scenario.

16.9.108 The **oDS [APP/7.10]** will ensure the Scheme is decommissioned in accordance with best practices and guidance at the time.

16.9.109 The main decommissioning waste streams associated with the Scheme are expected to include:

- PV panels and their associated Mounting Structures and cabling
- Breaking up of concrete foundations/bases
- Rubble and aggregate from Customer Substation and any Access Tracks within the Site
- Electrical equipment, including BESS, Inverters, and Transformers
- Welfare facility waste; and
- Waste metals and wood.

16.9.110 As described in **ES Chapter 5: The Scheme [APP/6.1]**, the Scheme will be decommissioned at the end of its operational phase, which is expected to be 60 years after construction is completed. It is not possible to identify specific waste management routes or facilities at this stage, as these are likely to change over such a timescale.

16.9.111 Prior to the decommissioning phase, opportunities to minimise waste will be explored. Possibilities for reusing, recycling, or recovering materials will be considered before resorting to landfill options. The emerging industry for recycling PV panels will be explored, along with any resale of operational panels.

16.9.112 The Solar PV Arrays, Cabling, Inverters / Conversion Units, Customer Substation, Ancillary Infrastructure, and the BESS will be removed and recycled or disposed of in accordance with good practice and market conditions at that time. The waste management method and key procedures will be set out in a detailed DS. Standard good practices for waste management will be implemented during decommissioning, as outlined within the **oDS [APP/7.10]**. The contractor will be required to minimise waste and reuse decommissioned items as much as possible to reduce landfill waste.

16.9.113 The types of waste streams associated with the removal of waste material during decommissioning are summarised below in Table 16-11. A qualitative estimate on the volume of waste materials is made in Table 16-11 given the information that is known at this stage.

16.9.114 As set out in the **oDS [APP/7.10]**, the Applicant is committed to maximise recycling and reuse of the Scheme components at the end of their operational life.

16.9.115 If any hazardous materials need to be removed during decommissioning, suitably qualified contractors will be appointed to handle and remove these items. Hazardous materials may include lithium-ion batteries and transformer oil.

16.9.116 As with construction activities, all wastewater and sewage from decommissioning will be stored on-site and removed by tanker to an approved wastewater and sewage treatment centre. Based on a commissioning activities requiring up to 80% of the labour as construction, sewage waste generated during decommissioning has been estimated to be approximately 11,400m^3. Any wastewater generated from welfare facilities will be removed by tanker to an approved wastewater and sewage treatment centre. As such, this would not give rise to significant environmental effects and is not considered further.

16.9.117 The Scheme is anticipated to generate substantial WEEE during decommissioning. The Scheme includes *"large-scale fixed installations"* as defined in the WEEE Regulations 2013, such as Transformers within the Customer Substation, which are excluded from the regulations. These will need to be removed and dismantled by authorised competent specialists during decommissioning. The recovery, recycling, or disposal of any part of large-scale fixed installations should be undertaken in accordance with the Waste Hierarchy. Table 16-11 summarises the anticipated waste streams from the decommissioning phase of the Scheme.

Table 16-11 Anticipated waste streams from decommissioning (rounded to 3 significant figures)

Waste Type	Estimated Waste Quantity (m3)	Estimated Waste Quantity (tonne)	Recyclable / Recoverable
General waste from site offices and welfare facilities	Minimal		Yes
Waste from the maintenance of vehicles	Minimal		Yes
Hazardous waste (e.g. chemicals, batteries, solvents, oils, aerosols etc.)	Minimal		Yes
Inert C&D waste	**142,000**	**240,000**	**Yes**
PV Mounting Structures – Metal	6,670	16,700	Yes
Access track and substation aggregate	89,600	134,000	Yes
Concrete foundations (BESS, inverters and transformers)	44,900	86,500	Yes
Cabling	968	2,610	Yes
WEEE (PV panel)	**13,600**	**31,000**	**Yes**
PV panel – Silicon	635	1,480	Yes
PV panel – Glass	11,300	25,000	Yes
PV panel – Metals	1,570	4,250	Yes
PV panel – Hazardous (including heavy metals)	34.7	277	Yes
BESS (Batteries and Accumulators)	**43,100**	**34,300**	**Yes**

Waste Type	Estimated Waste Quantity (m3)	Estimated Waste Quantity (tonne)	Recyclable / Recoverable
BESS units	34,100	31,600	Yes
BESS Inverter units	8,950	2,700	Yes
Large Installations	**14,800**	**5,400**	Yes
Inverters / Conversion Units	11,450	3,350	Yes
Substations	3,360	2,050	Yes

16.9.118 As outlined in above, there are already organisations around the UK and Europe specialising in solar recycling, such as Recycle Solar, PV Cycle and the European Recycling Platform.

