



**WHITESTONE**  
solar farm

# WHITESTONE SOLAR FARM

## Volume 6: Environmental Statement

### 6.16 Chapter 6.16: Other Environmental Topics

Application Document ref. EN0110020/APP/6.16

Revision 01

June 2026

**Planning Act (2008)**  
Infrastructure Planning (Applications:  
Prescribed Forms and Procedure)  
Regulations 2009  
**Regulations 5(2)(a)**

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## ENVIRONMENTAL STATEMENT

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Document Status					
Version	Purpose of Document	Authored by	Reviewed by	Approved by	Review Date
Rev01	DCO Submission	ERM	TLT, Pershing, DWD, AECOM, Whitestone Net Zero Ltd	Whitestone Net Zero Ltd	01/06/2026

Approval for Issue		
Whitestone Net Zero Ltd		1 June 2026

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**ES Volume 3, Appendices [EN0110020/APP/6.20]**

Appendix Number	Appendix Title
2.1	EIA Scoping Report
2.2	EIA Scoping Opinion
16.1	Legislation, Policy, and Guidance
16.2	Glint and Glare Report

**Glossary**

Term	Meaning
<i>Cable Corridors</i>	Corridors within which the high voltage cables would be constructed.
<i>Draft Environmental Statement</i>	The Draft Environmental Statement which presented the preliminary environmental information relating to the Proposed Development. The Draft ES was prepared to present information for statutory consultation in accordance with current EIA regulation.
<i>Environmental Statement (ES)</i>	The Environmental Statement which presents the environmental information relating to the Proposed Development. The ES has been prepared to present information for formal consultation in accordance with current EIA regulation.
<i>Order Limits</i>	Maximum extent of the Proposed Development comprising the Site and Cable Corridors.
Long Lane 400kV Substation	The new 400 kilovolt National Grid substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ.
<i>The Applicant</i>	Whitestone Net Zero One Ltd.
<i>The Application</i>	The Application submitted to the Secretary of State for a Development Consent Order.
<i>The Proposed Development</i>	The proposed Whitestone Solar Farm.
<i>The Site</i>	The land planned to be used for solar PV array and associated infrastructure, BESS substation, and landscaping and habitat enhancement. The Site is split into W1, W2, and W3.
<i>Whitestone 1</i>	The northern parcels of the Whitestone Solar Farm.
<i>Whitestone 2</i>	The middle parcels of the Whitestone Solar Farm.
<i>Whitestone 3</i>	The southern parcels of the Whitestone Solar Farm.

**Acronyms**

Acronym	Meaning
<i>AIL</i>	Abnormal Indivisible Load
<i>AL</i>	Action Level
<i>ALARP</i>	As Low As Reasonably Practicable
<i>ALC</i>	Agricultural Land Classification
<i>ATC</i>	Automatic Traffic Counts

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Acronym	Meaning
<i>BAT</i>	Best Available Techniques
<i>BESS</i>	Battery Energy Storage System
<i>BGL</i>	Below Ground Level
<i>CAA</i>	Civil Aviation Authority
<i>CAT</i>	Cable Avoidance Tool
<i>CCRR</i>	Climate Change Resilience Review
<i>CEMP</i>	Construction Environmental Management Plan
<i>CoP</i>	Code of Practice
<i>DECC</i>	Department of Energy and Climate Change
<i>DEMP</i>	Decommissioning Environmental Management Plan
<i>DESNZ</i>	Department for Energy Security and Net Zero
<i>DoW</i>	Definition of Waste
<i>EIA</i>	Environmental Impact Assessment
<i>ELV</i>	Exposure Limit Value
<i>EMF</i>	Electromagnetic Fields
<i>EMS</i>	Environmental Management System
<i>ES</i>	Environmental Statement
<i>FAA</i>	Federal Aviation Administration
<i>FRA</i>	Flood Risk Assessment
<i>HDD</i>	Horizontal Direction Drilling
<i>HRA</i>	Hazard and Risk Analysis
<i>ICNIRP</i>	International Commission on Non-Ionizing Radiation Protection
<i>IEMA</i>	Institute for Environmental Management and Assessment
<i>ISEP</i>	Institute of Sustainability and Environmental Professionals
<i>JHA</i>	Job Hazard Analysis
<i>KPI</i>	Key Performance Indicator
<i>LPA</i>	Local Planning Authority
<i>LSE</i>	Likely Significant Effect
<i>LVIA</i>	Landscape and Visual Impact Assessment
<i>MADs</i>	Major Accidents and Disasters
<i>MAH</i>	Major Accident Hazard
<i>MBNL</i>	Mobile Broadband Network Limited
<i>MMP</i>	Material Management Plan
<i>NESO</i>	National Energy System Operator
<i>NGESO</i>	National Grid Electricity System Operator
<i>NGET</i>	National Grid Electricity Transmission
<i>NPPF</i>	National Planning Policy Framework

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Acronym	Meaning
<i>NPS</i>	National Policy Statement
<i>NPPW</i>	National Planning Policy for Waste
<i>NRTS</i>	National Roads Telecommunications Services
<i>NSIP</i>	Nationally Significant Infrastructure Project
<i>oCEMP</i>	Outline Construction Environmental Management Plan
<i>oBSMP</i>	Outline Battery Safety Management Plan
<i>oDEMP</i>	Outline Decommissioning Environmental Management Plan
<i>OEMP</i>	Operational Environmental Management Plan
<i>oOEMP</i>	Outline Operational Environmental Management Plan
<i>oSMP</i>	Outline Soil Management Plan
<i>oSWMP</i>	Outline Site Waste Management Plan
<i>PCS</i>	Power Conversion Stations
<i>POC</i>	Point of Connection
<i>PRoW</i>	Public Rights of Way
<i>PV</i>	Photovoltaic
<i>RMBC</i>	Rotherham Metropolitan Borough Council
<i>RTC</i>	Road Traffic Collision
<i>SMP</i>	Soil Management Plan
<i>SuDS</i>	Sustainable Drainage Systems
<i>SWDS</i>	Surface Water Drainage Strategy
<i>SWMP</i>	Site Waste Management Plan
<i>SYFR</i>	South Yorkshire Fire Rescue
<i>WEEE</i>	Waste Electrical and Electronic Equipment
<i>WMP</i>	Waste Management Plan
<i>W1</i>	Whitestone 1
<i>W2</i>	Whitestone 2
<i>W3</i>	Whitestone 3
<i>YWS</i>	Yorkshire Water Services
<i>ZoI</i>	Zone of Influence

### Units

Units	Meaning
<i>ha</i>	Hectares
<i>km</i>	Kilometres
<i>kV</i>	Kilovolts
<i>m</i>	Metres
<i>m<sup>3</sup></i>	Metres cubed

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Units	Meaning
$Vm^{-1}$	Volt per metre
$\mu T$	Microtesla

# 16 OTHER ENVIRONMENTAL TOPICS

## 16.1 Introduction

- 16.1.1 This Chapter of the Environmental Statement (ES) presents the findings of the assessment of the likely significant effects on environmental topics which do not warrant their own chapter as agreed with the Planning Inspectorate (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).

This Chapter of the ES evaluates the potential effects of the construction, operation and maintenance, and decommissioning of Whitestone Solar Farm (the Proposed Development) in relation to:

- Waste (Section 16.2)
- Glint and Glare (Section 16.3)
- Telecommunications and Utilities (Section 16.4)
- Major Accidents and Disasters (Section 16.5); and
- Electromagnetic Fields (Section 16.6).

### Order Limits

- 16.1.2 The extent of the Order Limits are described in **ES Volume 1, Chapter 3: The Site and Surrounding Area [EN0110020/APP/6.3]** and shown in **ES Volume 3, Figure 3.1: Order Limits [EN0110020/APP/6.19]**. The Proposed Development is described in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** and shown spatially on the **Works Plans [EN0110020/APP/2.3]**.

### The Proposed Development

- 16.1.3 The Proposed Development involves the construction, operation and maintenance, and decommissioning of more than 100 megawatt (MW) of solar photovoltaic (PV) array, Battery Energy Storage System (BESS), onsite substations and supporting infrastructure, and grid connection infrastructure. The grid connection infrastructure would connect the Proposed Development to the National Grid at the new 400 kilovolt (kV) National Grid substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ (Long Lane 400kV Substation). National Grid have applied to Rotherham Metropolitan Borough Council (RMBC) for the development of this new substation which is intended by National Grid to be operational in time for the Proposed Development to connect in 2029. This substation is therefore not included in the Proposed Development and will be subject to a separate planning application taken forward by National Grid.
- 16.1.4 As the Proposed Development would have a generating capacity in excess of 100MW, it is considered to be a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008.

