



**POWER
FOR GOOD**

Chapter 17: Miscellaneous Issues

Preliminary Environmental Information Report

Volume 1

Steeple Renewables Project

Land at Sturton le Steeple, Nottinghamshire

17. Miscellaneous Issues

17.1 Introduction

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

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

- Electric, Magnetic and Electromagnetic Fields;
- Telecommunications and Utilities;
- Waste; and
- Major Accidents and Disasters.

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** 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 scoping responses and other consultation undertaken as detailed in Table 17.1 below.

Table 17.1: Consultation Responses

Scoping / Other Consultation	Issues Raised	Response / Action Taken
Planning Inspectorate		
Major Accidents and Disasters	<p><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></p>	<p>No standalone PEIR 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 final design has been developed, further detail will be provided in the ES and an accompanying Battery Safety Management Plan.</p>
Electromagnetic Fields (EMF)	<p><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></p>	<p>No standalone PEIR chapter is proposed to assess the impacts on EMF sources for the Proposed Development, but a section is included within this chapter assessing where relevant the cable systems above 132kV and have potential to cause EMF effects. Further details on this will also be provided in the subsequent ES.</p>
Waste	<p><i>“The ES should assess any impacts from off-site transport and disposal of waste generated during construction and decommissioning which are likely to result in significant effects. Any assumptions</i></p>	<p>No standalone PEIR chapter is proposed to assess Waste, but a section is included within this chapter. Further assessment work of the</p>

Scoping / Other Consultation	Issues Raised	Response / Action Taken
	<p><i>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>decommissioning phase, with regard to waste, will be assessed in the ES supporting the application for development consent.</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 PEIR chapter is proposed to assess Waste, but a section is included within this chapter. Further assessment work of the decommissioning phase, with regard to waste, will be assessed in the ES supporting the application for development consent.</p>
Lincolnshire County Council		
Waste	<p><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></p>	<p>No standalone PEIR chapter is proposed to assess Waste, but a section is included within this chapter. Further assessment work of the decommissioning phase, with regard to waste, will be assessed in the ES supporting the application for development consent.</p>

Scoping / Other Consultation	Issues Raised	Response / Action Taken
Health and Safety Executive		
Major Accidents and Disasters	<p><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></p> <p><u>Consideration of risk assessments</u></p> <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>HSE has no comment to make as there are no licensed explosives sites in the vicinity.</p> <p><u>Electrical Safety</u></p> <p>No comment from a planning perspective.</p>	<p>Details relating to consultation with West Burton A Power Station, and any future assessment (if required) will be set out within the subsequent ES.</p> <p>Further information on hazardous substance consent will be sought from BDC to accompany the DCO application. No further action required for explosive sites as none are within the vicinity of the Proposed Development.</p> <p>Electrical Safety is assessed within various sections of this PEIR Chapter.</p>

17.3 Electric, Magnetic and Electromagnetic Fields

Introduction

- 17.3.1 This section of the document 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 (EN-5)¹ requires an applicant to consider the following aspects, with regards to Electric and Magnetic Fields:

¹ Department for Energy Security and Net Zero (2023) National Policy Statement for Electricity Networks Infrastructure [online] available at: <https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5> [last accessed 13th November 2024].

- Compliance with Electricity Safety Quality and Continuity Regulations 2002 (ESQCR)²;
 - Health Protection Agency (HPA) guidance³; and
 - Optimal phasing of high voltage overhead power lines is introduced 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 (SI 2665/2002) 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 implementing appropriate measures for the protection of the public from EMF lies with the UK Government.

² 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 13th November 2024].

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 at: <https://www.hse.gov.uk/pubns/books/hsr25.htm> [last accessed 13th November 2024].

- 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 at: <https://assets.publishing.service.gov.uk/media/5a796799ed915d07d35b5397/1256-code-practice-emf-public-exp-guidelines.pdf> [last accessed 13th November 2024].