16.9.119 Waste materials transported off-site will be delivered to a licensed waste disposal site. Currently, there are no baseline estimates for capacity at county recycling and landfill sites for the estimated earliest decommissioning date of 2093. Therefore, the sensitivity of these receptors cannot be accurately determined. For this assessment, it is assumed that sensitivity levels in 2093 are the same as those in 2025. Technological advancements in recycling, reuse, and waste treatment may also change the outcomes compared to current technology.

Conclusion

16.9.120 Decommissioning activities are anticipated to generate a large quantum of waste as set out in Table 16-11: 142,000m^3 (~240,000 tonnes) of inert and non-hazardous waste; 56,600m^3 (~65,300 tonnes) of WEEE and BESS, which for the purpose of this assessment is considered as hazardous waste; and 14,800m^3 (~5,400 tonnes) of large installations for disposal.

16.9.121 Applying current baseline conditions to estimate future conditions for C&D waste handling in Norfolk, the decommissioning of the Scheme (based on an estimated 24-month decommissioning programme) is anticipated to generate an annual equivalent to 10.9% of C&D waste handling capacity in Norfolk. This is a substantial amount (equivalent to a major magnitude impact on C&D waste handling capacity in Norfolk), albeit is largely consistent of aggregate and concrete rubble, for which waste handling facilities are well resourced and well placed for recovery and recycling aggregate and concrete waste for future uses. As such, this is therefore a substantial increase to waste handling requirements but is unlikely to have any increased onward environmental effect. Taking an absolute worst-case scenario that all C&D waste generated during construction by

volume (142,000m^3) is disposed to landfill in the East of England, this is equivalent to 0.24% of inert or non-hazardous landfill void capacity for this region.

16.9.122 Therefore, the magnitude of impact to inert and non-hazardous waste void capacity is negligible. Due to future inert and non-hazardous landfill void capacity being assigned a high sensitivity (as there is no long term forecasting for up to the 2090s), the effect is a slight adverse effect, which is considered **not significant**.

16.9.123 During the Scheme's operational lifetime, the Scheme is committed to achieving *"Best Available Treatment Recovery and Recycling Techniques*", which indicatively demonstrate that 95% of electrical infrastructure from decommissioning can be recycled or recovered (see Table 16-7). This is considered to apply directly to Solar PV infrastructure and BESS infrastructure from the Scheme, while large-scale installations such as inverters and transformers are likely to require waste management by specialist contractors who are also likely to achieve high recovery and recycling rates. As such, an estimated worst-case of 2,830m^3 (~3,260 tonnes) of WEEE and BESS generated by the Scheme during decommissioning is anticipated to go to landfill following treatment. This therefore is equivalent to 0.03% of the national landfill void capacity for hazardous waste (as of 2023).

16.9.124 Waste generated by large-scale installations is removed and dismantled by authorised competent specialists during decommissioning. It is anticipated that these specialists will also be committed to up to a 95% recycling or recovery rate. As such, it can be estimated that a worst-case of 740m^3 (~270 tonnes) of potentially hazardous materials from large-scale installations are destined to go to landfill following treatment. This therefore is equivalent to 0.01% of the national landfill void capacity for hazardous waste (as of 2023). Together with WEEE and BESS, the magnitude of impact to hazardous waste void capacity is therefore considered to be negligible. Due to the receptor's very high sensitivity, the effect is slight adverse, which is considered **not significant**.

Additional Mitigation Measures

16.9.125 As no significant effects have been identified above for receptors during any phase of the Scheme once embedded mitigation is taken into account, no additional mitigation measures for the Scheme are required when considered in isolation.

Residual Effects

16.9.126 As there are no significant effects identified the effects will remain unchanged as those reported above in the assessment of likely effects.

Cumulative Effects Assessment

16.9.127 This section presents an assessment of cumulative effects between the Scheme and other existing and/or approved developments.

