

Steeple Renewables Project

Chapter 17: Miscellaneous Issues

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Chapter 17: Miscellaneous Issues

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17. Miscellaneous Issues

17.1 Introduction

17.1.1 This chapter considers other topics that do not require individual Chapters due to the brevity of the assessment of the small impact associated with the Proposed Development.

17.1.2 This chapter describes and assesses the potential effects of the Proposed Development with regard to:

- Electric, Magnetic and Electromagnetic Fields (Section 17.3);
- Telecommunications and Utilities (Section 17.4);
- Waste (Section 17.5); and
- Major Accidents and Disasters (Section 17.6).

17.1.3 The baseline conditions have been established through desk-based assessment and consultation in relation to the topics covered by this chapter, where appropriate. The assessment methods used within this chapter are described in greater detail in the relevant subsections below.

17.1.4 Relevant legislation and guidance have been considered within the assessments set out below.

17.2 Assessment Methodology

17.2.1 The Proposed Development has been assessed based on the likely worst-case parameters/scenarios as per the 'Rochdale Envelope' approach. **Chapter 4: Proposed Development [EN010163/APP/6.2.4]** sets out the description of the Proposed Development which has been used for the assessments set out below.

17.2.2 In undertaking the assessment of those topics set out in Paragraph 17.1.2 of this Chapter, consideration has been given to the EIA Scoping responses and Section 42 Responses and other consultation undertaken as detailed in Table 17.1 below.

Table 17.1: EIA Scoping Consultation Responses

Scoping / Other Consultation	Summary of Consultation Response	How is this addressed
Planning Inspectorate		
Major Accidents and Disasters	<i>"The Inspectorate considers that, for the avoidance of doubt, the risk of fire associated with battery storage facilities should be assessed in the ES and relevant mitigation, such as fire-fighting and containment measures, should be set out and secured in the Development Control Order (DCO), with reference to a Battery Safety Management Plan for example."</i>	No standalone ES chapter is proposed to assess the impacts of fire risk associated with battery storage facilities, however consideration and assessment of risk of battery fire / explosion has been undertaken within this chapter and once the detailed design has been approved, further detail will be provided within the Major Accidents and Disasters section of this ES and an accompanying Outline Fire Risk Management Plan (Appendix 4.3, EN010163/APP/6.3.4)] .
Electric, Magnetic and Electromagnetic Fields	<i>"The Applicant considers that the most significant EMF sources for the Proposed Development are likely to be the cable routes and associated infrastructure that connect the Proposed Development to the National Grid infrastructure at West Burton Power Station, and the scope of the assessment of EMFs in the ES is limited to the operational impact / consideration of any cables associated with the development which exceed 132kV. The only part of the Proposed Development likely to exceed this voltage is the underground export cables between the onsite substation and the existing West Burton substation which will likely be an underground 400kV cable".</i>	No standalone ES chapter is proposed to assess the impacts on EMF sources for the Proposed Development, but an Electric, Magnetic and Electromagnetic Fields section is included within this chapter assessing where relevant the cable systems above 132kV and that have potential to cause EMF effects.
Waste	<i>"The ES should assess any impacts from off-site transport and disposal of waste</i>	No standalone ES chapter is proposed to assess Waste, but

Scoping / Other Consultation	Summary of Consultation Response	How is this addressed
	<p><i>generated during construction and decommissioning which are likely to result in significant effects. Any assumptions made, such as with regard to quantities of contaminated material, should be clearly set out and justified in the ES.</i></p> <p><i>The CEMP and Outline Decommissioning Environmental Management Plan (ODEMP) should include as much detail as possible on how waste would be managed in accordance with the waste management hierarchy, including any end use of the PV panels.”</i></p>	<p>Waste is included as a section within this chapter. The accompanying Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]) and the Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) submitted as part of this DCO application include details of how waste is managed in accordance with the waste management hierarchy.</p>
Bassetlaw District Council		
Waste	<p><i>“Consideration should be given to the impact of waste generated from the construction/decommissioning phase and or end of life solar arrays requiring replacement in terms of how and where it is disposed of and transportation away from the site. There are other solar schemes in the area that are operating on similar time scales therefore there is the potential for significant amounts of waste if this is not carefully considered.”.</i></p>	<p>No standalone ES chapter is proposed to assess Waste, but Waste is included as a section within this chapter assessing all phases of development (construction, operation and decommissioning) and the potential for cumulative effects. The accompanying Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]) and the Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) submitted as part of this DCO application include details of</p>

Scoping / Other Consultation	Summary of Consultation Response	How is this addressed
		how waste is managed in accordance with the waste management hierarchy.
Lincolnshire County Council		
Waste	<i>"Further consideration should be given to the impact of waste generated from the decommissioning phase and/or end of life solar arrays requiring replacement, in terms of how and where it is disposed of and its transportation from the site. Given the number of other solar schemes in the locality that would be operating on similar timescales there is potential for significant amounts of waste to be generated at this stage. The impact from replacement and/or decommissioning should also be considered cumulatively with these other developments."</i>	No standalone ES chapter is proposed to assess Waste, but Waste is included as a section within this chapter assessing all phases of development (construction, operation and decommissioning) and the potential for cumulative effects. The accompanying Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]) and the Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) submitted as part of this DCO application include details of how waste is managed in accordance with the waste management hierarchy.
Health and Safety Executive		
Major Accidents and Disasters	<i>"The Applicant should make contact with West Burton A Power Station, to inform an assessment of whether or not the Proposed Development is vulnerable to a possible major accident. Additionally, the Applicant should make contact with Bassetlaw District Council to establish the hazardous substance consent for the site."</i> <u>Consideration of risk assessments</u>	The Applicant has undertaken meetings with UK Atomic Energy Authority (UKAEA) and EDF to discuss arrangements for access and the construction principles regarding the grid connection cable. No consultation response has been received from West Burton A Power Station. Further information

Scoping / Other Consultation	Summary of Consultation Response	How is this addressed
	<p><i>“Regulation 5(4) of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 requires the assessment of significant effects to include, where relevant, the expected significant effects arising from the proposed development’s vulnerability to major accidents.”</i></p> <p><u>Explosive Sites</u></p> <p><i>HSE has no comment to make as there are no licensed explosives sites in the vicinity.</i></p> <p><u>Electrical Safety</u></p> <p><i>No comment from a planning perspective.</i></p>	<p>on hazardous substance consent will be sought from BDC to accompany the DCO application.</p> <p>The Applicant notes HSE’s response regarding explosive sites and considers no further action is required as none are within the vicinity of the Proposed Development.</p> <p>Electrical Safety is assessed within various sections of this ES Chapter.</p>

Table 17.2 – Section 42 Responses

Scoping / Other Consultation	Issues Raised	Response / Action Taken
Nottinghamshire County Council		
Waste	<p><i>The PEIR does not appear to have considered the adopted Waste Core Strategy, saved policies of the Waste Local Plan nor the emerging Waste Local Plan in Chapter 6 – Planning Policy of Volume 2. Whilst not a waste proposal, the Waste Core Strategy contains two policies which are relevant to this development consent order: WCS2 and WCS10, with the new Waste Local Plan containing similar policies, SP1 and SP8 respectively.</i></p> <p><i>Policies WSC10 and SP8 both seek to safeguard operational and permitted</i></p>	<p>As noted, the Proposed Development is not a waste proposal. There are no waste facilities existing (or historical) within the Order Limits, and therefore there is no safeguarding issue. The Planning Statement [EN010163/APP/7.1] outlines Waste at Section 6.14, confirming there is no safeguarding issue.</p>

Scoping / Other Consultation	Issues Raised	Response / Action Taken
	<p>waste management facilities. There are no waste facilities within the proposal area and so the County Council therefore do not consider there to be a safeguarding issue, but this should be detailed in the Supporting Planning Statement.</p> <p>In terms of WCS2 and SP1, both policies seek for all developments to be designed, constructed and operated to minimise the creation of waste and maximise the recycling and recovery of waste. These policies are aimed at managing waste as high up the waste hierarchy as possible and to avoid the disposal of materials. Chapter 17 – Miscellaneous Issues includes a section on waste where it is outlined that a detailed Environmental Management Plan will be prepared for the construction and decommissioning phases, looking to control and manage waste on-site. The proposal also seeks to minimise waste, maximise re-use and recycling opportunities and so following the waste hierarchy. The application therefore appears to be in line with Policies WCS2 and SP1 and the promoter should address this within the future Supporting Planning Statement.</p>	<p>The Waste Section of this ES Chapter details the Proposed Development is designed, constructed and to be operated under the 'Waste Hierarchy' guidance and abide by the principles of sustainable waste management. An Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]) and the Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) are submitted with the DCO application. The Applicant agrees that the Proposed Development is in line with Policies WCS2 and SP1 – this is addressed in Appendix C- Local Planning Policy Accordance Table of the Planning Statement [EN010163/APP/6.3.4].</p>
Waste	<p>When considering the Cumulative effects of waste, the promoter in paragraph 17.6.42 notes that there are several potential schemes that could result in cumulative volumes of waste at the decommissioning stage. This could then create pressure on the capacity of local recycling plants or landfill sites, with the industry for recycling solar panels still emerging but expected to have advanced by the end of proposal's operational life. The promoter</p>	<p>Within the Waste section of this ES Chapter, cumulative effects are assessed for the Proposed Development. An Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]) and the Outline Decommissioning Plan (Appendix 4.2,</p>

Scoping / Other Consultation	Issues Raised	Response / Action Taken
	<p><i>recommends this would be managed through the CEMP and decommissioning schemes, with consultation undertaken with waste management providers to ensure waste could be accommodated. The County Council welcomes the acceptance of the cumulative impact of this proposal with others in terms of potential decommissioning waste volumes. Very significant volumes of PV panels would need to be disposed of or recycled and whilst it is preferable that the panels are recycled, it should be noted that such industry, on the scale required, is not established. Other NSIP schemes in the area, for example Gate Burton, considered the worse-case scenario that the panels would need to be disposed of. The County Council believes such an approach should continue to be taken, with consideration given to whether additional disposal capacity requirements would be required with reference to the current capacity forecasts set out in the Nottinghamshire and Nottingham Waste Needs Assessment that accompanies the emerging Waste Local Plan. This would lead to potential understanding of capacity requirements, which the Council could consider in future Plans.</i></p>	<p>[EN010163/APP/6.3.4]) are submitted with the DCO application, and detailed versions will be prepared in consultation with waste management providers to ensure waste could be accommodated post-consent. The Applicant retains that the main elements of the Proposed Development are all capable of being recycled, with recycling routes generally available for the materials.</p>
Environment Agency		
General	<p><i>The potential thermal implications of buried cables, in relation to risks to groundwater.</i></p>	<p>The Applicant acknowledges heat can be a groundwater pollutant, and this could be caused by thermal transmission from high voltage (HV) underground cables. The Applicant confirms no sensitive abstractions or</p>

Scoping / Other Consultation	Issues Raised	Response / Action Taken
		protected habitats have been identified that could be affected by this impact. The Hydrology, Hydrogeology, Flood Risk and Drainage Chapter of the ES [EN010163/APP/6.2.8] assesses the impacts of heating of groundwater from HV cables. The assessment determines the residual effects as negligible and not significant. Additionally, it is also likely bentonite, or concrete will be used to reduce cable separation, however, this is subject to the final detailed design.
Waste	<i>Possible construction waste identified in 17.6.17 does not include surplus soil from earthworks. While the volumes generated may be small, all waste must be handled appropriately and legally. Contaminated soil will need additional control measures.</i>	An Outline Soil Management Plan [EN010163/APP/6.3.15] accompanies the DCO application and sets out how soils (topsoil and subsoil) will be protected during the construction phase, and any damage to soil structure will be rectified as part of the construction phase. All soil to be reused onsite or disposed of offsite will be appropriately characterised by the construction contractor. Soil will be managed in line with Defra “Construction Code of Practice for the Sustainable Use of Soils on Construction Sites” (Defra, 2009).