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 at: https://assets.publishing.service.gov.uk/media/5a7ce34440f0b65b3de0bc1f/powerlines_vcop_microshocks.pdf [last accessed 13th November 2024].

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 (μT) 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 (μT) 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.

17.4 Baseline Conditions

17.4.1 The underground grid connection 400 kV cable system will be located on private land 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 and residential areas.

17.4.2 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

17.4.3 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

17.4.4 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**.

17.4.5 The highest EMFs produced by underground cables are located directly above the buried cables, and field strength decreases with distance from the source.

17.4.6 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			Maximum	96.17	13.05	3.58	0.92

	Direct Buried	0.5m spacing, 0.9m depth	Typical	24.06	3.26	0.90	0.23
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17.4.7 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.

17.4.8 Underground cables do not produce any external electric fields.

17.4.9 The exact cable route is not known; however, it will be a relatively short length as the existing substation at the West Burton Power Station site is 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, EMFs will have no effect on local residents therefore the effect is not considered to be ‘significant’.

Mitigation Measures

17.4.10 The requirement to consider EMF exposure guidance is fully understood by the Applicant and has been factored into the consideration of the route alignment inside the Site from an early stage.

17.4.11 No specific mitigation measures are considered necessary, given the relatively 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.

17.4.12 It has been shown that the relevant electrical infrastructure will comply with the current public exposure guidelines.

17.5 Telecommunications and Utilities

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

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

Policy Context

17.5.3 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

17.5.4 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.

17.5.5 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 of this PEIR. A qualitative approach is used to assess the likelihood of significant effects on telecommunications and utilities.

17.5.6 The Utilities Report at Appendix 17.1 of this PEIR has used a different study area, when compared with the boundary of the Site shown at Figure 1.1. As such, areas that do not comprise the Site have been captured. The ‘Miscellaneous Issues’ chapter of the subsequent ES will combine Appendix 17.1 of this PEIR, and the areas of the Site that have not been captured within Appendix 17.1, to inform a worst-case assessment with respect to potential miscellaneous issues.

Baseline Conditions

Telecommunications

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

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

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

Television Reception

- 17.5.8 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.
- 17.5.9 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.
- 17.5.10 Additional searches were undertaken for the presence of radio masts within the vicinity of the Site:
- Fishpond Hill (Nottinghamshire, England) DAB transmitter, located 36km to the south-west; and
 - Belmont (Lincolnshire, England) DAB transmitter, located 39km to the east.

Utilities

- 17.5.11 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.
- 17.5.12 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 will be set out within the Consultation Report that will be submitted with the application for development consent.
- 17.5.13 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;

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

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

- Exolum high pressure pipeline system;
- National Grid Electricity Distribution Networks;
- National Grid Electricity Transmission Networks;
- DIO (MOD Abandoned Pipelines);
- 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; and
- Vodafone apparatus.

Assessment of Effects

Telecommunications – Construction, Operational and Decommissioning Phases

17.5.14 Telecommunications infrastructure has been identified within the Site. The design of the Proposed Development will retain the required offsets (to be agreed with the relevant providers) 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.

17.5.15 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.

17.5.16 In summary, consultation will inform agreed offset distances, which will be fed into the CEMP (secured via DCO requirement), seeking that construction work carried out is such that impacts on any services are minimised. Where direct conflict is anticipated, the crossing of utilities will be carried out in collaboration with the relevant utilities providers.

Television Reception – Construction, Operational and Decommissioning Phases

17.5.17 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

The potential exists for utilities to be affected during the construction and decommissioning phases of the Proposed Development, for example by damage caused resulting from excavation and engineering operations. In the absence of precautionary measures to avoid damage to utilities, a short-term adverse effect may arise. However, such risks will be minimised by:

- Mapping infrastructure that traverses the Site and avoiding any assets through the iterative design of the Proposed Development;
- The use of ground penetrating radar prior to any excavation to identify any unknown utilities; and
- Consultation and agreement of construction / demobilisation methods prior to works commencing. Protective provisions will also be in place for those statutory undertakers and included within the application for development consent.