- 16.1.5 The Proposed Development would be located within the Order Limits. The Order Limits encompass the total area of the project comprising the Site and Cable Corridors. The Site is specifically the land that is planned to be used for solar PV array and associated infrastructure, BESS, substation, landscaping and habitat enhancement. The Site is split into Whitestone 1 (W1), Whitestone 2 (W2), and Whitestone 3 (W3).
- 16.1.6 Highway Works are sections of the highway network that will contain localised improvements, such as improvements to road edge where it is deteriorated, or temporary highway and traffic works required to safely accommodate the Abnormal Indivisible Load (AIL) deliveries. These areas will support the movement of construction vehicles on narrower sections of the local highway network within parts of the construction vehicle routes to the Site (as described in **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]**).
- 16.1.7 This Chapter is supported by the following appendices in **ES Volume 3 [EN0110020/APP/6.20]**:
- **Appendix 2.1: EIA Scoping Report**
  - **Appendix 2.2: EIA Scoping Opinion**
  - **Appendix 16.1: Legislation, Policy and Guidance;** and
  - **Appendix 16.2: Glint and Glare Report.**

### Issues Scoped out of the Environmental Impact Assessment (EIA)

- 16.1.8 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025.
- 16.1.9 As described in the EIA Scoping Report and accepted in the EIA Scoping Opinion (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**), potential effects to Human Health and Population are considered in the ES technical chapters, where there are relevant receptors e.g. air quality, traffic and transport, noise and landscape. A standalone assessment chapter for Human Health and Population is scoped out of the EIA. **Table 16.1** shows the technical topics, in relation this Chapter, scoped out of the EIA following the scoping exercise and the rationale behind this decision.

**Table 16.1: Topics Scoped Out**

Potential Effect / Topic	Proposal for Assessment within EIA	Development Phase	Rationale
Human Health	Effects on human health are to be assessed within the Landscape and Visual Impact Assessment (LVIA), Air Quality, Traffic and Transport, and Noise and Vibration assessments.	All phases	A separate chapter on human health is not necessary as human health receptors are considered in the following chapters of <b>ES Volume 2</b> ,

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Potential Effect / Topic	Proposal for Assessment within EIA	Development Phase	Rationale
			<p><b>Chapter 7: Landscape and Visual Impact Assessment [EN0110020/APP/6.7]; ES Volume 2, Chapter 12: Air Quality [EN0110020/APP/6.12]; ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]; and ES Volume 2, Chapter 14: Noise and Vibration [EN0110020/APP/6.14].</b></p> <p>In response to the comment raised by the Planning Inspectorate in 3.11.7 in the EIA Scoping Opinion, effects on mental health and wellbeing of the general population as result of landscape and visual impacts are considered in the intra – projects effects section in <b>ES Volume 2, Chapter 17: Cumulative Effects Assessment [EN0110020/APP/6.17].</b></p>
Population	Effects on Population are assessed in the Socio-Economics, Tourism, Recreation and Land-Use assessments	All phases	A separate chapter on population has been scoped out as relevant receptors are considered within <b>ES Volume 2, Chapter 15: Socio-Economics, Tourism, Recreation and Land-Use [EN0110020/APP/6.15].</b>

## 16.2 Waste

### Legislation, Policy and Guidance

16.2.1 The legislation, policy, and guidance related to waste, as detailed in **ES Volume 3, Appendix 16.1: Legislation, Policy and Guidance [EN0110020/APP/6.20]**, and relevant to the Proposed Development, are outlined below.

#### Legislation

16.2.2 Legislation that has been considered includes:

- Waste Framework Directive 2008<sup>1</sup>
- Waste (England and Wales) Regulations 2011 and Waste (England and Wales) (Amendment) Regulations 2014<sup>2</sup>
- Environmental Protection Act 1990<sup>3</sup>
- Duty of Care Regulations 1991<sup>4</sup>
- Controlled Waste (England and Wales) Regulations 2012<sup>5</sup>
- Environmental Permitting (England and Wales) Regulations 2016<sup>6</sup>
- Landfill Directive 1999<sup>7</sup>
- The Hazardous Waste (England and Wales) Regulations 2005<sup>8</sup>
- Schedule 4 of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017<sup>9</sup> (EIA Regulations 2017)
- Part 3 of the Environment Act 2021<sup>10</sup>
- Special Waste Regulations 1996 and Special Waste (Amendment) Regulations 1996<sup>11</sup>
- The Waste (Circular Economy) (Amendment) Regulations 2020<sup>12</sup>; and
- Waste Electrical and Electronic Equipment (WEEE) Regulations 2013<sup>13</sup>; and Waste Electrical and Electronic Equipment (Amendment) Regulations 2018<sup>14</sup>.

#### National Policy

16.2.3 National policy that has been considered includes:

- National Policy Statements (NPS): Overarching NPS for Energy (EN-1) (2025)<sup>15</sup>
- National Planning Policy Framework (2024)<sup>16</sup>
- National Planning Policy for Waste (NPPW) (2014)<sup>17</sup>
- Waste Management Plan for England 2021<sup>18</sup>
- Environmental Improvement Plan 2023<sup>19</sup>
- Our Waste, Our Resources: A Strategy for England (2018)<sup>20</sup>; and
- The Waste Prevention Programme for England: Maximising Resources, Minimising Waste (2023)<sup>21</sup>.

### Local Policy

16.2.4 Local policy that has been considered includes:

- Barnsley, Doncaster and Rotherham Joint Waste Plan 2012<sup>22</sup>; and
- Derby and Derbyshire Waste Local Plan 2005<sup>23</sup>.

### Guidance

16.2.5 Supporting guidance that has been considered includes:

- *The Definition of Waste: Development Industry Code of Practice (DoW: CoP)*<sup>24</sup>
- National Planning Practice Guidance – Waste<sup>25</sup>
- Waste Duty of Care Code of Practice<sup>26</sup>; and
- *Institute for Environmental Management and Assessment (IEMA) (now known as the Institute of Sustainability and Environmental Professionals, ISEP) Guide to Materials and Waste in Environmental Impact Assessment*<sup>27</sup>.

16.2.6 More detailed information regarding the above legislation, policy and guidance can be found in **ES Volume 3, Appendix 16.1: Legislation, Policy and Guidance [EN0110020/APP/6.20]**.

### Consultation

16.2.7 This section provides a summary of the consultation undertaken to date regarding the Proposed Development.

### EIA Scoping

16.2.8 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025. The Scoping Report captures the findings of the scoping exercise and outlines the technical guidance, standards, best practices, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Proposed Development on Waste.

16.2.9 A Scoping Opinion was received from the Planning Inspectorate on 3 June 2025 (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).

16.2.10 **Table 16.2** summarises how this Chapter of the ES addresses key points from the EIA Scoping Opinion comments related to Waste.

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**Table 16.2: Scoping Opinion Comments and How They Are Addressed in This ES**

<b>Consultee</b>	<b>Issue Raised</b>	<b>How is This Addressed</b>	<b>Where This is Addressed in the ES</b>
<i>The Planning Inspectorate</i>	<b>ID 3.11.1 Waste:</b> <i>“The Scoping Report proposes to scope out effects from waste during construction, operation and decommissioning on the basis that the Proposed Development would comply with relevant waste legislation and that mitigation in the form of best practice measures, adherence to the waste hierarchy and appropriate monitoring to ensure compliance will be secured. The Inspectorate does not agree to scope this matter out on the basis that insufficient information has been provided.”</i>	Waste has been scoped back into the assessment.	<b>ES Volume 2, Chapter 16: Other Environmental Topics [EN0110020/APP/6.16]</b> Paragraphs 16.2.89 to 16.2.108 (Embedded Mitigation) provide details of the Proposed Development’s approach to minimising and managing waste.
<i>The Planning Inspectorate</i>	<b>ID 3.11.1 Waste:</b> <i>“The Inspectorate considers that significant amounts of waste could be produced during construction, operation (e.g. panel replacement) and decommissioning (e.g. disposal of infrastructure) and further information is required to demonstrate that this would not lead to a likely significant effect (LSE). The ES should include estimates, by type and quantity, of expected residues and emissions and quantities and types of waste produced during the construction, operation</i>	Anticipated waste volumes during construction, operation and maintenance and decommissioning phases have been provided in the ‘Basis of Assessment’ section of Section 16.2.  The assessment of the likely significant effects of the Proposed Development on waste generation is provided in the ‘Assessment of Effects’ section of Section 16.2.	Paragraphs 16.2.48 to 16.2.52 (Basis of the Assessment) and paragraphs 16.2.109 to 16.2.126 (Assessment of Effects).