Scoping / Other Consultation	Issues Raised	Response / Action Taken
Major Accidents and Disasters	<i>Receptors for fire need to include land, surface water and groundwater.</i>	<p>The Major Accidents and Disasters section of this ES Chapter assesses the risk of fire to relevant local residents, habitats and species, landscape features, surface water and groundwater.</p> <p>Embedded mitigation through the careful design of the Proposed Development and additional mitigation measures are secured in the unlikely event of an uncontrolled fire through the following documents -</p> <p>Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]),</p> <p>Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) and</p> <p>Outline Fire Risk Management Plan (Appendix 4.3, [EN010163/APP/6.3.4]).</p> <p>The Hydrology, Hydrogeology, Flood Risk and Drainage Chapter of the ES [EN010163/APP/6.2.8] further outlines the potential effects of firewater and contaminated runoff.</p> <p>The risk of fire as a major accident and disaster is determined as a not significant residual effect.</p>
North Leverton Parish Council		

Scoping / Other Consultation	Issues Raised	Response / Action Taken
Electric, Magnetic and Electromagnetic Fields	<i>Electromagnetic Fields - The report states that given the route of the cabling there does not need to be any mitigation measures in place. However, the report also states that as yet, the length and the route of the cabling is unknown. There may need to be mitigating factors in place.</i>	Electric, Magnetic and Electromagnetic Fields (EMFs) are assessed in this section of this ES Chapter. The scope of the assessment of EMFs is limited to consideration and assessment of any cables associated with the Proposed Development which exceed 132kV. The only part of the Proposed Development to exceed this voltage is the underground export cable between the Proposed Development and the existing West Burton Power Station substation, which will be an underground 400kV cable system. The assessment determines no significant effects from EMFs will be caused and therefore additional mitigation measures are not required.
UK Health Security Agency		
Major Accidents and Disasters	<i>The current submission does not consider in detail any risks or impacts that might arise as a result of accidents such as fires. The development will incorporate lithium-ion batteries to store the energy captured. It is recognised that there is a risk of spontaneous ignition with these which could lead to a range of pollutants being emitted with the potential for adverse human health effects. In the event of a fire, a mixture of substances would be released into the environment which could impact health. Given the proximity of the development to residential properties it</i>	The Major Accidents and Disasters section of this ES Chapter assesses the risk of an uncontrolled fire event to relevant local residents, habitats and species, landscape features, surface water and groundwater. It is acknowledged that in the unlikely event of a fire, air pollutants could be released. However, the Applicant maintains that through appropriate mitigation

Scoping / Other Consultation	Issues Raised	Response / Action Taken
	<p>would be useful to give some consideration to what products of combustion could be released from the site infrastructure during a major fire and any other potential emissions from the battery storage units and how these accidents could affect people's health.</p> <p>We recommend that accidents and fires which could cause an uncontrolled release to the environment should be considered in the ES.</p>	<p>measures secured through the Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]), Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) and Outline Fire Risk Management Plan (Appendix 4.3, EN010163/APP/6.3.4]) the risk is low and not assessed further.</p>
Lincolnshire County Council		
Waste	<p>LCC welcomes the inclusion of waste within the miscellaneous issues chapter of the PIER. LCC is pleased to see the implementation of the waste hierarchy. It is noted that due to the proposed longevity of the scheme final waste destinations are unable to be certain, LCC welcomes the intension to reuse and recycle where possible. However, as there are currently limited recycling opportunities for solar PV panels the worst-case scenario should also be assessed should the anticipated recycling facilities not arise.</p>	<p>The Waste Section of this ES Chapter details the Proposed Development is designed, constructed and to be operated under the 'Waste Hierarchy' guidance and abide by the principles of sustainable waste management. An Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4]) and the Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4]) are submitted with the DCO application, and detailed versions will be prepared in consultation with waste management providers to ensure waste could be accommodated post-consent. The Applicant retains that the</p>

Scoping / Other Consultation	Issues Raised	Response / Action Taken
		main elements of the Proposed Development are all capable of being recycled, with recycling routes generally available for the materials.
Health and Safety Executive		
Major Accidents and Disasters	<i>Within the PEIR Chapter 17: Miscellaneous Issues Table 17.1: Consultation responses, in response to HSE comment within the EIA Scoping Consultation the applicant has responded "Details relating to consultation with West Burton A Power Station, and any future assessment (if required) will be set out within the subsequent ES." Within the current PEIR Section 17.7 Major Accidents and Disasters there is some consideration of events occurring from, or impacting, the development. HSE would advise these matters are considered further in line with Advice Note 11 Annex G taking account of the following: "it may be beneficial for applicants to undertake a risk assessment as early as possible to satisfy themselves that their design and operation will meet the requirements of relevant health and safety legislation as design of the Proposed Development progresses." Note, that there are no requirements for any risk assessments submitted to and approved by the relevant planning authority to also be considered by HSE.</i>	The Applicant confirms the design of the Proposed Development, and its main components have been sited carefully to avoid impacting West Burton A Power Station. The design of the Proposed Development is in accordance with relevant Health and Safety Legislation, and the health and safety of workers in the construction, operation and decommissioning stages of the Proposed Development has been assessed in the Major Accidents and Disasters section of this ES Chapter. No consultation response has been received from West Burton A Power Station.

17.3 Electric, Magnetic and Electromagnetic Fields

Introduction

- 17.3.1 This section of the Chapter sets out the assessment of potential electric, magnetic and electromagnetic fields (EMFs), telecommunications and utilities effects that could arise from the Proposed Development.
- 17.3.2 Power frequency EMFs arise from generation, transmission, distribution and the use of electricity. They occur around power lines and electricity cables and around domestic, office or industrial equipment that uses electricity. Electric fields are the result of voltages applied to electrical conductors and equipment. Fences, scrub and buildings can block electric fields. Magnetic fields are produced by the flow of current, however, most materials do not readily block magnetic fields. The intensity of both electric fields and magnetic fields diminishes with increasing distance from the source.
- 17.3.3 EMFs are inevitable wherever electricity is produced, distributed, and used, including electrical substations, power lines and electric cables and around domestic, office or industrial equipment that uses electricity.
- 17.3.4 Electric fields depend on the operating voltage of the equipment. Magnetic fields depend on the electrical currents flowing and are not significantly limited by most common materials. Typically, ground level magnetic fields from underground cables fall much more rapidly with distance than those from a corresponding overhead line but can be higher at small distances from the cable.
- 17.3.5 Magnetic fields are produced by the flow of electric current; however, most materials do not readily block magnetic fields. The intensity of both electric fields and magnetic fields diminishes with increasing distance from the source. Magnetic fields depend on the electrical currents flowing and are not significantly limited by most common materials. Typically, ground-level magnetic fields from underground cables fall much more rapidly with distance than those from a corresponding overhead line, but can be higher at small distances from the cable.

Policy Context

- 17.3.6 There is no direct statutory provision in the planning system relating to protection from EMFs; however, the National Policy Statement for Electricity Networks

Infrastructure (NPS EN-5)¹ requires an applicant to consider the following aspects, with regards to Electric and Magnetic Fields:

- Compliance with Electricity Safety Quality and Continuity Regulations 2002 (ESQCR)²;
- Health Protection Agency (HPA) guidance³; and
- The introduction of optimal phasing of high voltage overhead power lines wherever possible and practicable in accordance with the Code of Practice to minimise effects of EMFs. The Code of Practice is used to show compliance with guideline public exposure limits for NSIPs in England and Wales.