16.9.128 As set out in **ES Chapter 2: EIA Process and Methodology [APP/6.1]**, a Cumulative Effects Assessment (CEA) has been undertaken as part of the EIA in accordance with

PINS Advice on Cumulative Effects Assessment (September 2024) and has considered two types of cumulative effects.

- In combination effects: the combined effects generated by individual effects on a particular receptor (presented within **ES Chapter 17: In-Combination Effects [APP/6.2]**); and
- Cumulative effects: effects generated by the Scheme and other planned or approved developments on the same receptor.

In-Combination Effects

16.9.129 In-combination effects occur when receptors are subject to effects under more than one environmental topic. As such, the effects presented in **ES Chapters 6-16 [APP/6.2]** (regardless of whether they are classed as significant or not significant) have been reviewed to identify receptors subject to one or more types of effect to ensure that the interrelationship between each of the aspects of the environment likely to be affected by the Scheme has been properly evaluated and considered.

16.9.130 The assessment of in-combination effects is presented in **ES Chapter 17: In-Combination Effects [APP/6.2]**.

16.9.131 The assessment of waste effects is interdependent with the assessment of climate change effects, hydrology and flood risk effects, and transport effects. That notwithstanding, the assessment of waste receptors are not subject to assessment in any other topic chapter in the ES. As such, no likely significant in-combination effects relating to waste have been identified.

Cumulative Effects

16.9.132 Cumulative effects may arise as a result of effects associated with the Scheme combining with effects associated with other developments. The list of developments has been narrowed down to focus on those developments which are most likely to give rise to cumulative effects. A long-list was generated which was then refined following consultation with relevant local planning authorities, this short-list forms the basis of this assessment.

16.9.133 A short list of cumulative developments/allocations can be found in **ES Appendix 2.4: Cumulative Schemes [APP/6.4]**.

Relevant Developments

16.9.134 Those developments which have the potential to result in cumulative effects on waste within the associated study area are set out in Table 16-12. The remaining schemes are not considered to have likely significant cumulative effects on within the waste study area.

Table 16-12 Short List Developments/Allocations Relevant to Waste

Short List Ref	Planning Ref	Description	Distance from the Scheme	Waste Assumption
NSIP 1	EN0110010	High Grove Solar Solar PV DCO with generating capacity of ~720 MW.	Adjacent to the Order limits	Similar waste streams as the Scheme. Scale multiplier ×1.44 Construction, Operation, Replacement, Decommissioning
NSIP 7	EN0110014	East Pye Solar Solar PV DCO with generating capacity of ~500 MW.	40 km	Similar waste streams as the Scheme. Scale multiplier ×1.0 Construction, Operation, Replacement, Decommissioning
NSIP 29	EN020027	Norwich to Tilbury – National Grid Electricity Transmission (NGET) Upgrades to the 400 kV power network including a new 400 kV substation.	37 km	Key waste streams: pylons, conductors, soil and haul routes Construction
NSIP 30	EN010109	Equinor – Sheringham and Dudgeon Extension Projects (onshore components only)	28 km	Key waste streams: excavation, soils, temporary construction features Construction, Decommissioning

Short List Ref	Planning Ref	Description	Distance from the Scheme	Waste Assumption
		Up to 719 MW offshore wind farm: onshore connection to National Grid.		
NSIP 31	EN010080	Ørsted – Hornsea Project Three Offshore Wind Farm (onshore components only) Up to 2,400 MW offshore wind farm.	30 km	Construction likely completed ahead of 2031 Decommissioning
NSIP 32	EN0110048	Longmarsh Green Energy Solar PV DCO with generating capacity of ~1,300 MW with BESS infrastructure ~1,000 MW data centre.	6.2 km	Similar waste streams as the Scheme regarding solar and BESS. Scale multiplier ×2.6 Construction, Operation, Replacement, Decommissioning Additional waste streams from data centre Construction, Operation, Replacement
TCPA 1	3SO/2024/ 0002/SCO	Great Friars Farm Scoping Opinion Request for 400,000 bird broiler farm	1 km	Predominant waste stream from poultry manure Operation