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Consultee	Issue Raised	How is This Addressed	Where This is Addressed in the ES
	<i>and decommissioning phases....”</i>		
<i>The Planning Inspectorate</i>	<b>ID 3.11.1 Waste:</b> <i>“The ES should...assess any LSE arising from the transportation and disposal of waste.”</i>	The potential effects of traffic movements associated with the transport of waste material generated by the Proposed Development are assessed in <b>ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6/13]</b> .	<b>ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]</b>
<i>The Planning Inspectorate</i>	<b>ID 3.11.1 Waste:</b> <i>The assessment “should include any potential cumulative effects where they are likely to be significant”</i>	The potential cumulative effects of the Proposed Development with respect to waste generation and management are considered in paragraphs 16.2.127 to 16.2.128 (Cumulative Effects) and in <b>ES Volume 2, Chapter 17: Cumulative Effects Assessment [EN0110020/APP/6.17]</b> .	Paragraphs 16.2.127 to 16.2.128 (Cumulative Effects) of this Chapter and <b>ES Volume 2, Chapter 17: Cumulative Effects Assessment [EN0110020/APP/6.17]</b>
<i>The Planning Inspectorate</i>	<b>ID 3.11.1 Waste:</b> <i>“The ES should outline what measures, if any, are in place to ensure that components (e.g. from batteries and / or panels) are able to be diverted from the waste chain and disposed of safely given that some types of solar panels can contain hazardous materials.”</i>	Proposed mitigation measures are outlined in paragraphs 16.2.89 to 16.2.108 (Embedded Mitigation), including segregation and management of potentially hazardous wastes.	Paragraphs 16.2.89 to 16.2.108 (Embedded Mitigation).

### Issues Scoped Out of Assessment

16.2.11 No issues related to waste have been scoped out of the assessment.

### Statutory Consultation

16.2.12 A Statutory Consultation period was held between 16 September and 28 October 2025 in line with Section 47 of the Planning Act 2008. Feedback was sought from the local community and a range of consultee bodies based on the preliminary information and assessments presented in the Draft Environmental Statement (Draft ES).

16.2.13 **Table 16.3** presents feedback from statutory consultees given at Statutory Consultation in relation to waste, and how this is addressed in this ES.

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**Table 16.3 Statutory Consultation Feedback from the Statutory Consultation Period**

Consultee	Consultee Feedback	How This is Addressed in the ES	Where This is Addressed in the ES
<p><i>Environment Agency</i></p>	<p><i>“It appears no environmental permits around waste are required. This should be clarified and reflected within the Consenting Strategy.”</i></p>	<p>Based on the current design, no permits in relation to waste are anticipated to be required. However, if in the future any materials likely to be classified as ‘waste’ under the Waste Framework Directive 2008 are proposed to be re-used, for example, waste permits and/or exemptions will be sought. Further details can be found in: <b>Consents and Agreements Position Statement [EN0110020/APP/5.3]</b></p>	<p>Paragraphs 16.2.89 to 16.2.108 (Embedded Mitigation) provide details of the Proposed Development’s approach to minimising and managing waste.</p>

### Targeted Consultation

- 16.2.14 A Targeted Consultation period was held between 4 March and 3 April 2026 on proposed changes to the Order Limits. This included notifying relevant prescribed consultees. Feedback from this Targeted Consultation and the Applicant's response is included in the **Consultation Report [EN0110020/APP/5.1]**.
- 16.2.15 A second Targeted Consultation was held for any individuals that had been identified as land interests after the Statutory Consultation.
- 16.2.16 No comments were provided by statutory consultees through the Targeted Consultation period in relation to Waste.

### Assessment Methodology and Significance Criteria

- 16.2.17 This section sets out the scope and methodology for the assessment of the impacts of the Proposed Development on waste from the construction, operation and maintenance and decommissioning phases.

### Scope of Assessment

#### Construction

- 16.2.18 Waste will be generated during construction, from activities including:
- Groundworks, preparation and levelling, which may generate excess soils
  - Excavations for foundations and excavations / Horizontal Directional Drilling (HDD) for laying of underground cables; and
  - Use of general construction materials and installation of equipment.
- 16.2.19 The greatest volume of waste is anticipated to be excess soils. The following soil management design principles will be applied as the construction methodology develops:
- **Net Cut-Fill Balance and Re-use of Soils:** The Proposed Development design aims to achieve a net cut-fill balance, if possible, and will maximise the re-use of suitable soils recovered from groundworks, preparation and excavations (subject to chemical and geotechnical suitability). The re-use of soils will be subject to appropriate management measures, as described in the outline Soil Management Plan which will be included within the **outline Construction Environmental Management Plan (oCEMP) [EN0110020/APP/5.9]**. If suitable locations for re-use of excavated soils cannot be identified within the Proposed Development, appropriate off-site locations will be sought. Offsite re-use of soils, if undertaken, will be implemented via a Materials Management Plan (MMP). The requirement for an MMP is included in the oCEMP. No import of soils is anticipated to be required; and
  - **Management of 'Waste' Soils:** Soils not deemed suitable for re-use, e.g. due to chemical or geotechnical unsuitability, will be considered as 'waste' soils. Waste soils will be stockpiled, classified, and disposed of off-site to a suitably licensed facility. The volume of waste soils generated during construction will depend on the geotechnical properties of the soil and the extent and nature of ground contamination, if present, at the Proposed Development (also see **ES**

### **Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9].**

- 16.2.20 In addition to soil, other construction wastes generated by the Proposed Development (e.g. surplus inert construction materials, packaging, general waste from temporary welfare facilities) will also require management and off-site disposal. The majority of other construction wastes are anticipated to be amenable to recycling.
- 16.2.21 The assessment considers the potential for soil and non-soil wastes generated by construction of the Proposed Development requiring off-site disposal to landfill to exceed the capacity of regional landfill facilities. Potential effects on soil, groundwater or surface water quality arising from the handling and storage of construction phase wastes is considered in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]** and **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.
- 16.2.22 Liquid wastes generated during construction are anticipated to comprise:
- Surface water runoff and water generated by dewatering of excavations, if required
  - Drilling fluids from HDD, if required
  - Small amounts of waste oils etc. from plant / machinery; and
  - Sanitary wastewater from temporary welfare facilities.
- 16.2.23 Management of surface water runoff and water generated by dewatering of excavations is considered in **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**. All other liquid wastes generated during construction will be disposed off-site by a licensed waste management contractor who will be appointed by the construction contractor. Therefore, liquid wastes are not considered further in this assessment.
- 16.2.24 Sanitary / foul wastewater generated from temporary welfare facilities during construction of the Proposed Development will be removed by licensed waste carriers in accordance with regulatory requirements. Therefore, sanitary/foul waste is not considered further in this assessment.

### **Operation and Maintenance**

- 16.2.25 Waste generated during the operation and maintenance phase of the Proposed Development will be significantly less in volume than that during construction (and decommissioning) but may include materials that require specialist treatment and disposal.
- 16.2.26 Waste types generated by operation and maintenance activities associated with the Proposed Development are anticipated to include:
- General waste from maintenance activities, including temporary welfare facilities
  - Dry mixed recyclables, including wood, metal, plastic, paper and cardboard
  - Expired or damaged electrical components; and
  - Small amounts of other waste from maintenance activities, potentially including hazardous waste (e.g. waste oils).
- 16.2.27 The assessment considers the potential for the waste generated by operation and maintenance of the Proposed Development requiring off-site disposal to landfill to

exceed the capacity of regional landfill facilities. Potential effects on soil, groundwater or surface water quality arising from the handling and storage of operational phase wastes is considered in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]** and **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.

- 16.2.28 Liquid wastes generated during operation and maintenance of the Proposed Development are anticipated to be limited to:
- Wastewater from cleaning of the solar PV modules; and
  - Sanitary wastewater from temporary welfare facilities for maintenance works.
- 16.2.29 Cleaning of the solar PV modules will be carried out using low-pressure systems with water allowed to infiltrate to ground naturally. Biodegradable detergents will be used where necessary. All operational wastewater generation will be managed in line with best practice to minimise environmental impact and ensure compliance with relevant regulations. Wastewater management is considered further in **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.
- 16.2.30 Sanitary / foul wastewater generated from welfare facilities during operation and maintenance of the Proposed Development will be removed by licensed waste carriers in accordance with regulatory requirements. Therefore, sanitary/foul waste is not considered further in this assessment.