17.5.18 The above measures, in addition to those that will form the future CEMP (and secured via DCO requirement) would reduce the likelihood of effects on utilities during construction and decommissioning. Therefore, no significant adverse effects are anticipated during the construction and decommissioning phases.

Utilities – Operational Phase

17.5.19 No effects on existing utilities are predicted as a result of the operational phase of the Proposed Development, as no below-ground works will be required during the operational phase. No significant effects are anticipated.

Mitigation Measures

17.5.20 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, to be agreed with the relevant stakeholders. Further, a CEMP will be implemented on the Site prior to any construction taking place, which will further reduce the likelihood of significant effects. No further mitigation is considered to be required.

Cumulative Effects

17.5.21 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.

- 17.5.22 Other solar cumulative schemes in the locality of the Site are not anticipated to have any adverse effects on telecommunications and television reception; all such 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.

17.6 Waste

- 17.6.1 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.
- 17.6.2 ‘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.
- 17.6.3 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.
- 17.6.4 Waste minimisation is the process of reducing the quantity of such materials arising, requiring processing and/or disposal.
- 17.6.5 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

- 17.6.6 The Overarching National Policy Statement for Energy (EN-1)¹⁰ considers resource and waste management at section 5.15. 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

¹⁰ Department for Energy Security and Net Zero (2023) Overarching National Policy Statement for Energy (EN-1) [online] available at: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1> [last accessed 13th November 2024].

materials used on construction can help to reduce waste during the decommissioning phase. The waste hierarchy is noted at paragraph 5.15.2 of EN-1 and shown below at Figure 18.1.