- 17.3.7 Section 2.9 of NPS EN-5 acknowledges that all overhead lines produce both electric fields and magnetic fields. The fields will be highest directly under the conductors and will reduce dramatically as the distance from the line increases. The electric fields produced by overhead lines are also attenuated significantly by structures such as fences, walls, trees and hedges. As recognised by NPS EN-5, putting cables underground eliminates the electric field but underground cables can still produce magnetic fields. Again, the magnetic fields produced by underground cables drop rapidly as the distance from the cable increases.
- 17.3.8 The Electricity at Work Regulations 1989⁴ places duties on employers and employees with respect to health and safety when working on or with electrical equipment and particularly those involved in the design, construction, operation or maintenance of electrical systems and equipment.
- 17.3.9 The Electricity Safety, Quality and Continuity Regulations 2002 and subsequent amendments (SI 1521/2006 and SI 639/2009) specify certain requirements for electrical infrastructure and equipment, including overhead lines and underground cables, intended for the safety and protection of workers and safeguarding of the general public from danger.
- 17.3.10 There are no statutory regulations in the UK that limit the exposure of the general public to power-frequency electric or magnetic fields, and responsibility for

¹ Department for Energy Security and Net Zero (2023) National Policy Statement for Electricity Networks Infrastructure [online] available

² UK Statutory Instruments (2002) The Electricity Safety, Quality and Continuity Regulations 2002 [online] available

³ HPA (2009) Application of ICNIRP Exposure Guidelines for 50 Hz Power Frequency Fields

⁴ HSE (2015) The Electricity at Work Regulations 1989 [online] available

- implementing appropriate measures for the protection of the public from EMF lies with the UK Government.
- 17.3.11 In 2004, the Government adopted guidelines published in 1998 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP) in line with the terms of the 1999 EU Council recommendation on limiting public exposure to EMF. These guidelines were transposed into the HPA guidance. The criteria establish acceptable limits for exposure of the public to EMF that adopt a precautionary approach taking into account various scenarios and potentially more vulnerable groups (such as infants).
- 17.3.12 Guidance documents on EMF exposure and appropriate design of electrical infrastructure include:
- Power Lines: Demonstrating compliance with EMF public exposure guidelines – a Voluntary Code of Practice (Department of Energy and Climate Change (DECC), March 2012)⁵; and
 - Power Lines: Control of micro shocks and other indirect effects of public exposure to electric fields - a Voluntary Code of Practice (DECC, July 2013)⁶.
- 17.3.13 The DECC (March 2012) guidance states that “*overhead power lines at voltages up to and including 132 kV, underground cables at voltages up to and including 132 kV and substations at and beyond the publicly accessible perimeter*” are not capable of exceeding the ICNIRP exposure guidelines and therefore no assessment is required for these and other types of infrastructure listed on the Energy Networks Association website.
- 17.3.14 National Grid guidance sets out that “*Underground cables, whether directly buried or in a tunnel, produce no external electric field.*”
- 17.3.15 Therefore, electric fields are not considered further in this assessment. Magnetic fields for the underground cabling system will be considered further in this assessment.

⁵ Department of Energy and Climate Change (2012) Power Lines: Demonstrating compliance with EMF public exposure guidelines [online] available

⁶ Department of Energy and Climate Change (2013) Power Lines: Control of Microshocks and other indirect effects of public exposure to electric fields [online] available

Assessment Methodology

- 17.3.16 The scope of the assessment of EMFs is limited to consideration of any cables associated with the Proposed Development which exceed 132kV. The only part of the Proposed Development to exceed this voltage is the underground export cable between the Proposed Development and the existing West Burton Power Station substation, which will be an underground 400kV cable system.
- 17.3.17 The ICNIRP ‘reference levels’ for the public are:
- 100 microteslas (μ T) for magnetic fields; and
 - 5 kV per metre for electric fields.
- 17.3.18 The occupational limits are double for electric fields and five times higher for magnetic fields:
- 500 microteslas (μ T) for magnetic fields; and
 - 10 kV per metre for electric fields.
- 17.3.19 If people are not exposed to field strengths above these levels, direct effects on the central nervous system would be avoided and indirect effects such as the risk of EMFs interfering with implantable medical devices will be minimised. The reference levels are not in themselves limits but provide guidance for assessing compliance with the basic restrictions and reducing the risk of indirect effects.
- 17.3.20 The ICNIRP guidelines outlines an assessment methodology as a structured approach below:
- Stage 1 – comparison of external fields to ICNIRP reference levels;
 - Stage 2 – if stage 1 identifies that an exceedance is above the reference levels, the results of the evaluation should be compared with the values of external fields required to produce the basic restrictions in the body; and
 - Stage 3 - to demonstrate compliance with basic restrictions, a detailed assessment should be carried out taking into account factors that represent the actual exposure conditions.
- 17.3.21 Following each stage of evaluation, if the results of the assessments are at or below the reference values, then compliance with the basic restrictions can be assumed.
- 17.3.22 Magnetic fields are not simply added together where they may be generated by separate sources and are typically dominated by the biggest source, therefore it is

appropriate to consider the magnetic field generated by the 400 kV cable system in isolation in areas where a magnetic field may be present from multiple sources. This is the approach taken in this assessment.

Baseline Conditions

- 17.3.23 The underground grid connection 400 kV cable system is less than 1km in length between the Onsite Substation and the existing West Burton 400kv Substation. It will be located on private land within the Order Limits that is not publicly accessible; however, the public and occupational exposure reference levels have been used in this assessment to ensure that there are no adverse effects on the closest publicly accessible areas (circa 320m west, Gainsborough Road) and residential areas (circa 210m west, St Ives).
- 17.3.24 A proposed connection point for the underground 400 kV cable system will be to the existing substation at the West Burton Power Station site that is located adjacent to the northern extent of the Site, which connects to the existing 400 kV overhead transmission network. This infrastructure also has the potential to generate EMFs as it includes equipment greater than 132kV.

Assessment of Likely Significant Effects

Construction and Decommissioning Phase

- 17.3.25 Effects during the construction and decommissioning phases of the Proposed Development are scoped out of the assessment as the cables will not produce any significant EMFs until the Proposed Development is generating electricity when it is operational.

Operational Phase

- 17.3.26 An underground high voltage 400kV cable system will be installed to connect the Proposed Development substation with the existing West Burton Power Station substation. The 400kV cable system is described in **Chapter 4: Proposed Development [EN010163/APP/6.2.4]**.
- 17.3.27 The highest EMFs produced by underground cables are located directly above the buried cables, and field strength decreases with distance from the source.
- 17.3.28 National Grid gives examples of magnetic fields for underground cables calculated at 1m Above Ground Level (AGL), as seen in Table 17.3 below.

Table 17.3 - Magnetic Fields for direct buried underground cables at 1m AGL

Voltage	Specifics	Location	Load	Magnetic Field in μT at Distance from Centreline			
				0m	5m	10m	20m
400kV	Direct Buried	0.5m spacing, 0.9m depth	Maximum	96.17	13.05	3.58	0.92
			Typical	24.06	3.26	0.90	0.23

- 17.3.29 The ICNIRP guidelines for occupational exposure at 500 μT and for public exposure 100 μT . Table 17.3 demonstrates that even directly above the cable under the maximum load, neither the occupational nor public limits will be breached.
- 17.3.30 Underground cables do not produce any external electric fields.
- 17.3.31 The 400kV cable system is as discussed a short length of less than 1km to the existing substation at the West Burton Power Station site, adjacent to the north of the Site. The nearest residential receptor is located more than 100m from the likely route of the underground cable (bearing in mind that the PoC is adjacent to the north / north-east of the Site, within the existing West Burton Power Station site). Due to the magnitude of effect upon the receptors, in accordance with ICNIRP exposure limit values set out in Table 17.3, EMFs will have no effect on local residents and is therefore **not significant**.

Mitigation and Enhancement

- 17.3.32 The requirement to consider EMF exposure guidance is fully understood by the Applicant and has been factored into the consideration of the route alignment within the Site from an early stage.
- 17.3.33 No specific mitigation measures are considered necessary, given the distance of potential residential receptors to the short cable route that will connect the Proposed Development to the existing substation at the West Burton Power Station site. The final route alignment and design of the electrical infrastructure will consider the measures required to ensure compliance with the Electricity Safety, Quality and Continuity Regulations 2002, and any new advice that may emerge from the Department of Health relating to Government policy for EMF exposure guidelines.
- 17.3.34 It has been shown that the relevant electrical infrastructure will comply with the current public exposure guidelines.

Residual Effects

- 17.3.35 No significant EMF effects are anticipated until the Proposed Development is operational and generating electricity. EMFs, specific to the 400kV underground cable route, (as the only relevant infrastructure to be assessed), are demonstrated through the assessment work not to produce EMF exposure above public and occupational guidelines. Therefore, it is anticipated that there would be **no significant residual effect** on EMF from the Proposed Development.

Cumulative Effects and In-Combination Effects

Cumulative Effects

- 17.3.36 The shortlist of cumulative sites for this DCO application are predominantly large-scale infrastructure developments, primarily solar farms and battery storage applications. Some of the shortlisted solar cumulative sites may also be connecting into West Burton Substation with underground cabling. Each scheme will have its own cable route connection into West Burton Substation with easements and protective provisions in place, including West Burton Solar Project (EN010132). The Site is void of development in a generally linear corridor running in a broadly south-west to north-east alignment through the eastern half of the Site, to allow for the easement of West Burton Solar Project (EN010132). Therefore, no interaction with cabling associated with the Proposed Development is anticipated to interact with other cumulative sites cabling to cause significant EMF effects. As such this does not require any further level of assessment, and there are **no significant cumulative effects** anticipated.
- 17.3.37 As set out in the 'Assessment Methodology' section of this Chapter, magnetic fields are not added together where they may be present from multiple sources, therefore there will be no significant cumulative effects with other developments.

In-Combination Effects

- 17.3.38 As no significant effects are anticipated in regard to EMF's, it is not considered any significant in- combination effects with other environmental topics would be produced.

17.4 Telecommunications and Utilities

17.4.1 This section assesses the effects of the Proposed Development on telecommunication infrastructure and existing utilities.

17.4.2 The Proposed Development has the potential to affect the existing telecommunications and utility infrastructure below ground.

Policy Context

17.4.3 Effects relating to existing infrastructure are not environmental effects and there is no requirement to include an assessment of these effects under the EIA Regulations. However, given the nature of the Proposed Development, they have the potential to affect existing infrastructure above and below ground.

Assessment Methodology

17.4.4 Telecommunications providers are unlikely to be affected by Electromagnetic Interference (EMI) unless transmitters are near electrical infrastructure associated with the solar PV array, in particular inverters⁷.

17.4.5 A desk-based search has been undertaken for the presence of telecommunications, and utilities infrastructure within the Site and its vicinity and is provided at **Appendix 17.1 – Utilities Report (parts 1-7) [EN010163/APP/6.3.17]** of this ES. A qualitative approach is used to assess the likelihood of significant effects on telecommunications and utilities.

Baseline Conditions

Telecommunications

17.4.6 It is understood that three existing telecommunications assets are located within the Site, under the ownership of:

- Openreach (British Telecommunications plc);
- Vodafone; and
- National Grid.

⁷ Pager Power (2014) News: Electrical Compatibility: solar farms and wireless transmissions

Television Reception

- 17.4.7 The area surrounding the Proposed Development receives television signals that were made exclusively digital after the digital switchover was completed in the Nottinghamshire region in 2011⁸.
- 17.4.8 The area within and surrounding the Site is predominantly served by the Belmont transmitter⁹ (Lincolnshire), which is located approximately 39km to the east of the Site.
- 17.4.9 Additional searches were undertaken for the presence of radio masts within the vicinity of the Site, which found:
- Fishpond Hill (Nottinghamshire, England) DAB transmitter, located 36km to the south-west; and
 - Belmont (Lincolnshire, England) DAB transmitter located 39km to the east.