### Decommissioning

- 16.2.31 Decommissioning will be undertaken at the end of the design life of the Proposed Development, which is anticipated to be 60 years.
- 16.2.32 Decommissioning activities are anticipated to be essentially the reverse of the construction sequence. However, no surplus soils are anticipated to be generated during decommissioning.
- 16.2.33 The primary waste stream associated with the decommissioning phase will be the solar PV module materials (metal, electrical cables, etc.), much of which is likely to be amenable to recycling 60 years into the future.
- 16.2.34 Small amounts of liquid waste associated with surface water runoff during decommissioning activities may be generated, along with small amounts of waste oil from plant / machinery.

### Summary of Scope of Assessment

- 16.2.35 In line with the ISEP (formerly IEMA) guidance, the assessment considers the potential effects associated with the disposal of waste to landfill resulting from the proposed activities described above. The potential effects identified are as follows:
- Disposal of excess soils and other construction wastes during construction placing a potentially Significant burden on the regional landfill capacity;
  - Disposal of operational phase wastes placing Significant burden on the regional landfill capacity; and
  - Disposal of decommissioning phase wastes placing Significant burden on the regional landfill capacity.

- 16.2.36 As described above, the potential for handling and storage of construction and operational phase wastes in working areas of the Proposed Development to impact soil, groundwater or surface water quality is considered in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]** and **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**. Handling and disposal of liquid wastes during all phases of the Proposed Development resulting in potential impacts on water quality in the receiving environment is considered in **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.
- 16.2.37 In addition, potential indirect effects, such as on residential receptors on the transportation routes between the Proposed Development and landfill facilities and generation of greenhouse gases and climate change, are considered in **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]** and **ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]**, respectively.

### Study Area

- 16.2.38 For the purpose of the waste assessment, the Study Area is considered to be the Yorkshire and the Humber planning region and East Midlands planning region, as defined by the Environment Agency for waste reporting.
- 16.2.39 The majority of the Proposed Development is located within the Yorkshire and the Humber planning region (South Yorkshire sub-region), with a small extent at the southern end of the Cable Route N located within the East Midlands planning region (Derbyshire sub-region). Particular consideration is given to these sub-regions to reduce the potential for secondary effects associated with longer waste transportation distances.
- 16.2.40 The use of planning regions and sub-regions to define the Study Area for this topic is aligned with the ISEP guidance for waste impact assessments.

### Identifying Receptors and Receptor Sensitivity

- 16.2.41 Registered landfill sites used by the Proposed Development may be affected by construction, operation (including maintenance) and decommissioning of the Proposed Development through a material increase in the volume of waste received. This is most likely to occur during the construction and decommissioning phases of the Proposed Development, during which projected waste volumes are expected to be the highest.
- 16.2.42 Potential effects associated with increased traffic resulting from transportation of waste are considered in **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]** and **ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]**. In addition, **ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]** considers potential effects of waste on greenhouse gas emissions.
- 16.2.43 At the point of waste generation, handling and storage of waste may affect soils, surface and groundwater receptors on land used by the Proposed Development during construction and operation. Potential effects of waste on soils and groundwater resources are addressed in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]** and on surface water

resources in **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.

**Assessment Methodology**

16.2.44 In order to assess the significance of the Proposed Development on the baseline landfill capacity, the following significance criteria are applied, in line with Method W1 (Void Capacity) of the ISEP guidance<sup>27</sup>.

**Receptor Sensitivity**

16.2.45 In line with ISEP guidance<sup>27</sup>, the sensitivity of landfill void capacity as a receptor is assessed as the availability of regional (and where appropriate, national) capacity in the absence of the Proposed Development, as presented in **Table 16.4**, below.

**Table 16.4 Evaluation Criteria for Assessment of Receptor Sensitivity (ISEP, 2020)**

Sensitivity of Receptor	Criteria for Effects of Waste Generated during Construction and/or Operational Phases	
	Inert / Non-Hazardous Waste	Hazardous Waste
Negligible	Regional landfill void capacity is expected to remain unchanged or increase	Regional, or where justified national, landfill void capacity is expected to remain unchanged or increase
Low	Regional landfill void capacity is expected to reduce minimally (<1%)	Regional, or where justified national, landfill void capacity is expected to reduce minimally (<0.1%)
Medium	Regional landfill void capacity is expected to reduce noticeably (1 – 5%)	Regional, or where justified national, landfill void capacity is expected to reduce noticeably (0.1 – 0.5%)
High	Regional landfill void capacity is expected to reduce considerably (6 – 10%)	Regional, or where justified national, landfill void capacity is expected to reduce considerably (0.5 – 1%)
Very High	Regional landfill void capacity is expected to reduce considerably (>10%)	Regional, or where justified national, landfill void capacity is expected to reduce considerably (>1%)

**Impact Magnitude**

16.2.46 **Table 16.5**, below, presents the criteria used in order to assess the magnitude of impact on the baseline landfill capacity, in line with Method W1 (Void Capacity) of the ISEP guidance<sup>27</sup> on the basis of a forecast reasonable worst-case scenario.

**Table 16.5: Evaluation Criteria for Assessment of Effects on Landfill Capacity (IEMA, 2020)**

Magnitude of Impact	Criteria for Effects of Waste Generated during Construction and/or Operational Phases	
	Inert / Non-Hazardous Waste	Hazardous Waste
No Change	Zero waste generation / disposal from the development	Zero waste generation / disposal from the development
Negligible	Waste generated by the development will reduce regional landfill capacity by <1%	Waste generated by the development will reduce regional landfill capacity by <0.1%
Minor	Waste generated by the development will reduce regional landfill capacity by 1 - 5%	Waste generated by the development will reduce regional landfill capacity by 0.1 – 0.5%
Moderate	Waste generated by the development will reduce regional landfill capacity by 6 - 10%	Waste generated by the development will reduce regional landfill capacity by 0.5 - 1%
Major	Waste generated by the development will reduce regional landfill capacity by >10%	Waste generated by the development will reduce regional landfill capacity by >1%

**Significance of Effects**

16.2.47 The significance of effect is determined by assessing the potential magnitude of impact on the receptors against the sensitivity of the receptor. **Table 16.6**, below, presents the matrix for evaluation of the significance of effects, in line with ISEP guidance<sup>27</sup> Moderate, large or very large effects are considered Significant in EIA terms.

**Table 16.6 Matrix for Evaluation of Significance of Effects**

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity of Receptor	Very High	Neutral	Slight	Moderate / Large	Large / Very Large	Very Large
	High	Neutral	Slight	Slight / Moderate	Moderate / Large	Large / Very Large
	Medium	Neutral	Neutral / Slight	Slight	Moderate	Moderate / Large
	Low	Neutral	Neutral / Slight	Neutral / Slight	Slight	Slight / Moderate
	Negligible	Neutral	Neutral	Neutral / Slight	Neutral / Slight	Slight

### Basis of the Assessment

- 16.2.48 **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** presents a summary of the design parameters for the Proposed Development which has been used to inform this assessment.
- 16.2.49 The following sections present the design parameters that are of relevance to waste generation and management, and which have been used to assess the potential waste-related effects of the Proposed Development.
- 16.2.50 At this stage in the design process, some specific design information is yet to be defined or cannot yet be fixed. Where this is the case, the Rochdale Envelope Approach has been utilised (as outlined in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**), and the realistic worst-case has been assessed, using known maximum and minimum design parameters where appropriate. These cases are described in the following sections.
- 16.2.51 Where information gaps and uncertainties remain, key assumptions are presented in the 'Assumptions, Exclusions and Limitations' section, below.
- 16.2.52 Embedded mitigation committed to by the Applicant forms part of this basis of assessment. Embedded mitigation measures directly relevant to waste are described in paragraphs 16.2.89 to 16.2.108.

### Construction

- 16.2.53 As described in the 'Scope of Assessment' section, above, construction of the Proposed Development is anticipated to generate excess soils (e.g. from Site preparation and levelling, excavations, HDD) and other general construction waste (e.g. from the use of construction materials and installation of equipment).