Short List Ref	Planning Ref	Description	Distance from the Scheme	Waste Assumption
TCPA 2	3SR/2021/ 0001/SCO	South side of Swangey Lane Scoping Opinion Request for 8 poultry houses	26 km	Predominant waste stream from poultry manure Operation
TCPA 3	3SO/2020/ 0002/SCO	Primrose Green Farm Scoping Opinion Request for upgrade of existing poultry unit	24 km	Predominant waste stream from poultry manure Operation
TCPA 6	3SO/2017/ 0003/SCO	Great Ellingham Scoping Opinion Request to erect 3 replacement poultry sheds	23 km	Predominant waste stream from poultry manure Operation
TCPA 32	3PL/2022/1215/F	Low Carbon Solar Park 15 – Great Dunham Solar PV and BESS development with generating capacity of ~50 MW.	Immediately adjacent	Similar waste streams as the Scheme. Scale multiplier ×0.1. Construction, Decommissioning
TCPA 33	PL/2025/1791/SCO PL/2025/0980/SCR	Cokesford Poultry Farm 4 replacement poultry breeder sheds and ancillary development	10 km	Predominant waste stream from poultry manure Operation

Short List Ref	Planning Ref	Description	Distance from the Scheme	Waste Assumption
TCPA 34	PL/2025/1516/SCR	Radiance Energy, Weasenhall All Saints Screening Opinion for a ~100 MW Solar PV development (assumed maximum)	8 km	Similar waste streams as the Scheme. Scale multiplier ×0.2. Construction, Decommissioning
TCPA 36	22/00704/FM	Sedgeford Hall Solar development with capacity of 21 MW and 10 MWh BESS	22 km	Similar waste streams as the Scheme. Scale multiplier ×0.04. Construction, Decommissioning
TCPA 37	18/02289/OM	Land at West Winch Residential development of 500 dwellings	14 km	Excluded as considered part of West Winch Growth Area Strategic Policy (cumulative scheme LPA 13)
TCPA 38/39	23/02119/CM 23/02120/CM	Grandcourt Quarry Extension to silica sand extraction operations	10 km	Operation
LPA 5	KLWN Policy E1.12	Sites at Hardwick and Saddlebow 50 ha allocation for employment development	15 km	Construction, site clearance, and potential demolition waste during overlapping construction phase. Construction

Short List Ref	Planning Ref	Description	Distance from the Scheme	Waste Assumption
LPA 8	KLWN Policy E4.1	Knight's Hill 37 ha allocation for at least 600 dwellings	15 km	Construction, site clearance, and potential demolition waste during overlapping construction phase. Construction
LPA 13	KLWN Policy E2.1 (replacement)	West Winch Growth Area Strategic Policy At least 2,500 new dwellings, together with associated facilities and infrastructure	14 km	Construction, site clearance, and potential demolition waste during overlapping construction phase. Construction
LPA 18	NNDC (proposed) Policy F01/B	Land North of Rudham Stile Lane Proposed 26.5 ha allocation for approximately 560 dwellings	21 km	Construction, site clearance, and potential demolition waste during overlapping construction phase. Construction

16.9.135 The developments listed in Table 16-12 above have been considered as likely to contribute towards a considerable uplift in waste arisings within the temporal and geographic scope of this assessment. This is based on likely construction, operational, and decommissioning phases for the developments assessed, and their scale to qualitatively determine the likelihood of significant effects. This assessment relies on assumptions from published information, and where unavailable, has relied on assumption based on the Scheme itself.

Construction Phase

16.9.136 The cumulative construction phase considers the worst-case scenario that all of the assessed developments are undertaken within a time period in which landfill void capacity for inert waste in the East of England, and hazardous waste across England nationally, is unchanged from 2023-based values. This cumulative assessment does not consider waste handling capacity as it is not considered likely that all of the assessed developments will have overlapping construction phases.

16.9.137 With respect to the Scheme, East Pye Solar and High Grove Solar, inert waste arisings from construction are estimated to total 126,000 m^3 of C&D waste. Estimated arisings from the construction of 50 ha of employment land and up to 3,600 dwellings (based on shortlisted allocations LPA 5, 8, 13, and 18) is a further 1.04 million m^3 of C&D waste. Waste forecasts for the construction of onshore elements of the Sheringham and Dudgeon Extension DCO project are estimated at a total 665,000m^3 of C&D waste. The construction of the Norwich-Tilbury high voltage connection DCO project by National Grid Electrical Transmission is estimated to result in up to 2.23 million m^3 of inert waste, the vast majority of which is due to come from temporary haul route substrate and surfacing. There are also three solar TCPA projects for which inert waste arisings from construction are estimated to total 12,300 m^3. Finally, the Longmarsh Green Energy project is anticipated to generate an estimated 95,200 m^3 of C&D waste from solar and BESS infrastructure and approximately 150,000 m^3 of C&D waste for the proposed data centre.