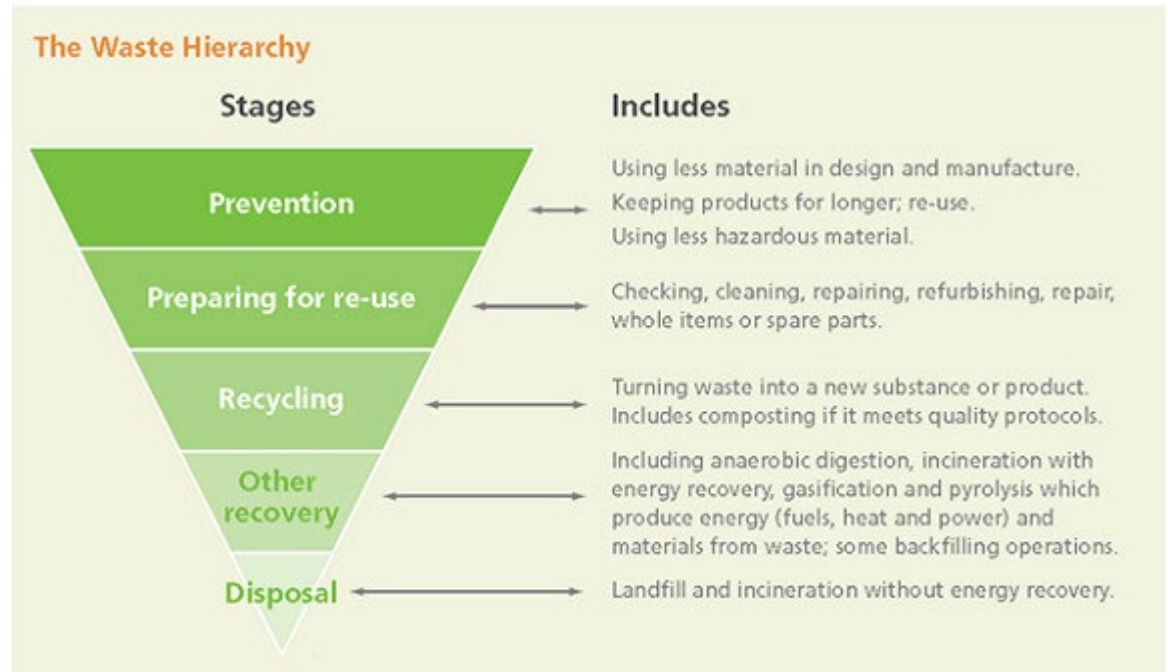


Figure 18.1 – The Waste Hierarchy

- 17.6.7 The Waste Framework Directive (WFD) 2008¹¹ is the legislative framework for the collection, transport, recovery and disposal of waste across the European community.
- 17.6.8 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.
- 17.6.9 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.

¹¹ Directive 2008/98/EC

¹² UK Statutory Instruments (2011) The Waste (England and Wales) Regulations 2011 [online] available at: <https://www.legislation.gov.uk/ukxi/2011/988/contents> [last accessed 14th November 2024].

¹³ Department for Environment, Food and Rural Affairs (2021) Waste Management Plan for England [online] available at: <https://assets.publishing.service.gov.uk/media/60103f71d3bf7f05bc42d294/waste-management-plan-for-england-2021.pdf> [last accessed 14th November 2024].

- 17.6.10 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.

Assessment Methodology

- 17.6.11 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.

Baseline Conditions

- 17.6.12 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.

Assessment of Effects

- 17.6.13 The nature of the Proposed Development and the known construction processes indicate that no significant quantities of waste are anticipated.
- 17.6.14 An Environmental Management Plan (EMP) will be prepared for the construction and decommissioning phases. These will include measures to control and manage waste on-site and will be secured through a DCO Requirement.

Construction Phase

- 17.6.15 Waste materials can be generated during the Site preparation stage of construction and during the installation of infrastructure and erection of built form.
- 17.6.16 The majority of construction equipment will be delivered to Site for assembly and installation (mounting structures) and connection (solar panels).
- 17.6.17 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., wheelwash);
 - Packaging; and
 - General construction waste (paper, cardboard, wood, etc.).

- 17.6.18 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.
- 17.6.19 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.
- 17.6.20 Design considerations will seek to minimise waste from the construction phase and are likely to follow these approaches:
- 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 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.
- 17.6.21 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 CEMP, which will be secured through a DCO Requirement. With these in place and the appropriate control measures followed, no significant effects are anticipated.

17.6.22 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, a CEMP (secured via DCO requirement) that includes a Soil Management Plan will be implemented on the Site and will comprise the best practice for soil handling on the Site.

To avoid wastage, with reference to DEFRA's Soil Strategy (2009)¹⁴, 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.

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.

17.6.23 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.

Operational Phase

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

17.6.25 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).

¹⁵ GreenMatch, The Opportunities of Solar Panel Recycling [online] available at: <https://www.greenmatch.co.uk/blog/2017/10/the-opportunities-of-solar-panel-recycling> [last accessed 13th November 2024].

17.6.26 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. The electrical infrastructure, should it need replacing is also likely to be recycled.

17.6.27 The operational phase effects associated with waste are not anticipated to be significant. Waste generated during operation will be appropriately managed in accordance with all relevant legislation.

Decommissioning Phase

17.6.28 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).

17.6.29 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).

¹⁵ GreenMatch, The Opportunities of Solar Panel Recycling [online] available at: <https://www.greenmatch.co.uk/blog/2017/10/the-opportunities-of-solar-panel-recycling> [last accessed 13th November 2024].

- 17.6.30 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.
- 17.6.31 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.
- 17.6.32 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.
- 17.6.33 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.
- 17.6.34 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.
- 17.6.35 Underground cables will be disconnected from the local electricity network to be capped off and left in situ.
- 17.6.36 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.
- 17.6.37 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.
- 17.6.38 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

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

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.

- 17.6.39 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.