### Surplus Soils

- 16.2.54 In relation to surplus soils, the Proposed Development design aims to re-use as much excavated soil as possible on Site (in line with a Soil Management Plan (SMP), which will be prepared as a supporting plan to the Construction Environmental Management Plan (CEMP)), e.g. for landscaping, or offsite (under an MMP), subject to it being suitable for re-use. However, it is acknowledged that some excavated soil may be unsuitable for re-use based on its physical properties and/or the presence of contamination. In this case, the soil will become a 'waste' and will require offsite disposal.
- 16.2.55 The vast majority of the surplus soil generated is anticipated to comprise natural topsoil and subsoil from previously undeveloped areas with limited identified potential sources of contamination (see **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]**). However, a small proportion of the total surplus soil may comprise Made Ground and / or contaminated soils associated with identified potential sources and is unlikely to be suitable for re-use onsite. The majority of this material is anticipated to be suitable for disposal as 'non-hazardous' waste and only a minor amount (estimated < 10%) anticipated to require disposal as 'hazardous' waste (e.g. due to the presence of contamination), subject to appropriate laboratory testing.
- 16.2.56 **Table 16.7**, below, summarises the relevant design parameters used to complete the waste assessment in relation to the anticipated volume of waste soils. Volumes provided in **Table 16.7** are considered to be reasonable worst-case

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estimates based on the worst case design parameters. Once detailed design is carried out, final totals may be substantially below this level.

**Table 16.7 Design Parameters - Waste Soil from Construction**

Construction Element	Anticipated Volume of Waste Soil (m <sup>3</sup> )	Assumptions
Solar PV module mounts	Zero	Driven piles or helical screws to maximum 3m below ground level (BGL) – no arisings generated.
Power Conversion Stations (PCS) – Foundation Excavations	850	140 no. PCS, each located on a hardstanding slab foundation measuring 13m x 3m x 2m deep. Majority situated on inferred previously undeveloped land, some areas of mapped infilled ground in W2 and W3: 94% of excavated soil assumed to be re-used; 6% assumed to require landfill disposal.
BESS – Foundation Excavations	1,750	Each battery unit to be on a hardstanding slab foundation measuring 13m x 5m x 2m deep. Indicative design includes 498 units. Combined footprint of ancillary buildings measuring up to 40m x 40m, located on a hardstanding slab foundation 2m deep. Situated on inferred previously undeveloped land - 98% of excavated soil assumed to be re-used; 2% assumed to require landfill disposal.
Primary Substation – Foundation Excavations	2,250	One primary substation with footprint measuring 170m x 100m, located on a hardstanding slab foundation up to 5m deep. Indicative combined footprint of ancillary buildings = 400m <sup>2</sup> , located on a hardstanding foundation 2m deep. Situated on inferred previously undeveloped land - 98% of excavated soil assumed to be re-used; 2% assumed to require landfill disposal.
Satellite Substations – Foundation Excavations	3,100	2 no. satellite substations, each with a footprint of 130m x 90m, located on a hardstanding foundation up to 5m deep. Indicative combined footprint of ancillary buildings = 400 m <sup>2</sup> per substation, located on a hardstanding foundation 2m deep. Situated on inferred previously undeveloped land - 98% of excavated soil assumed to be re-used; 2% assumed to require landfill disposal.

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Construction Element	Anticipated Volume of Waste Soil (m <sup>3</sup> )	Assumptions
Electrical Cables – Trenching	1,900	Maximum 1.2m depth, 1.0m width. Total length of Cable Corridors approximately 20km. Majority situated on inferred previously undeveloped land; some areas of mapped infilled ground, quarries etc. (~900m of route): 94% of excavated soil assumed to be re-used; 6% assumed to require landfill disposal.
HDD – Launch Pit Excavations	300	Up to 39 no. launch pits anticipated for HDD crossings of watercourses, road etc., each measuring 10m x 5m x 3m deep. Situated on inferred previously undeveloped - 98% of excavated soil assumed to be re-used; 2% assumed to require landfill disposal.
Access, Drainage and Laydown	3,600	Soil strip of 300mm in areas of access roads, assumed total length is no more than that of the Cable Corridor, i.e. approximately 20km, same assumption on land use / suitability for re-use as Cable Corridors (i.e. 6% assumed to require landfill disposal)( Construction compounds/laydown areas (25 no., each with footprint between 2,500m <sup>2</sup> and 10,000m <sup>2</sup> and . excavations for Sustainable Drainage Systems (SuDS) (3no. each with footprint between 5,000m <sup>2</sup> and 13,000m <sup>2</sup> and up to 1.5m deep), situated on inferred previously undeveloped land - 98% of excavated soil assumed to be re-used; 2% assumed to require landfill disposal.
TOTAL	13,750	
<p><b>General Assumptions:</b> A bulking factor of 1.3 is assumed for excavated soil (included in volumes above). Of the soil considered unsuitable for re-use, it is assumed that 90% is non-hazardous (e.g. geotechnically unsuitable, Made Ground) and 10% is hazardous (e.g. based on the presence of contamination).</p>		

### General Construction Waste

16.2.57 Other (non-soil) construction waste types will be generated in smaller quantities, with the majority of this waste expected to be amenable to recycling (e.g. aggregates, metal, timber, plastic, cardboard). Waste management options/routes for waste streams generated during construction of the Proposed Development will be set out in a Site Waste Management Plan (SWMP). An outline SWMP (oSWMP) is provided within the **oCEMP [EN0110020/APP/5.9]**.

16.2.58 In the absence of site-specific data, the quantities of general (i.e. non-soil) construction waste have been estimated using average composition data published by WRAP and Smartwaste Waste Benchmark Data<sup>28</sup> to provide an estimate of the total volume of construction wastes requiring disposal to landfill, as shown in **Table 16.8**.

**Table 16.8 Waste Benchmark Data for Civil Engineering and Industrial Buildings**

	Average m <sup>3</sup> of Construction Waste per 100 m <sup>2</sup> of Development Footprint <sup>28</sup>
Civil Engineering	24.3
Industrial Buildings	20.0

16.2.59 Based on current design information, the total footprint for all proposed permanent development is anticipated to be approximately 81,000m<sup>2</sup>. Construction within this footprint includes industrial buildings / structures as well as civil engineering works, and therefore an average value of 22.15m<sup>3</sup> / 100m<sup>2</sup> is applied (based on **Table 16.8**, above). Using the footprint area alongside the benchmark for waste generation data, the total volume of waste generated during construction is anticipated to be approximately 18,000m<sup>3</sup>.

16.2.60 According to available data published by the UK government (2022 data)<sup>29</sup>, approximately 6% of non-soil wastes are disposed to landfill from a typical construction project. On this basis, as a reasonable worst-case scenario, it is assumed that up to 10% of non-soil construction wastes from the Proposed Development will require landfill disposal, equivalent to approximately 1,800m<sup>3</sup>, being classified as 50% non-hazardous and 50% hazardous waste.

### Operation and Maintenance

16.2.61 Wastes arising during operation and maintenance will be minimal and significantly less in volume than those during construction. Day to day operation of the Proposed Development will not generate any waste. As described in the ‘Scope of Assessment’ section, above, waste generated during the operational phase will be limited to maintenance and replacement of components, as required. The majority of waste generated is anticipated to be amenable to recycling but may include materials that require specialist treatment and disposal, such as components of equipment which are classified as hazardous waste.

16.2.62 Surplus soil waste may also be generated from occasional operational phase maintenance activities involving ground disturbance. However, these volumes are expected to be negligible and are not quantifiable due to their sporadic nature. Waste plant matter may be generated by vegetation clearance activities. This is also expected to be negligible in volume, sporadic in nature and entirely compostable.

16.2.63 Operational wastes will be handled in accordance with relevant guidance and legislation, including the Special Waste Regulations 1996<sup>11</sup>.

16.2.64 Waste types generated by operation of and maintenance activities associated with the Proposed Development which are anticipated to require landfill disposal are summarised in **Table 16.9**, below, based on existing similar developments.

**Table 16.9 Design Parameters – Operation and Maintenance Wastes Requiring Landfill Disposal**

	Assumptions	Anticipated Volume (m <sup>3</sup> )
Inert Waste	None anticipated. Possible surplus soil from occasional operational phase maintenance activities involving ground disturbance, but expected to be negligible and are not quantifiable due to their sporadic nature	Zero
Non-Hazardous Waste	Estimated <20 tonnes per year, including general waste from welfare facilities, some spent components, packaging etc. Approx. volume per tonne of mixed waste = 1.6m <sup>3</sup>	32m <sup>3</sup> per annum
Hazardous Waste	Estimated <5 tonnes per year, including spent components . Approx. volume per tonne of mixed waste = 1.6m <sup>3</sup>	8m <sup>3</sup> per annum

16.2.65 Assuming a consistent annual waste production rate over the 60 year lifespan of the Proposed Development, this would result in the following total operational phase waste volumes:

- Inert: Zero
- Non-hazardous: 1,920m<sup>3</sup>; and
- Hazardous: 480m<sup>3</sup>.