16.9.138 Taking an absolute worst-case scenario that this is disposed to landfill in the East of England, the cumulative inert waste quantity would be approximately 4.31 million m^3, representing approximately 7.35% of inert or non-hazardous landfill void capacity for this region. Approximately 52% of this is due to arise from the Norwich-Tilbury DCO project alone, while a substantial proportion of the remainder of this (up to 28%) is likely to come from soil waste arising from ground clearance on greenfield development, and as such, is likely to be subject to onsite construction waste management strategies associated with each of the assessed developments. Therefore, the cumulative magnitude of impact to inert and non-hazardous waste void capacity is moderate. Due to it being assigned a low sensitivity during the construction phase of the Scheme, the effect is a cumulative slight adverse, which is considered **not significant**.

16.9.139 The six assessed DCOs and three solar TCPA projects are not anticipated to generate substantial hazardous waste during construction. The construction of the data centre as part of the Longmarsh Green Energy project, 50ha of employment land and up to 3,600 dwellings (based on shortlisted allocations LPA 5, 8, 13, and 18) is anticipated to generate

up to 23,800m^3 of hazardous waste, largely anticipated to be generated from likely contaminated soils.

16.9.140 Hazardous waste statistics (Ref 16-13) identify that on average in 2023, 11.6% of hazardous waste was sent to landfill. Taking this as a worst-case scenario, the resultant quantity of 2,560 m^3 likely to be sent to landfill would constitute up to 0.026% of hazardous landfill void capacity in England. This would constitute a cumulative negligible magnitude impact to a very high sensitivity receptor, and as such would be a cumulative slight adverse effect. This is therefore **not significant**.

Operational Phase

Operation and Maintenance

16.9.141 During their operational lifetimes, the Scheme, the five DCOs (NSIP 1, 7 and 29-31), the solar and BESS elements of the Longmarsh Green Energy project (NSIP 32), and the three TCPA Solar projects (TCPA 32, 34 and 36) are likely to generate no more than negligible inert and hazardous waste. During their operational lifetimes, the assessed cumulative employment and residential developments are anticipated to generate a steady, but not substantial stream of waste relating to commercial and household activities respectively.

16.9.142 Operational waste associated with the data centre as part of the Longmarsh Green Energy project is likely to be largely driven by general waste for operational staff, and electronic and potentially hazardous waste from operational and maintenance requirements for data servers, cooling systems, and supporting infrastructure (Ref 16-31, Ref 16-32). The quantity of waste generated during the operational lifetime of data centres in the UK has limited published information.

16.9.143 The extension proposals associated with Grandcourt Quarry are not anticipated to generate significant waste material. As identified within the Environmental Impact Assessment for this development (Ref 16-28), extracted materials comprising soils, overburden and mineral would either be transferred to the Leziate Plant Site for processing (mineral) or utilised in the restoration and landscaping of the Site (soils and overburden). Tailings (comprising silt and fine sand) generated through sand processing at the Leziate Plant Site would continue to be managed through the existing water management system and incorporated into the final restoration of the Holt House Quarry site.

16.9.144 The cumulative assessment has also identified five poultry developments (shortlisted reference TCPA 1, 2, 3, 6 and 33) that may generate substantial waste during their operational lifetime. This is in consideration of recent case law (Ref 16-29) in which it has been determined that poultry manure is considered as waste, rather than an agricultural by-product. That notwithstanding, the quantum of poultry manure waste likely to be generated is not anticipated to generate a significant effect with respect to waste handling capabilities for industrial and agricultural waste in Norfolk or the East of England. Furthermore, waste associated with the occupation of residential dwellings or the long-term operation of employment use from shortlisted allocations LPA 5, 8, 13, and 18 are

not anticipated to significantly increase general household, or commercial and industrial (C&I) waste in the East of England above current or forecasted quantities.