Utilities

- 17.4.10 On-site utilities include water, sewers, a high-pressure gas pipeline and electrical cables. Knowledge of the utilities during design and construction allows any effects to be negated by avoiding them or by use of stable structures, such as pipe bridges.
- 17.4.11 Statutory undertakers including Cadent Gas Limited, Anglian Water, National Grid, Network Rail and the Environment Agency, have been informed and consulted with regard to the Proposed Development. Further details on those consulted are set out within the **Consultation Report [EN010163/APP/5.1]**.
- 17.4.12 Through consultation and a desk-based search of existing datasets, the following utilities and infrastructure that have the potential to be affected by the Proposed Development have been identified:
- Potable, and decommissioned high pressure water lines owned by Anglian Water;
 - A Medium Pressure gas line passing through Sturton le Steeple owned by Cadent Gas;
 - Flood defences at the River Trent;
 - Exolum high pressure pipeline system;

⁸ UK Digital Switchover Explained: <https://www.frequencycast.co.uk/godigital.html>

⁹ Full service- Freeview Transmitters: <https://ukfree.tv/maps/freeview>

- National Grid Electricity Distribution Networks;
- National Grid Electricity Transmission Networks;
- Network Rail High Pressure Water Pipelines;
- Network Rail Electricity Cables;
- Roads managed by NCC as the Local Highways Authority (LHA);
- British Telecommunications (BT) apparatus;
- Severn Trent Water apparatus (i.e., lateral drains, foul water and surface water); and
- Vodafone apparatus.

17.4.13 The utilities present within the Order Limits are shown on **Figure 17.2 – Utilities Plan [EN010163/APP/6.4.17]**.

Assessment of Likely Significant Effects

Telecommunications – Construction, Operational and Decommissioning Phases

17.4.14 Telecommunications infrastructure has been identified within the Site. The design of the Proposed Development will retain the required offsets (with regard to existing telecommunications and utilities on the Site, to provide clear access and to minimise the potential for conflicts, such as damage from piling, excavation, or compaction.

17.4.15 Trenching and horizontal directional drilling activities to lay new infrastructure associated with the Proposed Development will take account of the number of telecommunications and utilities services that may interact with undergrounded cabling comprising the Proposed Development.

Television Reception – Construction, Operational and Decommissioning Phases

17.4.16 The Proposed Development comprises fixed low-lying infrastructure and is therefore unlikely to interfere with digital television signals. **No significant effects** are anticipated during the construction, operation and decommissioning phases.

Utilities – Construction and Decommissioning Phases

17.4.17 The potential exists for utilities to be affected during the construction of the Proposed Development through damage caused as a result of excavation and engineering operations.

- 17.4.18 For workers working in the immediate vicinity of a gas or high voltage electricity utility asset, the potential impacts are physical injury or death as a result of a utility strike. For communities dependent on the utility assets, the potential impact is the disruption to services provided by the assets.
- 17.4.19 Prior to the construction and decommissioning phases, the design team and appointed Contractor will review the locations and alignments of the utilities using utilities plans and use them to inform the plans for the proposed works to ensure all known utilities are avoided.
- 17.4.20 Without any precautionary measures to avoid damage to utilities, this could lead to a short-term adverse effect. However, such risks will be minimised by:
- locating the Proposed Development outside of utilities' protected zones,
 - the use of ground penetrating radar before excavation to identify any unknown utilities;
 - consultation and agreement of construction/ demobilisation methods prior to works commencing; and
 - Good construction working practices to manage the risk to any minor utilities which are not mapped by utilities companies.
- 17.4.21 These measures would reduce the likelihood of effects on utilities during construction and decommissioning.
- 17.4.22 A high-pressure gas pipeline bisects the eastern portion of the Site in a general north-to-east alignment. The design of the Proposed Development will seek to ensure that any buffers that the operator requests to be applied to the design are in place, including no solar panels or BESS infrastructure in this area.
- 17.4.23 Where high-voltage electricity cables are present, no Proposed Development infrastructure will be placed within a range of varying distances depending on the voltage of the cable and development component. Signage and height-restricted gates will be placed around high voltage power lines during construction to ensure that all construction vehicles adhere to the cable clearances.
- 17.4.24 The decommissioning phase would require below ground works to remove the on-site infrastructure; however, cables buried at a depth of over 0.9m will typically remain in situ. Works would be undertaken within the footprint excavated during construction. The embedded mitigation measures used during construction would

- also apply during decommissioning and therefore no adverse effects are predicted during decommissioning.
- 17.4.25 Engagement is also ongoing with all statutory undertakers with apparatus with the potential to be affected by the Proposed Development to agreement protective provisions that are included in the DCO.
- 17.4.26 **No significant effects** are therefore anticipated in regard to utilities during the construction and decommissioning phases.

Utilities – Operational Phase

- 17.4.27 The potential exists for utilities to be affected during the operation of the Proposed Development through damage caused as a result of maintenance operations. However, effects are expected to be a lesser degree than the construction and decommissioning stages than the operational phase of the Proposed Development because no below ground works will be required during operation.
- 17.4.28 As the design of the Proposed Development has located components outside utilities' protected zones with easements in place, there should be no interference with onsite utilities. The operators will run their own maintenance programme which will include their own Health and Safety programme and procedures to implement.
- 17.4.29 Through careful design consideration of the Proposed Development, and operators following implemented site management and Health and Safety procedures, the risk of impact is considered unlikely and **not significant**.

Mitigation and Enhancement

- 17.4.30 The risk to existing utilities on the Site during the construction and decommissioning phases would be minimised, as the design of the Proposed Development will incorporate any offset distances from existing utilities, agreed with the relevant stakeholders.
- 17.4.31 The principles in the **Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4])** and the **Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4])** of this ES will be implemented on the Site prior to any construction taking place, which will further reduce the likelihood of significant effects, and are secured by Requirements in the DCO.
- 17.4.32 No further mitigation is considered to be required.

Residual Effects

- 17.4.33 During the construction, operational and decommissioning phase no significant effects on telecommunication or television reception are likely as the infrastructure is neither present within the Site nor in close proximity to it, and the nature and scale of the infrastructure comprising the Proposed Development will not cause any effects. Embedded mitigation measures will minimise risk of damage to utilities during construction and decommissioning.
- 17.4.34 No effects on utilities are predicted as a result of the Proposed Development because no below ground works will be required during operation. Embedded mitigation through the design of the Proposed Development has ensured no interaction with buried and overhead utilities, with easements in place.
- 17.4.35 Therefore, it is anticipated that there would be **no significant residual effect** on telecommunications, television reception and utilities from the Proposed Development.

Cumulative Effects and In-Combination Effects

Cumulative Effects

- 17.4.36 Cumulative effects are not anticipated to occur in combination with other cumulative schemes in the locality, as the Proposed Development is not considered likely to result in any adverse effects on telecommunication, television or utilities.
- 17.4.37 Other solar cumulative schemes in the locality of the Site are not anticipated to have any adverse effects on telecommunications and television reception as it is anticipated all schemes would have no effect on telecommunications and television reception in isolation and would adhere to similar mitigation measures set out above, to mitigate their own effects. **No significant cumulative effects** are anticipated.

In-Combination Effects

- 17.4.38 As no significant effects are anticipated in regard to telecommunication, television or utilities, it is not considered any significant in- combination effects with other environmental topics would be produced.

17.5 Waste

- 17.5.1 This section sets out the approach to waste management that will be applied to the design and the expected waste streams during each phase of the Proposed Development.
- 17.5.2 ‘Waste’ is defined as materials that are unwanted, having been left over after the completion of a process which would otherwise be discarded. The legal definition of waste also covers substances or objects, which fall outside of the commercial cycle or out of the chain of utility. In particular, most items that are sold or taken off site for recycling are wastes, as they require treatment before they can be resold or reused.
- 17.5.3 In practical terms, wastes include surplus spoil, scrap, recovered spills, unwanted surplus materials, packaging, office waste, wastewater, broken, worn-out, contaminated or otherwise spoiled plant, equipment and materials.
- 17.5.4 Waste minimisation is the process of reducing the quantity of such materials arising, requiring processing and/or disposal.
- 17.5.5 The priority at the Site will be to not produce waste in the first instance. Therefore, the implications pertaining to waste associated with the Proposed Development are being considered at the earliest stage.

Policy Context

- 17.5.6 The Overarching National Policy Statement for Energy (EN-1)¹⁰ considers resource and waste management at section 5.15. NPS EN-1 notes: “...where possible applicants are encouraged to source materials from recycled or reused sources and use low carbon materials, sustainable sources and local suppliers.” Furthermore, applicants are “...encouraged to use construction best practices in relation to storing materials to prevent waste... The use of Building Information Management tools to record the materials used on construction can help to reduce waste during the decommissioning phase.”
- 17.5.7 The waste hierarchy is noted at paragraph 5.15.2 of NPS EN-1 and shown below at Figure 17.1.