**Decommissioning**

16.2.66 Decommissioning will take place after an anticipated 60 years of operation and will consider the legal requirements at the time and be undertaken in accordance with a Decommissioning Environmental Management Plan (DEMP) approved by the relevant regulatory authority. An **outline Decommissioning Environmental Management Plan (oDEMP) [EN0110020/APP/5.11]** has been submitted as part of this Application. Application of the waste management hierarchy will be at the core of the future DEMP; any material assets will be recycled where practicable to do so.

16.2.67 Decommissioning phases wastes are likely to be largely made up of building materials (concrete, metal, electrical cables etc.) which are readily recycled. The majority of PV panel components are already recyclable, and the proportion recyclable is anticipated to near 100% by the time of decommissioning. Some special wastes) will also be generated, which will be managed in line with relevant regulations at the time of decommissioning.

**Assumptions, Exclusions and Limitations**

16.2.68 The anticipated volumes of waste generated during construction, operation and maintenance of the Proposed Development presented above are reasonable worst-case estimates based on currently available design information. The true volumes of waste generated are expected to be lower than the estimates presented, and the proportional split of waste types generated may vary within,

and across, different design scenarios. Furthermore, this assessment conservatively assumes that all waste requiring offsite disposal is sent to landfill.

16.2.69 The results of the assessment of effects presented herein is therefore considered to be a worst-case scenario.

### Baseline

#### Data Sources

##### Existing Baseline Data Sources

16.2.70 Existing baseline conditions within the Study Area in relation to waste have been defined using publicly available data from the Environment Agency, including:

- Waste Data Interrogator (2024)<sup>30</sup>
- 2024 Remaining Landfill Capacity<sup>31</sup>; and
- Waste Summary Tables (2024)<sup>32</sup>.

16.2.71 In addition, the baseline conditions within the Order Limits are defined based on the existing setting and current and historical land use, which may affect the nature of surplus (waste) soil generated by the Proposed Development, particularly during construction.

##### Future Baseline Data Sources

16.2.72 In the absence of the Proposed Development, at a regional scale, waste will continue to be generated from the construction of other new developments and general economic activity. As part of their Waste Plans<sup>22,23</sup>, the Local Planning Authorities have committed to sustainable waste management policies and strategies to deliver sufficient waste management capacity. Therefore, regional capacity to handle waste is anticipated to remain essentially unchanged and no different future baseline conditions within the Study Area have been defined in relation to waste.

#### Existing Baseline Conditions

16.2.73 The following sections establish the remaining landfill capacity of registered landfills in the Yorkshire and Humber and East Midlands planning regions, as well as the existing annual volume of waste materials disposed to landfill and trends in landfill void capacity. This information provides a baseline against which to assess the effects of construction and operation of the Proposed Development on the available landfill capacity. Baseline waste conditions have been determined based on publicly available data from the Environment Agency<sup>30,31,32</sup>, accessed on 18 February 2026.

16.2.74 In addition, the nature of surplus (waste) soil which will be generated during construction is intrinsically linked to the potential for ground contamination and the geotechnical properties of the soil at the Proposed Development. Therefore, baseline information on the setting and current and historical land use of the Order Limits has been obtained by reference to data sources identified in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]** and **ES Volume 3, Appendix 9.7-9.9: Phase 1 Contaminated Land Reports (W1-W3) [EN0110020/APP/6.20]**.

**Regional Landfilling and Waste Management**

16.2.75 **Table 16.10, Table 16.11** and **Table 16.12**, below, summarise the number of operational landfill facilities, the tonnage of waste sent to landfill and available landfill capacity in the Yorkshire and Humber and East Midlands planning regions in 2024, respectively, based on the Environment Agency’s most recently published data<sup>30,31,32</sup>.

**Table 16.10: Regional Operational Waste Facilities by Sub-Region (2024)**

Planning Region:	Yorkshire and Humber				East Midlands				
Sub-Region:	Humber	North Yorkshire	South Yorkshire	West Yorkshire	Derbyshire	Leicestershire	Lincolnshire	Northamptonshire	Nottinghamshire
Number of operational landfills	12	8	5	12	4	7	9	10	6
<b>TOTAL</b>	<b>37</b>				<b>36</b>				

**Table 16.11: Tonnage (,000 tonnes) of Waste Sent to Landfill by Sub-Region (2024)**

Planning Region	Sub-Region	Inert	Non-Hazardous	Non-Hazardous (SNRHW*)	Hazardous	TOTAL
Yorkshire and Humber	Humber	311	542	-	23	876
	North Yorkshire	129	325	-	-	453
	South Yorkshire	25	542	-	-	568
	West Yorkshire	275	460	156	100	991
	<b>TOTAL</b>	<b>740</b>	<b>1,870</b>	<b>156</b>	<b>123</b>	<b>2,889</b>
East Midlands	Derbyshire	53	115	615	-	783
	Leicestershire	317	1	187	-	504
	Lincolnshire	52	546	-	-	598
	Northamptonshire	758	136	-	220	1,115
	Nottinghamshire	236	143	-	-	378
	<b>TOTAL</b>	<b>1,416</b>	<b>940</b>	<b>801</b>	<b>220</b>	<b>3,377</b>

\* SNRHW - Stable, non-reactive, hazardous waste

**Table 16.12: Remaining Regional Landfill Capacity (,000m<sup>3</sup>) by Sub-Region (end 2024)**

Planning Region	Sub-Region	Inert	Non-Hazardous	Non-Hazardous (SNRHW*)	Hazardous	TOTAL
Yorkshire and Humber	Humber	3,668	16,574	1,243	450	21,935
	North Yorkshire	1,197	17,839	-	-	19,035
	South Yorkshire	6,334	3,019	-	-	9,353
	West Yorkshire	3,189	200	-	-	3,389
	TOTAL	14,387	37,631	1,243	450	53,712
East Midlands	Derbyshire	24	3,047	3,517	-	6,588
	Leicestershire	12,203	20	10,252	-	22,474
	Lincolnshire	1,487	7,965	-	-	9,452
	Northamptonshire	2,316	-	1,335	1,783	5,434
	Nottinghamshire	3,199	4,486	-	-	7,685
	TOTAL	19,228	15,518	15,104	1,783	51,634

\* SNRHW - Stable, non-reactive, hazardous waste

16.2.76 There are 73 active landfill facilities located within the Yorkshire and Humber and East Midlands planning regions. Of those, nine are located within the sub-regions in which the Proposed Development is located (i.e. South Yorkshire and Derbyshire). These facilities are listed in **Table 16.13**, below.

**Table 16.13: Active Landfill Facilities in South Yorkshire and Derbyshire Sub-Regions**

Facility Address	Planning Region	Planning Sub-Region	District	Site Type
Oxbow Lake Landfill, Aldwarke Lane, Rotherham, S60 1DW	Yorkshire and Humber	South Yorkshire	Rotherham	L04: Non-Hazardous
Thurcroft Landfill, Kingsforth Lane, Thurcroft, S66 9AB	Yorkshire and Humber	South Yorkshire	Rotherham	L04: Non-Hazardous
Hazel Lane Quarry Landfill, Hazel Lane, Hampole, DN6 7EX	Yorkshire and Humber	South Yorkshire	Doncaster	L04: Non-Hazardous
Tinsley Park Landfill, Outokumpu Stainless, Shepcote Lane, Sheffield, S9 1TR	Yorkshire and Humber	South Yorkshire	Sheffield	L07: Restricted
Harrycroft Quarry Landfill, South Anston, Worksop, S81 8BD	Yorkshire and Humber	South Yorkshire	Rotherham	L05: Inert

Facility Address	Planning Region	Planning Sub-Region	District	Site Type
Shardlow Quarry Landfill, Acre Lane, Shardlow, DE72 2SP	East Midlands	Derbyshire	South Derbyshire	L04: Non-Hazardous
Slinter Top Landfill Site, Slinter Mining Co., Cromford, DE4 3QU	East Midlands	Derbyshire	Derbyshire Dales	L05: Inert
Erin Landfill, Markham Lane, Duckmanton, S44 5HS	East Midlands	Derbyshire	Chesterfield	L02: Non-Hazardous (SNRHW)
Arden Quarry Landfill, Ovenhill Road, Birch Vale, SK22 1BY	East Midlands	Derbyshire	High Peak	L04: Non-Hazardous

### National Hazardous Waste Landfill Capacity

16.2.77 In line with ISEP guidance<sup>27</sup>, it may be appropriate to assess hazardous waste volumes in the context of available landfill void capacity at a national level.