Peak Replacement Scenario

16.9.145 The Scheme, East Pye Solar, High Grove Solar, and the solar and BESS elements of the Longmarsh Green Energy project are anticipated to have significantly overlapping operational lifetimes, and as such, are likely to have similar requirements with regard to infrastructure replacement during their lifetimes, including a likely scenario where onsite solar and BESS infrastructure is renewed. In a worst-case scenario that these happen in a similar timeframe, inert waste arisings from this cumulative replacement scenario are estimated to total 173,000m^3 of C&D waste. Arisings from employment and residential development has not been considered. The Norwich-Tilbury project, offshore wind DCOs, and TCPA solar developments are unlikely to have more than ad hoc operational and maintenance requirements, and therefore minimal operational waste streams. Taking an absolute worst-case scenario that this is disposed to landfill in the East of England, this is equivalent to 0.29% of inert or non-hazardous landfill void capacity for this region. The cumulative magnitude of impact to inert and non-hazardous waste void capacity is therefore negligible. Due to it being assigned a medium sensitivity, the effect is a cumulative neutral to slight adverse, which is considered **not significant**.

16.9.146 For the recycling and recovery of WEEE and waste batteries, the four assessed solar DCOs are anticipated to share similar commitments to achieving *"Best Available Treatment Recovery and Recycling Techniques"* which indicatively demonstrate that 95% of WEEE can be recycled or recovered. This is also assumed to apply to electronic waste from the data centre as part of the Longmarsh Green Energy project, which may also need to be replaced at a similar time. Estimates for waste quantities have been made at a very high level given the lack of information available directly in relation to the Longmarsh Green Energy project. The future economic value of solar and BESS waste or end-of-life data infrastructure is anticipated to encourage technological advancement to increase the amount of materials that are reused or recycled, reducing future landfill need. As such, an estimated worst-case of 16,600m^3 (~21,900 tonnes) of WEEE and waste batteries generated by the cumulative replacement scenario is anticipated to go to landfill following treatment. This therefore is equivalent to 0.17% of the national landfill void capacity for hazardous waste (as of 2023). The cumulative magnitude of impact to hazardous waste void capacity is therefore considered to be minor. Due to the receptor's very high sensitivity, the effect is moderate or large adverse, which is therefore considered to be a **significant effect**.

Decommissioning Phase

16.9.147 The Scheme, East Pye Solar DCO, and the Longmarsh Green Energy project are anticipated to have up to a 60 year operational lifetime, while the High Grove Solar DCO is anticipated to have up to a 40 year operational lifetime. However, in considering a worst-case scenario in which all four DCOs are decommissioned after approximately 40 years, there is a scenario in which waste arisings from decommissioning could have a cumulative effect on waste handling capabilities and landfill void capacity. The three TCPA solar

projects are also anticipated to have up to a 40 year operational lifetime and so will be included within the assessment. The decommissioning of the assessed developments is likely to generate considerable amounts of inert waste: such as from cabling, solar mounting structures, foundations, aggregates and enclosures – and large amounts of WEEE and BESS waste.

16.9.148 For Hornsea Three, decommissioning is assumed to take place after 35 years of operation; however, given that the lease period extends to 50 years, there may be potential for lifetime extension or repowering. For the Sheringham and Dudgeon Extension Project, the operational lifetime is assumed to be 40 years. It is acknowledged that no waste forecasts were provided within the project's waste assessment; however, the assessment (Ref 16-30) stated:

"Decommissioning of the onshore substation is likely to create significant quantities of non-hazardous and inert construction and demolition waste, mainly comprising excavated hardstanding, power equipment and cables, building waste and excavated soil".

16.9.149 For the purposes of this cumulative assessment, the differences in the nature of solar versus offshore wind DCO projects mean that only the decommissioning of onshore elements such as cabling and substations can be reasonably assumed.

16.9.150 For the purpose of this assessment, it is assumed that the Norwich-Tilbury DCO project, and the data centre and grid infrastructure as part of the Longmarsh Green Energy project, shortlisted poultry development, and employment and residential allocations are permanent, and therefore do not have a projected decommissioning phase.