¹⁰ Department for Energy Security and Net Zero (2023) Overarching National Policy Statement for Energy (EN-1) [online] available

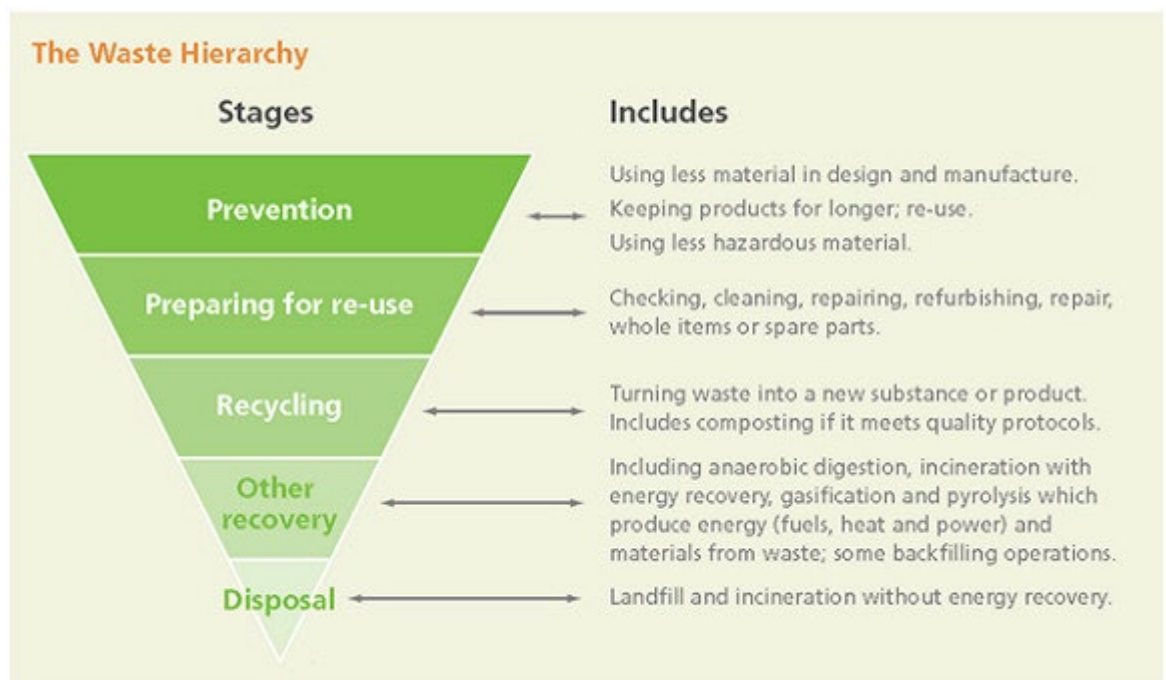


Figure 17.1 – The Waste Hierarchy

- 17.5.8 The Waste Framework Directive (WFD) 2008¹¹ is the legislative framework for the collection, transport, recovery and disposal of waste across the European community.
- 17.5.9 Schedule 1 of the Waste (England and Wales) Regulations 2011¹² translates the provisions of the WFD into legislation and require waste prevention programmes and waste management plans that apply the 'Waste Hierarchy' to guide the principle to sustainable waste management.
- 17.5.10 The Waste Management Plan for England (WMPE)¹³ is a high-level strategy that supersedes the former Waste Strategy 2013 and supports the implementation of the objectives and provisions set out within the revised Waste Framework Directive, specifically Article 28 which requires that Member States must establish one or more waste management plans covering their territory.
- 17.5.11 The Waste (England and Wales) Regulations 2011 require that everyone involved in waste shall take all reasonable measures to apply the waste hierarchy except where, for specific waste streams, departing from the hierarchy is justified.

¹¹ Directive 2008/98/EC

¹² UK Statutory Instruments (2011) The Waste (England and Wales) Regulations 2011 [online] available

¹³ Department for Environment, Food and Rural Affairs (2021) Waste Management Plan for England [online] available

- 17.5.12 At local level, 'Saved' Policies of the Nottinghamshire and Nottingham Waste Local Plan (2002) and Waste Core Strategy (2013) provide the policy context in respect of waste management. Local Plan 'saved' policies are partly replaced by the Core Strategy. 'Saved' policies relate to proposals for waste management and associated facilities – they are not considered explicitly relevant in the context of the Proposed Development. Waste Core Strategy sets out the approach on delivering sustainable waste management in Nottinghamshire and Nottingham until 2031. It also sets out strategic policy as well as criteria on the location and types of facilities that are needed. Again, the Core Strategy is not explicitly relevant in the context of the Proposed Development.
- 17.5.13 A new waste plan is currently being prepared that, once adopted, will replace both the Local Plan 'Saved' Policies and the Core Strategy. To date, the Councils have proposed modifications to the Waste Local Plan following the hearing sessions in October 2024, without prejudice to the Inspector's final conclusions on the Plan which will consider representations made. The modifications consist of Main Modifications, which are deemed to materially affect the Plan, and Additional Modifications, which correct minor errors or provide further clarification. Both Councils have recently held a public consultation on the proposed Main Modifications to the Pre-Submission Draft Waste Local Plan. As the Main Modifications are deemed to materially alter the Plan, these modifications have been subject to further Sustainability Appraisal and Habitats Regulation Assessment. The responses received are currently under consideration as the plan is still within an examination period that has not been completed. Emerging policies in the new waste plan and not considered relevant in the context of the Proposed Development.

Assessment Methodology

- 17.5.14 The following guidance informs the assessment: IEMA Guide to Materials and Waste in Environmental Impact Assessment 2020¹⁴ (the 'IEMA Guidance').
- 17.5.15 There are two approaches to assess effects of waste, 'Void Capacity' and 'Landfill Diversion' within the IEMA Guidance. Void Capacity assesses the percentage of the remaining "space or void" within landfill capacity that will be used by waste produced during the construction and/operation phases of the development. Decommissioning waste is not assessed in the guidance. Appreciable quantities of

¹⁴ IEMA (2020) Guidance: Guide to Materials and Waste in Environmental Impact Assessment

waste are not expected to be generated unless major replacement works are required. It is likely that these would occur in the later stages of the operational life of the Proposed Development (i.e., over 20 years) and therefore the 'Void Capacity' approach was not applicable to adopt. There is no realistic way of anticipating what waste management capacity will be available in 20+ years' time, particularly, for some specialist waste that may be generated by the Proposed Development.

- 17.5.16 An alternative approach under the IEMA guidance is to compare the expected landfill diversion rate against the following criteria.

Table 17.4 – Landfill Diversion Criteria

Effect	Landfill Diversion Rate
No change	100% landfill diversion rate
Negligible	90-99% landfill diversion
Minor	60-89% landfill diversion
Moderate	30-59% landfill diversion
Major	<30% landfill diversion

- 17.5.17 The assessment of the effects of the waste generation associated with the Proposed Development has been undertaken in line with the 'Landfill Diversion' approach within the IEMA Guidance
- 17.5.18 Waste streams and quantities have been estimated using industry standards, based on activities, material requirements and staff requirements during the construction, operation, and decommissioning phases.
- 17.5.19 The study area has been defined in line with the IEMA Guidance as primary study area is based on the Order Limits; constituting the area within which waste would be generated.

Baseline Conditions

- 17.5.20 Waste at the Site is currently associated with agricultural practice. Potential waste streams currently include left over crop and straw bales, fertiliser sacks and chemical containers.
- 17.5.21 During construction, agricultural uses will cease within the main development areas. The Biodiversity Mitigation Areas, as illustrated on **Figure 2.1- Indicative Site**

Layout [EN010163/APP/6.4.2], will be retained and could continue for agricultural use.

Assessment of Likely Significant Effects

Construction Phase

- 17.5.22 The Order Limits is primarily agricultural land; therefore, no demolition waste will be produced as part of the Proposed Development. It is also anticipated that minimal site preparation and excavation waste would be generated given the baseline. The underground cabling runs through both agricultural land and roads, which are likely to generate minimal arisings from activities, and would be reused onsite as cable route cover.
- 17.5.23 All the electrical infrastructure such as solar PV modules, inverters, transformers, batteries and other supporting infrastructure will be manufactured offsite and delivered to the Order Limits ready for installation. Therefore, construction and assembly waste is expected to be minimal, including packaging wastes (wood and plastics), fencing (metal and wood), Waste Electrical and Electronic Equipment (WEEE) wastes and concrete.
- 17.5.24 Waste materials can be generated during the Site preparation stage of construction and during the installation of infrastructure and erection of built form.
- 17.5.25 The exact quantities and types of waste likely to be generated by the construction phases are unknown; however, it is expected that waste streams could include:
- Welfare facility waste;
 - Waste chemicals, fuels and oils;
 - Waste metals (iron and steel);
 - Waste water from dewatering of excavations;
 - Waste water from cleaning activities (e.g., wheel wash);
 - Packaging; and
 - General construction waste (paper, cardboard, wood, etc.).
- 17.5.26 The destinations of the above potential waste streams would be (where applicable) through recycling plants. Landfill sites for construction and demolition wastes and landfill for hazardous waste would be used as a last resort. The generation of construction-related waste can be significantly reduced through the choice of

materials and other opportunities pre-construction phase will be explored as far as possible.

17.5.27 Anticipated waste streams and destinations during construction could be:

Table 17.5 – Construction Waste Streams and Destinations

Waste Stream	Destination
Cardboard	Authorised recycling, worse case landfill
Wood	Authorised recycling, worse case landfill
Plastic	Authorised recycling, worse case landfill
Metal	Authorised recycling, worse case landfill
Paint and solvents	Authorised recycling, worse case landfill
Chemical Containers	Authorised recycling, worse case landfill

17.5.28 Construction activities will also generate waste materials as a result of general handling, losses and surpluses and these wastes can be mitigated through good site practices, including proper storage and handling of materials to avoid damage, and accurate quantity estimates and efficient purchasing arrangements to avoid over ordering.

17.5.29 The main anticipated construction waste stream are all capable of being recycled, with recycling routes generally available for the materials. Therefore, the overall recovery rate and landfill diversion is expected to be at least 60-89% (minor), following a conservative approach, and therefore **not significant**.

Operational Phase

17.5.30 During the operational phase of the Proposed Development, any waste arising is anticipated to be substantially less than that of the construction phase.

17.5.31 Waste generation during the operational phase will include maintenance and replacement of proposed infrastructure including the solar PV modules, inverters, BESS and transformers. No replacement of cabling is anticipated during the proposed design life of the Proposed Development.

17.5.32 No permanent staff are expected to be on the Site during the operation of the Proposed Development; rather, there will be frequent visits made by off-site workers whose remit includes the Proposed Development, ensuring that it is

- maintained properly and remains operational. Waste arisings are expected to be minimal, and would include:
- Welfare facility waste;
 - Any equipment that needs replacing;
 - Waste materials; and
 - General waste (e.g., paper, cardboard, and wood).
- 17.5.33 This waste will be managed by permitted waste carriers who will visit the Proposed Development frequently for general waste removal; and infrequently for larger items, such as equipment.
- 17.5.34 Should equipment fail and need replacing, it is anticipated that the associated part would be returned to the manufacturer if still under warranty for refurbishment if possible or recycled if facilities allow. Like all electrical equipment, producers have legal obligations under the Waste Electrical and Electronic Equipment Directive legislation. Solar panels contain aluminium which can be recycled, and the remaining glass and silicon mix can be ground up into other building materials and industrial applications. It is known that materials arising from solar panels can be reused for produced new solar panels¹⁵. Solar PV modules are made of a frame (typically aluminium), glass, crystalline silicon solar cells and copper wiring, of which between 90 - 99% can be recycle. The electrical infrastructure, should it need replacing is also likely to be recycled.
- 17.5.35 Possibilities to re-use or recycle materials will be explored before resorting to landfill options in line with the Nottinghamshire and Nottingham Replacement Waste Local Plan Part 1 Waste Core Strategy (adopted December 2013) which seeks to improve reuse and recycling rates, in alignment with the Waste Management Plan for England 2021. There is a new industry emerging for recycling solar PV modules. This would be explored, in addition to the resale of any operational panels.
- 17.5.36 As detailed in the decommissioning phase, the main elements of the Proposed Development (solar PV modules, PV module mounting structure, onsite cabling, BESS, inverters, transformers, switchgear and on-site substation) are all capable of being recycled, with recycling routes generally available for the materials.