16.2.78 Based on Environment Agency data<sup>32</sup>, the total void capacity in active, licensed hazardous waste landfills in England at the end of 2024 was 9,848,250m<sup>3</sup>.

### Order Limits Setting and Land Quality

#### Soils

16.2.79 Detailed descriptions of the soil types present at the Proposed Development are provided in **ES Volume 2, Chapter 9, Ground Conditions and Land Quality [EN0110020/APP/6.9]** and can be summarised as follows.

- The vast majority of soils at the Proposed Development are natural topsoils and subsoils
- Based on Agricultural Land Classification (ALC) surveys, the majority of soils surveyed, agricultural areas comprise Subgrade 3b and Subgrade 4 soils (not considered ‘Best and Most Versatile’); and
- In previously developed areas, such as roads, railway lines, historical mining features, quarries and landfills, Made Ground is anticipated to be present. The composition and thickness of Made Ground is unknown.

#### Land Use

16.2.80 Current land use at the Site is predominantly agricultural. Notable land uses which have the potential to affect (waste) soil quality within each area of the Proposed Development are described below:

- W1: Historical railway line, historical mining activities (including potentially infilled shafts), identified areas of potentially infilled land and isolated current agricultural and commercial properties
- W2: The M1 motorway, wind farm development, historical mining activities (including surface coal mining and backfilling), historical railway line and historic landfills

- W3: The M1 motorway, historical mining activities (including surface coal mining and backfilling and potentially infilled shafts), former quarry and claypit (potentially infilled); and
- Cable Corridor: Current and historical railway lines, small areas of industrial land (Maltby Industrial Estate), registered and historic landfills, former railway lines and quarries/pits (potentially infilled).

16.2.81 Further details of current and historical land uses are provided in **ES Volume 2, Chapter 9, Ground Conditions and Land Quality [EN0110020/APP/6.9]** and **ES Volume 3, Appendix 9.7-9.9 Phase 1 Contaminated Land Reports [EN0110020/APP/6.20]**.

### *Potential Sources of Contamination*

16.2.82 As discussed in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]**, in areas of previously undeveloped land, including farmland, where only natural soils are present and no potentially Significant sources of contamination have been identified, the potential for widespread and / or gross soil contamination to be present is low.

16.2.83 However, in localised parts of the Site, excavations will be required on land which has been previously developed. In these locations, potential soil contamination, and/or Made Ground is likely to be present.

16.2.84 In addition, **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]** and **ES Volume 3, Appendix 9.7-9.9: Phase 1 Contaminated Land Reports [EN0110020/APP/6.20]** identified potential offsite sources of contamination in the wider Study Area which have the potential to impact soils at the Site, including historical landfills, quarries, sewage works, brick works and unspecified depots / work buildings.

## **Future Baseline Conditions**

16.2.85 In order to assess the sensitivity of landfill capacity as a receptor, the trend in available void space over time needs to be considered.

16.2.86 Based on available Environment Agency data<sup>32</sup>, total landfill capacity in the Yorkshire and Humber and East Midlands planning region in the last ten years (2015 – 2024), total landfill capacity in the Yorkshire and Humber and East Midlands regions has decreased by approximately 32%, and nationally (England) has decreased by approximately 36%. Therefore, in the absence of available forecast data, a reasonable worst-case scenario is assumed whereby the regional and national landfill capacity continues to decrease during the lifetime of the Proposed Development.

16.2.87 However, it is noted that the Local Planning Authorities have committed to sustainable waste management policies and strategies to deliver sufficient waste management capacity<sup>22, 23</sup>.

16.2.88 Since land quality and the potential for contamination are relevant to generation of surplus soil during the construction phase only, no future baseline applies to this aspect of the waste assessment.

## **Embedded Mitigation**

16.2.89 This section outlines specific mitigation measures relevant to waste which have been identified and have been considered as part of the assessment.

- 16.2.90 The Proposed Development is committed to the implementation of measures to mitigate impacts that could lead to Significant Adverse effects in relation to waste generation and management. This includes mitigation that is embedded into the design of the Proposed Development and compliance with all relevant waste legislation in relation to waste handling, storage, transport, and disposal, as well as best practice mitigation measures that the Proposed Development is committed to adopting during construction, operation (including maintenance), and decommissioning.
- 16.2.91 The following subsections describe the mitigation measures for each phase of the Proposed Development and the mechanisms for securing these measures.
- 16.2.92 The assessment of effects reported in paragraphs 16.2.109 to 16.2.126 takes into account adoption of these embedded mitigation measures in full.

### Construction

#### Waste Management and Minimisation Measures

- 16.2.93 Prior to construction of the Proposed Development, the contractor will be required to develop a construction SWMP to be implemented during the construction phase of the Proposed Development. The SWMP will form part of the CEMP, to be approved by the relevant Local Planning Authorities (LPA) prior to commencement of the main construction phase. The construction SWMP will demonstrate application of the DoW:CoP, as well as the employment of a SMP (where surplus soil is to be re-used onsite) and/or an MMP (where surplus soil is proposed to be re-used offsite). An oCEMP, including oSWMP and outline SMP, are provided in the **oCEMP [EN0110020/APP/5.9]**.
- 16.2.94 The disposal of waste, including any surplus soil, will be managed so far as is reasonably practicable to maximise the environmental and development benefits from the use of surplus material and reduce any adverse environmental effects of disposal in accordance with the relevant waste management regulations. Liquid waste (i.e. wastewater from surface water runoff, dewatering of excavations etc.) will be managed via the oCEMP, as described in **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.
- 16.2.95 Waste minimisation actions relating to the Proposed Development that are anticipated to be implemented, where possible during the construction phase via the construction SWMP and CEMP include:
- Agreements with material suppliers to reduce the amount of packaging or to participate in a packaging take-back scheme
  - Implementation of a 'just-in-time' material delivery system to avoid materials being stockpiled, which increases the risk of their damage and disposal as waste
  - Attention to material quantity requirements to avoid over-ordering and generation of waste materials
  - Re-use of materials (e.g. excavated soil) where feasible
  - Segregation of waste at source where practical; and
  - Re-use and recycling of materials offsite where re-use onsite is not practical (e.g. through use of an offsite waste segregation facility and re-sale for direct re-use or re-processing).

### **Actions for Dealing with Waste**

16.2.96 Further actions will be introduced as part of the construction SWMP which will contribute to the general reduction of waste generation at the Site and manage risks associated with waste handling, storage and disposal. These measures include:

- Appointment of an environmental co-ordinator (or similar) who will hold overall responsibility for waste management. The role will include co-ordinating all waste or environmental issues associated with construction of the Proposed Development from compiling waste data to identifying training needs. Construction sites with an environmental co-ordinator tend to perform better in managing waste
- Maintaining a good standard of housekeeping, including designated waste storage areas, segregation of different waste streams, signposting and labelling and covering of skips to prevent wind-blown waste. Regular inspections will be undertaken to ensure waste storage areas are kept tidy
- Accurate record-keeping of waste types, volumes and disposal routes and destinations
- Implementation of staff awareness training to ensure all personnel are aware of the correct procedures onsite for waste segregation, disposal and to actively promote recycling onsite through clear signage
- Development of targets and Key Performance Indicators (KPIs) for waste recycling and reduction; and
- Implementation of a suitable management structure which will allow prompt decision making relating to improvements in waste management and recycling initiatives.

### **Indicative Roles and Responsibilities**

16.2.97 Personnel at all levels have a role in managing materials and waste correctly, however typical roles and responsibilities that are likely to be defined as part of the construction SWMP include:

- Site Manager:
  - Responsible for ensuring a system is implemented that identifies and manages the waste being produced
  - Implements a waste plan as a 'live' document, identifying an appropriate strategy and KPIs; and
  - Co-ordinates waste management on Site.
- Site Waste Management Representative:
  - Co-ordinates the identification of materials for re-use or recycling and identify opportunities for waste reduction
  - Co-ordinates staff training
  - Ensures that all waste storage containers are accurately labelled to show all Site workers where to deposit specific materials; and
  - Liaises with the management team to ensure the appropriate management of incoming materials, the establishing of waste management contracts, and the provision of receptacles.