Mitigation Measures

- 17.6.40 A CEMP (comprising measures such as the avoidance of overordering, and the maximisation of re-use and recycling (where feasible)) will be secured via DCO requirement, and will be implemented on the Site prior to any construction works taking place. Similar measures would be included for the decommissioning phase of the Proposed Development.
- 17.6.41 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.

Cumulative Effects

- 17.6.42 There are a number of potential schemes 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.
- 17.6.43 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.
- 17.6.44 Management of the potential cumulative volumes of waste would be managed through the CEMP and decommissioning scheme. Consultation with waste management providers would be undertaken to ensure that waste can be accommodated.

17.6.45 Additionally, cumulative effects may occur from increased HGVs transporting waste to recycling plants and landfill. This will be further assessed in the ES supporting the application for development consent.

17.7 Major Accidents and Disasters

17.7.1 This section summarises the potential effects of the Proposed Development on the risks of major accidents or disasters occurring.

17.7.2 ‘Accidents’ are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g., major emission, fire or explosion).

17.7.3 ‘Disasters’ are naturally occurring extreme weather events or ground related hazard events (e.g., subsidence, landslide, earthquake).

Policy Context

17.7.4 The EIA Regulations require consideration to be given to the risks of major accidents and disasters.

Assessment Methodology

17.7.5 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.

17.7.6 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 17.2 below sets out the findings of this exercise.

Table 17. 2: Potential Major Accidents and Disasters associated with the Proposed Development

Major Accident or Disaster	Potential Risk and Receptor	Relevant Chapter or Appendix of the PEIR ¹⁷
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 it's potential to exacerbate flooding to property and people in areas of increased flood risk.	Chapter 8: Hydrology, Hydrogeology, Flood Risk and Drainage (
Fire within the Proposed Development	Risk of fire to local residents, habitats and species.	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 Chapter 13: Transport and Access Chapter 16: Glint and Glare
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
Aviation disasters	Risk from glint and glare to affect pilots and aircraft	Chapter 16: Glint and Glare
Flood defence failure	Risk of increased flooding or flooding to the Proposed Development	Chapter 8: Hydrology, Hydrogeology, Flood Risk and Drainage
Utilities failure (gas, electricity, water, sewage, oil, communications)	Risk of utilities failure to affect employees and local residents	The Major Accidents and Disasters section of this chapter.
Plant disease	Biosecurity risks from invasive and non-native species. Biosecurity risks from new planting and habitat comprising the Proposed Development.	Chapter 7: Ecology and Biodiversity (Ongoing assessment work to be provided in ES chapters submitted as part of DCO application).

¹⁷ Ongoing assessment work to be provided in ES chapters submitted as part of DCO application.

Baseline Conditions

- 17.7.7 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.
- 17.7.8 Details of the specific receptors that fall into the above categories are provided in Chapter 3 ‘The Site, Site Selection and Iterative Design Process’ of this PEIR.

Potential for the Proposed Development to cause Major Accidents and Disasters

Construction and Decommissioning Phases

Health and Safety at Work

- 17.7.9 With regard to the Overarching National Policy Statement for Energy EN-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.”***
- 17.7.10 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.
- 17.7.11 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 2015¹⁸. 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.
- 17.7.12 The construction of the Proposed Development would be managed in accordance with the Health and Safety at Work Act 1974, and would comply with all other relevant Health and Safety Regulations, including:
- The Construction (Health, Safety and Welfare) Regulations, 1996¹⁹;
 - Construction (Design and Management) Regulations 2015; and
 - Electricity Safety, Quality and Continuity Regulations, 2002²⁰.
- 17.7.13 No significant effects are anticipated.

Design of the Equipment

- 17.7.14 Health and Safety on the Site would be managed by the contractor during construction and decommissioning to mitigate the risk of equipment failure that could lead to a fire risk. 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.
- 17.7.15 It is intended that after the 40-year operational life of the solar panels, energy storage, and associated equipment will be removed from the Site.