¹⁵ GreenMatch, The Opportunities of Solar Panel Recycling [online] available

- Therefore, the overall recovery rate and landfill diversion is expected to be at least 60-89% (minor), following a conservative approach, and therefore not significant.
- 17.5.37 The operational phase effects associated with waste are anticipated to be **not significant**. Waste generated during operation will be appropriately managed in accordance with all relevant legislation.
- Decommissioning Phase**
- 17.5.38 During the decommissioning phase, it is expected that a number of waste streams will be created. These are likely to include the following:
- Solar panels and mounting structures;
 - Waste materials from foundations;
 - Electrical equipment;
 - Energy storage i.e., batteries;
 - Cables;
 - Welfare facility waste;
 - Waste chemicals, fuels and oils;
 - Waste metals;
 - Waste water from dewatering of excavations; and
 - Wastewater from cleaning activities (e.g. wheel wash).
- 17.5.39 Reinstatement of the Order Limits to its original use is anticipated as far as possible and practicable. Any requirements to leave certain infrastructure, for example access tracks, would be discussed and agreed with landowners as part of the decommissioning process.
- 17.5.40 As the Proposed Development seeks to convert solar radiation into electricity, there will not be any hazardous waste created on the Site (resulting in no requirement for an environmental remediation strategy).
- 17.5.41 Anticipated waste streams and destinations during decommissioning could be:

Table 17.6 – Decommissioning Waste Streams and Destinations

Waste Stream	Destination
Solar Panels	Authorised recycling, worse case landfill
Concrete or foundation structures – could be covered by Metal also	Authorised recycling, worse case landfill
Hardcore or material used for tracks	Authorised recycling, worse case landfill
Electrical equipment	Authorised recycling
Metal	Authorised recycling
Welfare facility waste	Authorised recycling, worse case landfill

- 17.5.42 The PV modules will be recycled or reused, where possible. With regards to the supporting structures, the structures will be unscrewed/unbolted and then removed from the ground using a piling machine. Once the supporting structures have been removed, they will either be re-used or recycled, where possible. Only a small amount of backfilling will be required to fill the holes of the supporting structures.
- 17.5.43 Other associated infrastructure, such as the inverters will be removed from their concrete foundations and will be transported via HGVs off site. The equipment will either be re-used or recycled, where possible.
- 17.5.44 The inverter platforms and concrete foundations will be broken up and removed off site. The crushed foundations will be provided to a licensed waste transfer station for appropriate disposal or solar as recycled aggregate. Any uneven ground will be reinstated to its former condition.
- 17.5.45 The customer switchgear containers do not have foundations and, therefore, will simply be transported off the Site. The containers will be re-used or recycled, where possible.
- 17.5.46 Some tracks may be restored to the previous condition. In those cases, the aggregate used for the internal tracks will be recovered, loaded onto HGVs and transported off site for re-use at another construction site or to a recycling facility.

- 17.5.47 Underground cables will be disconnected from the local electricity network to be capped off and left in situ.
- 17.5.48 The Applicant is dedicated to ensuring that, where possible, as much of the equipment proposed is either re-used or recycled. As such, the quantum of non-recyclable waste will be limited.
- 17.5.49 Recycling of all materials after end use will include panels (which are covered by the Waste Electrical and Electronic Equipment Directive¹⁶), screws, mounting frames and wiring. Any non-recyclable waste will be stored in a skip for regular removal to an appropriate landfill.
- 17.5.50 Restoring the Site will involve some minor ground works. Any residual soil which cannot be accommodated on site, will be removed and disposed of at an appropriate landfill or sold to a landowner needing additional soil. However, this is not expected to be required due to the size of the Site.
- 17.5.51 All waste transported off the Site will be delivered to the appropriately licenced receivers of such materials. Operators receiving any waste materials resulting from the Proposed Development will be subject to their own consenting procedures. It is worth noting that it is not possible to forecast the capacity of the landfill sites for decommissioning at this stage due to potential change in waste generation and operators at that time.
- 17.5.52 Therefore, the main anticipated decommissioning waste stream are all capable of being recycled, with recycling routes generally available for the materials. Therefore, the overall recovery rate and landfill diversion is expected to be at least 60-89% (minor), following a conservative approach, and therefore **not significant**.

Mitigation and Enhancement

- 17.5.53 Waste arisings will be prevented and designed out where possible. Opportunities to re-use material resources will be sought where practicable. Where re-use and prevention are not possible, waste arisings will be managed in line with the Waste Hierarchy.
- 17.5.54 Design considerations will seek to minimise waste from the construction phase and are likely to follow these approaches:

¹⁶ Office for Product Safety and Standards (2018) Waste Electrical and Electronic Equipment (WEEE) Regulations [online] available

- Maximise the use of reclaimed materials during construction;
 - Maximise recycling opportunities in the decommissioning phase (further details below);
 - Use prefabricated and standardised components in the standard product sizes (e.g., panels, mounting structures). As these are made in a factory-controlled environment, they tend to generate less waste and if standard product sizes are made use of, this minimises wastage on site;
 - Segregation of construction waste on site to maximise potential for reuse/recycling;
 - Use of suppliers who collect and reuse/recycle packaging materials;
 - The off-site separation and recycling of materials where on site separation is not possible; and
 - Training of contractors in waste minimisation and materials reuse.
- 17.5.55 Toxic and/or hazardous waste must be treated by a licensed operator. The transportation of such waste will also require a licensed haulier. Materials are to be dealt with in accordance with the **Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4])**, which will be secured through a DCO Requirement. With these in place and the appropriate control measures followed, no significant effects are anticipated.
- 17.5.56 Re-useable waste includes soil excavated from trenches, roads, compound areas and foundations. Soils are an important resource, and to minimise effects to this resource, an **Outline Soil Management Plan (Appendix 15.2, [EN010163/APP/6.3.15])** will be implemented on the Site and will comprise the best practice for soil handling on the Site.
- 17.5.57 To avoid wastage, with reference to DEFRA's Soil Strategy (2009)¹⁷, stripped soils will be stored in separate resource bunds no more than 3m high, and kept grassed and free from construction traffic, to ensure that the soil can be re-used elsewhere on the Site.
- 17.5.58 The primary measures to mitigate against the loss of soil resources will be to reuse as much of the surplus resources on-site and to dispose of any surplus soils thereafter in a sustainable manner (i.e., as close to the Proposed Development as

- possible and to an after-use appropriate to the soil's quality). However, surplus resources requiring removal off site are not expected.
- 17.5.59 There may be a need to remove some soils from the Order Limits for treatment or disposal, if found to be contaminated and if it is not practical to treat this onsite. This would be overseen by a soil advisor specialist as outlined in the **Outline Soil Management Plan (Appendix 15.2, [EN010163/APP/6.3.15])**.
- 17.5.60 All waste transported off the Site will be delivered to the appropriately licenced receivers of such materials. Operators receiving any waste materials resulting from the Proposed Development will be subject to their own consenting procedures.
- 17.5.61 The **Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4])** and the **Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4])** include measures such as the avoidance of overordering, and the maximisation of re-use and recycling (where feasible)), and will be implemented on the Site prior to any construction works taking place. The preparation of detailed management plans are secured by way of DCO requirement.
- 17.5.62 Similar measures would be included for the decommissioning phase of the Proposed Development in the **Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4])**.

Residual Effects

- 17.5.63 During construction, operation, and decommissioning, the re-use or recycling of materials will be explored before resorting to landfill options. Waste during the construction, operation and decommissioning phase will be dealt with as part of the **Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4])** and the **Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4])**, which is prepared in line with relevant legislation and guidance. Therefore, it is anticipated that there would be **no significant residual effects** on waste from the Proposed Development.

Cumulative Effects and In-Combination Effects

Cumulative Effects

- 17.5.64 There are a number of potential other development that, depending on construction dates, may have cumulative effects with the Proposed Development. With regard to waste, there may therefore be cumulative volumes of waste

- associated with energy generation and decommissioning. This could create pressure on the capacity of local recycling plants or landfill sites.
- 17.5.65 A new industry is emerging for the recycling of solar panels, and the resale of any operational panels. These streams could be explored during the decommissioning phase of the Proposed Development, as technology is assumed to have advanced at the end of the Proposed Development's operational life.
- 17.5.66 Management of the potential cumulative volumes of waste would be managed through the final CEMP and Decommissioning Plan, produced at the detailed design stage. Consultation with waste management providers would be undertaken to ensure that waste can be accommodated.

In-Combination Effects

- 17.5.67 As no significant effects are anticipated in regard to waste, it is not considered any significant in-combination effects with other environmental topics would be produced.

17.6 Major Accidents and Disasters

- 17.6.1 This section summarises the potential effects of the Proposed Development on the risks of major accidents or disasters occurring.
- 17.6.2 ‘Accidents’ are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g., major emission, fire or explosion).
- 17.6.3 ‘Disasters’ are naturally occurring extreme weather events or ground related hazard events (e.g., subsidence, landslide, earthquake).

Policy and Guidance Context

- 17.6.4 The EIA Regulations cite two specific directives as examples of types of risk assessments to be considered as part of an EIA. These are the Directive 2012/18/EU of the European Parliament and of the European Council¹⁸ (which deals with major accident hazard registered sites) and the Council Directive 2009/71/Euratom¹⁹ (which deals with nuclear sites). Neither of these Directives are relevant to the Proposed Development.
- 17.6.5 Topic specific guidance ‘Major Accidents and Disasters in EIA: A Primer (IEMA, 2020)²⁰’ is also relied upon. No set matrix approach scale is provided in the guidance, instead, factors are set out to be considered in the determination of significance through the expert judgement of the team.
- 17.6.6 The guiding factors to determine significance of effect include:
- the geographic extent of effects (effects beyond the development boundaries are more likely to be considered significant),
 - duration of effects (effects which are permanent (i.e. irreversible) or long-lasting are more likely to be considered significant),
 - severity of effects in terms of numbers,
 - degree of harm to those affected and the response effort required,
 - sensitivity of the identified receptors, and

¹⁸ OJEU (2012) Directive 2012/18/EU of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC.