16.9.151 Applying current baseline conditions to estimate future conditions for C&D waste handling in Norfolk, the cumulative decommissioning is anticipated to generate a substantial amount of inert waste. Taking an absolute worst-case scenario that all C&D waste generated during the decommissioning of all DCO Schemes (except Norwich-Tilbury) and all TCPA solar developments (by volume 934,000m^3) is disposed to landfill in the East of England, this is equivalent to 1.59% of inert or non-hazardous landfill void capacity for this region. Therefore, the cumulative magnitude of impact to inert and non-hazardous waste void capacity is minor. Due to future inert and non-hazardous landfill void capacity being assigned a high sensitivity (as there is no long term forecasting for up to the 2090s), the effect is a cumulative moderate adverse effect, which is therefore considered to be **significant**.

16.9.152 As during their operational lifetimes, the assessed DCOs are anticipated to be committed to achieving *"Best Available Treatment Recovery and Recycling Techniques"* which indicatively demonstrate that 95% of WEEE from decommissioning can be recycled or recovered (see Table 16-7). This is considered to apply directly to Solar PV infrastructure, BESS infrastructure, and large-scale installations such as Inverters and Transformers. All of these are likely to be managed by specialist contractors who are likely to achieve high recovery and recycling rates. As such, an estimated worst-case of 34,200m^3 (~36,000 tonnes) of WEEE, BESS, and large-scale installations generated by the decommissioning of these cumulatively assessed DCOs is anticipated to go to landfill following treatment.

This therefore is equivalent to 0.35% of the national landfill void capacity for hazardous waste (as of 2023).

16.9.153 Together, the cumulative magnitude of impact to hazardous waste void capacity is therefore considered to be minor. Due to the receptor's very high sensitivity, the effect is a cumulative moderate or large adverse effect, which is considered **significant**. This, however, should be understood in the context of a lack of forecasting for hazardous waste landfill void capacity, and a lack of forecasting of the quantum of specialist solar and BESS waste management facilities that are likely to arise to meet future demand. The future economic value of solar and BESS waste is anticipated to encourage technological advancement to increase the amount of materials that are reused or recycled, reducing future landfill need.

Additional Mitigation for Cumulative Effects

16.9.154 To address the cumulative significant effect on hazardous landfill void capacity identified during a cumulative peak replacement scenario, and as per the **oOEMP [REP5-066]**, the operational Waste Management Strategy must ensure that both hazardous waste handling capabilities are assessed based on up-to-date information at the time of drafting prior to peak replacement works (here meaning the replacement of all PV panels and BESS modules) being undertaken. Where a significant cumulative effect on hazardous waste handling facilities from replacement activities across multiple NSIPs are assessed as likely to occur, a coordinated approach between site operators of those relevant NSIPs should be secured ahead of the commencement of those replacement activities. This should include measures, as necessary, to stagger peak replacement works across NSIPs. This is so that the delivery of hazardous waste arisings requiring treatment to relevant facilities can be spread to reduce overloading of those facilities. Suitable and safe hazardous waste storage will be secured if required to delay delivery to hazardous waste treatment facilities.

16.9.155 Per the oDS **[REP3-067]**, the Decommissioning Waste Management Strategy must ensure that both non-hazardous and hazardous waste handling capabilities are assessed based on up-to-date information at the time of drafting prior to decommissioning works being undertaken. Where significant cumulative effects on both non-hazardous and hazardous waste handling facilities and landfill void capacity from decommissioning of multiple Nationally Significant Infrastructure Projects are assessed as likely to occur, a coordinated approach between site operators of those relevant NSIPs should be secured ahead of the commencement of decommissioning activities. This should include measures, as necessary, to: stagger decommissioning works across Nationally Significant Infrastructure Projects; stagger the delivery of non- hazardous and hazardous waste arisings requiring treatment to relevant facilities; and secure suitable and safe hazardous waste storage if required to delay delivery to hazardous waste treatment facilities, so as to reduce overloading of those facilities.

Conclusion

16.9.156 This assessment section has set out and assessed the likely effects of the Scheme in relation to waste. Likely effects have been assessed for the construction, operational and decommissioning phases of the Scheme. Following the implementation of embedded mitigation, as detailed in paragraphs above, residual effects have not been identified in relation to waste during the construction, operational and decommissioning phases. The assessment of cumulative effects has identified likely significant effects during the operational and decommissioning phase of the Scheme.

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