Rail Accidents

- 17.7.16 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, significant effects pertaining to rail accidents are not anticipated. No significant effects are anticipated.

¹⁸ 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].

¹⁹ 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].

²⁰ 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].

Utilities Failure

- 17.7.17 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 (likely to be a 20m easement), including no solar panels in this area. No significant effects are therefore anticipated.

Operational Phase

Health and Safety of Workers

- 17.7.18 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 2010²¹.
- 17.7.19 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.
- 17.7.20 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 considered to be of negligible magnitude, and hence any related effects will not be significant.

Design of the Equipment

- 17.7.21 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.
- 17.7.22 The substation compound which will include transformers will be subject to routine maintenance such that it is not considered to pose a significant risk of creating an accident or disaster.
- 17.7.23 The Proposed Development has also been designed to include energy storage. The energy storage is located close to the main substation. The potential energy storage will include batteries, inverters and system controllers.

²¹ Health and Safety Executive (2010) Health and safety in the new energy economy

- 17.7.24 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 is worth highlighting that the majority of energy storage sites continue to operate without any problems which means that the risk is quite small.
- 17.7.25 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. A number (to be confirmed in the subsequent ES) of Battery Storage Enclosures (BSEs) will form the BESS / Substation element of the Proposed Development.
- 17.7.26 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.
- 17.7.27 Each BSE forming part of the BESS / Substation 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.
- 17.7.28 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 will be assessed as part of the Flood Risk Assessment accompanying Chapter 8: Hydrology, Hydrogeology and Flood Risk and Drainage in the final ES application, 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.

- 17.7.29 The Proposed Development design will include adequate separation between energy storage units to ensure that an isolated fire would not become widespread and lead to a major incident.
- 17.7.30 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. An outline Battery Fire Safety Plan will be submitted with the application for development consent, which will be agreed with the Fire and Rescue service. Following this, the Battery Fire Safety Plan (secured via DCO requirement) will be implemented on the Site prior to the operational phase.
- 17.7.31 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.
- 17.7.32 Significant effects on the risk of fire are considered to be unlikely.

Rail Accidents

- 17.7.33 Cabling will cross the railway that traverses the western portion of the Site; cabling will be undergrounded. The cable crossing will be designed to meet the specific requirements of Network Rail and therefore the risk of a rail accident as a result of the crossing will be minimised. Therefore, significant effects on rail accidents are not anticipated.

Utilities Failure

- 17.7.34 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 the buffers that the operators have requested to be applied to the design are in place (like to be a 20m easement) including no solar panels in this area. The operators will run their own maintenance programme which will include their own Health and Safety programme and procedures to implement.
- 17.7.35 Through careful design consideration of the Proposed Development, and operators following implemented site management and Health and Safety procedures, significant effects are considered to be unlikely.

Mitigation Measures

- 17.7.36 Minimising the risk of major accidents during construction and decommissioning will be addressed through appropriate risk assessments as required in the CEMP.

Cumulative Effects

- 17.7.37 With regard to the adjacent solar development under BDC planning application reference 20/00117/FUL, there are no anticipated significant cumulative effects. The same Health and Safety restrictions will apply to the Site and that scheme under 20/00117/FUL which would limit the exposure of receptors to significant risk. 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 of this PEIR are not anticipated to be significant. Further detail will follow within the relevant chapters of the subsequent ES (e.g., Air Quality, Noise, and Transport and Access).
- 17.7.38 All of the other cumulatively listed schemes are not located in proximity to the Site to have any notable inter-relationship of effects. Additionally, with the implementation of a CEMP, 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.

Summary

- 17.7.39 The above environmental topics have been demonstrated to not cause likely significant effects and it is considered that these topics do not require a full chapter within this PEIR and subsequent ES. Therefore, no summary table of significant effects, mitigation and residual effects is presented within this chapter.