¹⁹ OJEU (2009) Council Directive 2009/71/EURATOM of 25 June 2009 establishing a Community framework for the nuclear safety of nuclear installations.

²⁰ IEMA Guidance (2020) Major Accidents and Disasters in EIA: A Primer

- the effort required to restore the affected environment (effects requiring substantial clean-up or restoration efforts are more likely to be considered significant).

17.6.7 A further example is provided in the guidance that the “*significance threshold could be set at anything that causes the loss of life or permanent injury, and/or permanent or long-lasting damage to an environmental receptor.*” This significance assessment approach has been adopted and any identified major accidents and disaster risks deemed requiring further assessment in this Chapter are assessed as significant if there is a high likelihood of loss of life or permanent injury, and/or permanent or long-lasting damage to an environmental receptor based upon professional judgement.

Assessment Methodology

17.6.8 In general, major accidents and disasters that are relevant to the Proposed Development fall into three categories:

- Events that could not realistically occur, due to the nature of the Proposed Development or its location;
- Events that could realistically occur, but for which the Proposed Development, and associated receptors, are no more vulnerable than any other development; and
- Events that could occur, and to which the Proposed Development is particularly vulnerable, or which the Proposed Development has a particular capacity to exacerbate.

17.6.9 An exercise has been undertaken to identify all potential major accidents and disasters that could be relevant to the Proposed Development and its location. Major accidents or disasters with little relevance in the UK were not included (take volcanic eruptions, for example). Table 17.7 below sets out the findings of this exercise.

Table 17.7: Potential Major Accidents and Disasters associated with the Proposed Development

Major Accident or Disaster	Potential Risk and Receptor	Relevant Chapter or Appendix of the ES ²¹
Health and Safety at Work	Risk of accidents for workers during the construction and decommissioning of the Proposed Development.	The Major Accidents and Disasters section of this chapter.
Floods	Risk of the Proposed Development flooding and its potential to exacerbate flooding to property and people in areas of increased flood risk.	Chapter 8: Hydrology, Hydrogeology, Flood Risk and Drainage [EN010163/APP/6.2.8] (
Fire within the Proposed Development	Risk of fire to relevant local residents, habitats and species, landscape features and waterbodies.	The Major Accidents and Disasters section of this chapter.
Road accidents	Risk posed by spillage of hazardous loads from road traffic accidents during construction/decommissioning on the environment. Risk from glint and glare to affect road users.	Chapter 8: Hydrology, Hydrogeology, Flood Risk and Drainage [EN010163/APP/6.2.8] Chapter 13: Transport and Access [EN010163/APP/6.2.13] Chapter 16: Glint and Glare [EN010163/APP/6.2.16]
Rail accidents	Risk of rail accident as a result of the cable route corridor crossing on rail users. Risk from glint and glare to affect train drivers.	The Major Accidents and Disasters section of this chapter. Chapter 16: Glint and Glare [EN010163/APP/6.2.16]
Aviation disasters	Risk from glint and glare to affect pilots and aircraft.	Chapter 16: Glint and Glare [EN010163/APP/6.2.16]
Flood defence failure	Risk of increased flooding from or flooding to the Proposed Development	Chapter 8: Hydrology, Hydrogeology, Flood Risk and Drainage [EN010163/APP/6.2.8]
Utilities failure (gas, electricity, water, sewage, oil, communications)	Risk of utilities failure to affect employees and local residents.	Telecommunications and Utilities section of this chapter.

²¹ Ongoing assessment work to be provided in ES chapters submitted as part of DCO application.

Major Accident or Disaster	Potential Risk and Receptor	Relevant Chapter or Appendix of the ES ²¹
Plant disease	<p>Biosecurity risks from invasive and non-native species.</p> <p>Biosecurity risks from new planting and habitat comprising the Proposed Development.</p>	Chapter 7: Ecology and Biodiversity [EN010163/APP/6.2.7]

Baseline Conditions

17.6.10 A number of receptors are present in the vicinity of the Proposed Development which could be vulnerable to major accidents or disasters, either because of their proximity to the Site or their importance to the surrounding area. These include:

- Villages, farms, and residential homes;
- Roads;
- Railways;
- Designated ecological sites, woodland, farmland, and waterbodies; and
- Underground infrastructure services including electricity, water, communications, and gas (this is assessed in the Telecommunications and Utilities section 17.4 of this Chapter).

Assessment of Likely Significant Effects

Construction and Decommissioning Phases

Health and Safety at Work

17.6.11 With regard to the NPSN-1, section 4.4, which acknowledges access to energy is clearly beneficial to society as a whole, the production, distribution, and use of energy may have negative impacts on some people's health. The policy requires the decision maker to consider potential effects of development proposals on human health, stating:

“where the proposed project has an effect on human beings, the ES should assess these effects for each element of the project, identifying any adverse health impacts, and identifying measures to avoid, reduce or compensate for these impacts as appropriate.”

17.6.12 There are various health and safety considerations particularly for workers during construction and decommissioning of the Proposed Development. As a result,

- workers are considered to be the most at-risk group. However, the risk to both construction workers and the general public is low and not significant during the construction and decommissioning phases.
- 17.6.13 Comprehensive health and safety assessments are an essential part of the construction process and would be carried out prior to construction by the contractor in accordance with legislation. A Construction, Design and Management (CDM) co-ordinator will be appointed responsible for the provision of a pre-construction information pack, as required under the Construction (Design and Management) Regulations 2015²². The appointed contractor will be required to provide a construction plan and will include measures such as the implementation of a risk management system on the Site.
- 17.6.14 The construction of the Proposed Development will be managed in accordance with the Health and Safety at Work Act 1974, and will comply with all other relevant Health and Safety Regulations, including:
- The Construction (Health, Safety and Welfare) Regulations, 1996²³;
 - Construction (Design and Management) Regulations 2015; and
 - Electricity Safety, Quality and Continuity Regulations 2002²⁴.
- 17.6.15 **No significant effects** are therefore anticipated.
- Design of the Equipment*
- 17.6.16 Health and Safety on the Site will be managed by the contractor during construction and decommissioning to mitigate the risk of equipment failure that could lead to a fire risk in line with legislative safety requirements.
- 17.6.17 The risk of fire from Battery Energy Storage Systems (BESS) is low, and to a lesser extent for workers during the construction and decommissioning phase than onsite employees during the operational phase, as the BESS will be containerised (known as ‘BESS Enclosures’), thus reducing the risk of damage to the energy storage which may cause fires.

²² Health and Safety Executive (2015) The Construction (Design and Management) Regulations 2015 [online] available at: <https://www.hse.gov.uk/construction/cdm/2015/index.htm> [last accessed 14th November 2024].

²³ UK Statutory Instruments (1996) The Construction (Health, Safety and Welfare) Regulations 1996 [online] available at: <https://www.legislation.gov.uk/ukSI/1996/1592/contents/made> [last accessed 14th November 2024].

²⁴ UK Statutory Instruments (2002) The Electricity Safety, Quality and Continuity Regulations 2002 [online] available at: <https://www.legislation.gov.uk/ukSI/2002/2665/contents> [last accessed 14th November 2024].

- 17.6.18 It is intended that after the maximum 40-year operational life of the solar panels, BESS and associated equipment will be removed from the Site, removing the risk of fire.
- 17.6.19 The risk of fire is small and is mitigated by the design of the equipment and the design of the Proposed Development. Therefore, the Proposed Development is not expected to have an effect on the risk of a major accident occurring as a fire during construction and decommissioning. **No significant effects** are anticipated.

Rail Accidents

- 17.6.20 The construction and decommissioning of the cable crossing the railway on the Site underground will be managed to the specific requirements of Network Rail and therefore the risk of a rail accident as a result of the crossing will be minimised. Therefore, **no significant effects** pertaining to rail accidents are anticipated. No significant effects are anticipated. Liaison with Network Rail is underway, and the Applicant expects to put in place Protective Provisions for the benefit of Network Rail.

Operational Phase

Health and Safety of Workers

- 17.6.21 The Proposed Development would operate to Health and Safety Executive “Health and safety in the new energy economy: Meeting the challenge of major change” published in August 2010²⁵.
- 17.6.22 Maintenance activities associated with the Proposed Development will be performed in accordance with relevant legislation. For example, any equipment required to be used (e.g., washing systems) will be appropriately handled, and employees will be trained. **No significant effects** are anticipated in this regard.
- 17.6.23 Traffic during the operational phase will consist of movements by staff that will supervise the operational and maintenance of the Proposed Development, and those that attend the sheep on the Site. This is unlikely to involve HGVs and is considered to be of negligible significance (see **Chapter 13: Transport and Access[EN010163/APP/6.213]**) for further details, and hence any related effects will be **not significant**.

²⁵ Health and Safety Executive (2010) Health and safety in the new energy economy

Design of the Equipment

- 17.6.24 When operational, the majority of the Proposed Development will comprise solar PV modules which are inert. Electrical infrastructure will be located across the Site, in the form of inverters, transformers and cabling, all of which will be the subject of routine maintenance such that it is not considered to pose a significant risk to creating an accident or disaster.
- 17.6.25 The Substation compound which will include transformers, and switchgear will be subject to routine maintenance such that it is not considered to pose a significant risk of creating an accident or disaster.
- 17.6.26 The Proposed Development has also been designed to include BESS. The BESS is located in the north of the Proposed Development, with an attenuation basin to the south designed to capture runoff from the BES Compound and Substation Compound areas, with storage provided for the 1 in 100 year plus climate change event (plus an additional volume for firefighting water for the BESS area). The BESS Compound will include batteries, inverters and system controllers.
- 17.6.27 There are potential operational hazards associated with BESS infrastructure such as a thermal runaway fire event in a BESS Enclosure due to electrical/battery fault, arson or lightning strike (result of severe weather), and separately if the BESS Enclosures are flooded due to severe weather it could lead to polluted runoff water.
- 17.6.28 Key receptors that could be affected are ecological receptors (flora and fauna), human receptors in the local area and emergency responders (including fire service staff).
- 17.6.29 Potential effects on these receptors in an uncontrolled fire would be temporary displacement of species caused by any smoke, with some potential abandonment of bird nests resulting in chick mortalities if a fire occurred during nesting season. However, large-scale mortality or morbidity is unlikely.
- 17.6.30 The buffer zones surrounding the BESS Enclosures (3m separation between pairs of BESS Enclosures) mean that there is no pathway for a fire to propagate to hedgerows or nearby woods and so no direct impacts due to fire are likely and as such, this risk event is unlikely to constitute a significant effect in relation to major accidents and disasters upon ecological receptors.
- 17.6.31 For human residential receptors, whilst smoke from an uncontrolled fire event would disperse to some extent over the >300m distances from BESS Enclosures to

- the receptors, there would still be odour impacts and potential minor health impacts on residents such as aggravation of pre-existing respiratory conditions. However, given that serious injuries or fatalities are unlikely to residents due to the large separation distances involved, this risk event (i.e. an uncontrolled fire in one BESS Enclosure) is unlikely to constitute a significant effect in relation to major accidents and disasters upon residential receptors.
- 17.6.32 For emergency response personnel, there is the possibility of loss of life and/or permanent injury from an uncontrolled fire in the event of an explosion whilst they are in close proximity to the BESS Enclosure: however, as the BESS Enclosures are designed to release such explosive pressure upwards via roof vent panels instead of horizontally, the possibility of loss of life and/or permanent injury to emergency responders is low. Again, due to the low risk of loss of life and/or permanent injury, an uncontrolled fire is unlikely to constitute a significant effect in relation to major accidents and disasters upon emergency responders.
- 17.6.33 The potential event in respect of severe weather and flooding is that heavy rain could result in surface water and/or fluvial flooding (in a breach scenario) resulting in the partial or full submersion of a BESS Enclosure in flood water. This may damage the BESS equipment but may also result in the pathway of contaminated flood water running off to nearby ecological receptors and/or local watercourses. The nature of any potential adverse effects at receptors would be morbidity or mortality of flora and fauna.
- 17.6.34 However, **Chapter 8 Hydrology, Hydrogeology and Flood Risk [EN010163/APP/6.2.8]** and the **Surface Water Drainage Strategy (Appendix 8.2, [EN010163/APP/6.3.8])** details management of surface water runoff, taking into account of the possibility of contaminated fire water runoff in the event of a fire. Key detail of mitigation measures include:
- As part of the Proposed Development, a leak detection system and alarm will be fitted to the cooling system, and the drainage strategy for the BESS area includes provision for the automatic retention of any contaminated fire-fighting runoff in the event of a fire;
 - A bund around the BESS area to prevent surface water from other areas entering the BESS area; and

- The attenuation basins have been designed to capture runoff from the BESS and substation areas, with storage provided for the 1 in 100 year plus climate change event (plus an additional volume for firefighting water for the BESS area). Runoff would be released to local drainage ditches at a controlled greenfield rate, with the option to shut off the outlet for the BESS in the event of a fire or other pollution incident. The attenuation basins in the BESS and substation areas will be lined to prevent infiltration.
- 17.6.35 The likelihood of a flooding event at the BESS Enclosures is therefore sufficiently low that it is unlikely to constitute a significant effect in relation to major accidents and disasters.
- 17.6.36 Any system installed will be strenuously tested during the factory and pre-commissioning testing regime before being given the final sign-off to energise. It noted that the majority of energy storage sites continue to operate without any problems which means that the risk is quite small.
- 17.6.37 The battery technology for the Proposed Development is anticipated to be lithium iron phosphate (LFP). LFP has better thermal stability and enters thermal runaway at higher temperatures compared to some other battery chemistries. 82 BESS Enclosures will form the BESS Compound of the Proposed Development.
- 17.6.38 There is a potential fire risk associated with certain types of batteries such as that set out above. The Site would be self-sufficient during a potential battery-based fire and would not require fire service intervention to prevent fire spread or any other significant risks to people or property.
- 17.6.39 Each BESS Enclosure forming part of the BESS Compound element of the Proposed Development will have a dedicated fire protection system, comprising flammable gas detection and venting, fire detection and alarm, and an automatic fire suppression system.
- 17.6.40 Further fire protection for battery technologies is outlined below:
- The manufacturer undertakes extensive testing and analysis to assess fire risk;
 - Do not install batteries where temperatures routinely approach or exceed 80°C – this is not the case at the Site;
 - Do not install batteries near heating equipment or heat sources – this is not the case at the Site;

- Protect the installation area from flooding, which may cause electrical fires – the risk of flooding is assessed in **Chapter 8 Hydrology, Hydrogeology and Flood Risk [EN010163/APP/6.2.8]** and the **Surface Water Drainage Strategy (Appendix 8.2, [EN010163/APP/6.3.8])** and mitigation measures to protect it from flooding have been recommended which will be developed as part of the detailed design; and
- Ensure that installation areas comply with the appropriate local fire, electrical and building code requirements – this would be the case with the Proposed Development.

17.6.41 The Proposed Development design will include 3m separation distances between pairs of BESS Enclosures to ensure that an isolated fire would not become widespread and lead to a major incident.

17.6.42 The risk of fire is small and therefore not likely to lead to any major accidents or disasters as this has been mitigated by the design of the equipment and the design of the Site, and therefore **no significant effects** are anticipated.

Rail Accidents

17.6.43 Cabling will cross the railway that traverses the western portion of the Site; cabling will be undergrounded. Trenchless techniques, such as Horizontal Directional Drilling, will be used to construct the crossing of the cable route; therefore, the works will be undertaken deep below the crossing and a distance either side, not interfering with the operations of the railway. The cable crossing will be designed to meet the specific requirements of Network Rail and therefore the risk of a rail accident in this regard as a result of the crossing will be minimised.

17.6.44 The ES **Chapter 17 Glint and Glare [EN010163/APP/6.2.17]** has included railway receptors into the assessment due to the potential effects of glint and glare from reflective surfaces when a development is located adjacent to a railway line (typically 50-100m from its infrastructure). Receptors were identified to meet this criteria (a section of the Network Rail Eastern Region – North and East Route (although noted not to be operational) and five trackside, two ground-mounted and two cantilever railway signals). With mitigation in place (screening along the boundary of the Proposed Development to obstruct views of potentially reflecting panels) the effects are negligible and not significant on railway receptors. See the ES **Chapter 17 Glint and Glare [EN010163/APP/6.2.17]** for full details on the assessment.

17.6.45 Therefore, **no significant effects** on rail accidents are anticipated.

Mitigation and Enhancement

17.6.46 The draft DCO also includes protective provisions for the protection of electronic communication networks, utilities and Network Rail and engagement with relevant statutory undertakers in this respect is ongoing.

17.6.47 Minimising the risk of major accidents during construction and decommissioning will be addressed through appropriate risk assessments as required in the **Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4])** and the **Outline Decommissioning Plan (Appendix 4.2, [EN010163/APP/6.3.4])** of this Environmental Statement. The implementation of those plans is secured via a requirement in the DCO.

17.6.48 The **Outline Fire Risk Management Plan (FRMP) (Appendix 4.4, [EN010163/APP/6.3.4])** has been produced for the Proposed Development and will be updated and maintained as a 'live document' throughout the operational phase of the Proposed Development, to reduce the risk of fire and propagation within the BESS Compound. Following this, the Fire Risk Management Plan (secured via DCO requirement) will be implemented on the Site prior to the operational phase, once detailed design

17.6.49 Once the system is commissioned, regardless of the technology used, the whole installation will be monitored continuously at a central hub where engineers and technology experts will ensure that it is operating optimally and safely 24 hours a day, 7 days a week.

17.6.50 The preventative measures included in the design of the BESS Compound and associated systems are such that an uncontrolled battery fire event is highly unlikely, and as such a significant effect upon the identified receptor from such is unlikely in relation to major accidents and disasters.

17.6.51 In regard to rail accidents, liaison with Network Rail is underway, and the Applicant expects to put in place Protective Provisions for the benefit of Network Rail.

Residual Effects

17.6.52 Given the nature of accidents and disasters, there is the potential for significant effects if an event does occur, however, the assessment has concluded that the risk of such events occurring is low for the Proposed Development, and **no significant residual effects** on the environment are therefore anticipated. On the rare occasion

- that a major accident and disaster does occur, the significance of the effect would correlate to the scale of the major accident and disaster event.
- 17.6.53 The focus is on prevention of major accidents and disasters, and mitigation if an event does occur. Taking into account the good industry practice and additional mitigation measures discussed above, the risk of accidents and disaster events at the Proposed Development is considered low. However, the assessment has concluded that the risk of such events occurring is low.

Cumulative Effects and In-Combination

Cumulative Effects

- 17.6.54 The shortlist of other development for the cumulative effects assessment for this DCO application (**Appendix 2.3- Cumulative Sites Long List and Short List [EN010163/APP/6.3.2]**) are all large-scale infrastructure developments, primarily of solar parks and battery storage applications. The majority of the shortlisted other developments are not located in proximity to the Site to have any notable inter-relationship of effects.
- 17.6.55 With regard to the adjacent Wood Lane Solar Farm development (BDC planning application reference 20/00117/FUL), there are no anticipated significant cumulative effects. The same Health and Safety restrictions will apply to the Proposed Development and the Wood Lanse Solar Farm Development, which would limit the exposure of receptors to significant risk.
- 17.6.56 The potential for cumulative effects, for example those pertaining to the construction phase of the Proposed Development in tandem with those schemes set out in **Chapter 2- EIA Methodology and Public Consultation [EN010163/APP/6.2.2]** of this ES are not anticipated to be significant.
- 17.6.57 Additionally, with the implementation of the **Outline Construction and Environmental Management Plan (Appendix 4.1, [EN010163/APP/6.3.4])** and the mitigation set out above to reduce the risk of fires, no significant effects are anticipated from the Proposed Development alone. For these reasons, it is concluded that **no significant cumulative effects** would arise.

In-Combination Effects

- 17.6.58 As no significant effects are anticipated in regard to major accidents and disasters, it is not considered any significant in-combination effects with other environmental topics would be produced.

Summary

- 17.6.59 As the above environmental topics have been scoped out of the ES as part of the **Appendix 1.1 - Steeple Renewables Project EIA Scoping Report [EN010163/APP/6.3.1]** and confirmed in the Planning Inspectorate Scoping Opinion (**Appendix 1.2 - EIA Scoping Opinion [EN010163/APP/6.3.1]**) these topics are not likely to cause significant effects and do not require a full chapter within the ES. Therefore, no summary table of significant effects, mitigation and residual effects is presented within this chapter.