- All Site Personnel:
  - Ensure no over-ordering of materials to reduce the amount of waste produced
  - Correct handling and storage of materials to prevent damage and wastage
  - Co-ordinate with the Site team the reuse or recycling of materials for alternative usage where possible
  - Correct handling of waste materials by containment, separation and storage
  - Labelling of waste storage containers to show where to deposit specific materials
  - Ensure containers are stored safely and securely; and
  - Disposal of waste to appropriately licensed Site with correct documentation completed.

### **Waste Monitoring, Audits and Review**

16.2.98 Monitoring of waste and waste management plans ensures that waste minimisation obligations, as detailed within the construction SWMP, are being met and helps to identify opportunities for improvements and potential cost reductions.

16.2.99 Typical monitoring, audit and review activities will be defined within the construction SWMP and will include:

- Waste Monitoring: Update the construction Waste Management Plan (WMP) at regular intervals throughout the construction phase to illustrate changes in the Proposed Development such as waste types, volumes, sub-contractors and changes in personnel and to drive continual improvement in promoting management of wastes as high up the waste hierarchy as possible, as follows:
  - Ensure all legislation and regulations are being complied with and that the waste management strategy is being implemented appropriately, monitored through regular inspections
  - Completion of logs detailing the volume of material brought onto Site and the volume of waste generated including the type and the route of disposal/ recovery; and
  - Collation of data into a report detailing all waste movements for submission to the Site Manager to be utilised during the annual waste audit and waste review.
- Waste Audit: Collate / review baseline information. This will include, for example reviews of:
  - Operations/ staffing levels, composition, waste monitoring reports and quantity of waste generated
  - Current waste management procedures
  - Existing activities including, for example, key roles and responsibilities
  - An estimation of waste volumes including a comparison from previous and projected years (where appropriate); and
  - The results of the waste audit will be used to inform the waste review.

- **Waste Review:** A waste review will be undertaken following the completion of a waste audit and the completion of regular waste monitoring. The review will:
  - Provide an opportunity to consider the suitability of the management strategies that are in place in relation to relevant regulations and best practice procedures
  - Areas for improvement, lessons to be learnt and potential improved cost savings and sustainability; and
  - Review monthly, quarterly and annual reports, compare waste related data that has been collected and include guidance and proposals to drive continual improvement.

### Operation and Maintenance

#### Waste Management and Minimisation Measures

- 16.2.100 The Proposed Development is being designed in accordance with Best Available Techniques (BAT<sup>33</sup>), such that the generation of solid wastes during operation is minimised or avoided altogether (where possible). Occasional special solid wastes which require replacement, cannot be avoided but are anticipated to be produced on a sporadic basis only (see **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**).
- 16.2.101 The framework for waste management during the operational phase of the Proposed Development, including handling of special wastes, will be included within the Proposed Development's Environmental Management System (EMS) relevant details of which will be in the Operational Environmental Management Plan (OEMP). An **outline Operational Environmental Management Plan (oOEMP) [EN0110020/APP/5.10]** has been submitted as part of this Application.
- 16.2.102 The disposal of operational waste will be managed so far as is reasonably practicable to reduce any adverse environmental effects of disposal in accordance with the relevant waste management regulations, as will be outlined in the future EMS.
- 16.2.103 Waste minimisation actions relating to Site generated waste that are anticipated to be implemented during the operational and maintenance phase include the following:
- Waste minimisation, by using less new resources and materials where practicable
  - Segregation of waste to maximise recycling
  - Recycling of hazardous wastes where possible, for example used desiccant (silica gel); and
  - Diversion of waste, using a specialist waste management company.

#### Actions for Dealing with Waste

- 16.2.104 As with the construction phase, further measures will be employed during the operational phase to contribute to the general reduction of waste generation and manage risks associated with waste handling, storage and disposal. These will be detailed in the EMS and will include equivalent measures to those detailed in paragraph 16.2.96 (construction phase), above.

### Indicative Roles and Responsibilities

- 16.2.105 Personnel at all levels have a role in managing materials and waste correctly. Roles and responsibilities will be defined in the EMS and will include equivalent roles and responsibilities to those detailed in paragraph 16.2.97 (construction phase), above.

### Waste Monitoring, Audits and Review

- 16.2.106 Monitoring and review of waste and waste management plans ensure that waste minimisation obligations, as detailed within the EMS, are being achieved and help to identify opportunities for improvements, as well as to drive continual improvement in promoting management of wastes as high up the waste hierarchy as possible.
- 16.2.107 Waste monitoring, audit and review activities will be defined within the EMS and will include equivalent activities to those detailed in paragraphs 16.2.98 and 16.2.99 (construction phase), above. The frequency of waste monitoring, audits and reviews will be specified in the EMS.

### Decommissioning

- 16.2.108 A Decommissioning Plan (including a DEMP) will be prepared at the cessation of operations at the Site, in line with relevant legislation at that time. An Outline Decommissioning Plan is provided in the **oDEMP [EN0110020/APP/5.11]**. The DEMP will outline the potential environmental effects associated with decommissioning and site closure/ restoration, and detail appropriate management and mitigation measures, anticipated to be generally in line with those described for the construction and operation and maintenance phases of the Proposed Development, above.

### Assessment of Effects

- 16.2.109 The following sections present the assessment of effects of waste generated by the Proposed Development on landfill capacity. Potential direct and indirect effects of waste on other receptors, including soil and groundwater quality, surface water quality, traffic and transport and greenhouse gases and climate change, are considered in **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]**, **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**, **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]** and **ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]**, respectively.

### Construction

#### Landfill Capacity

- 16.2.110 Environment Agency data presented in **Table 16.12**, above, show the baseline available landfill capacity in the Yorkshire and Humber and East Midlands planning regions at the end of 2024 (most recent available data). Available capacity data for hazardous waste at a national scale is outlined in paragraph 16.2.78.

16.2.111 As described in paragraph 16.2.86, total landfill capacity in the Yorkshire and Humber and East Midlands regions, as well as England as a whole, has decreased by more than 30 % over the last ten years. Therefore, in the absence of available forecast future landfill void capacity data, the reasonable worst-case scenario is assumed whereby the decreasing trend continues during the construction phase of the Proposed Development. In line with ISEP guidance<sup>27</sup> and criteria presented in **Table 16.4**, receptor sensitivity is therefore assessed as 'Very High'. This is considered to be a reasonable worst-case assumption, since the Local Planning Authorities have committed to sustainable waste management policies and strategies to deliver sufficient waste management capacity in the region<sup>22,23</sup>.

16.2.112 The anticipated (reasonable worst-case) volumes and types of waste which will be generated during construction (as described in **Table 16.7** and in paragraph 16.2.60), have been compared to landfill capacity data to assess the magnitude of impact in line with ISEP guidance<sup>27</sup>, as shown in **Table 16.14**, below. Since the vast majority of the Proposed Development is located with the Yorkshire and Humber planning region, the assessment below conservatively considers the available landfill capacity in this region only. The assessment below takes into consideration the embedded mitigation described in paragraphs 16.2.93 - 16.2.99.

**Table 16.14: Evaluation of Magnitude of Impact of Construction Wastes Generated by the Proposed Development on Landfill Capacity**

	Inert	Non-Hazardous	Hazardous
Expected (worst-case) volume of construction-generated solid waste (soil and general construction waste) (m <sup>3</sup> )	Zero	14,300	2,400
1. Landfill capacity (Yorkshire and Humber region, 2024) (m <sup>3</sup> )	14,387,000	38,874,000	N/A
Percentage occupied by (worst-case) solid construction waste generated at the Site (inert and on-hazardous waste)	0 % (‘No change’ magnitude)	0.04% (‘Negligible’ magnitude)	N/A
2. Landfill capacity (England, 2024) (m <sup>3</sup> )	N/A	N/A	9,848,250
Percentage occupied by (worst-case) solid construction waste generated at Site (hazardous waste only)	N/A	N/A	0.02% (‘Negligible’ magnitude)
Embedded Mitigation	Full employment of the principles set out in the Waste Hierarchy. Engineering design to reduce the generation of excess soils and other wastes.		

	Procedures to be set out in the CEMP and supplementary plans (e.g. SWMP, MMP). See paragraphs 16.2.93 - 16.2.99
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16.2.113 By comparison of the assessed sensitivity ('Very High') and the magnitude of impacts (as set out in **Table 16.14**), the significance of effects in relation to waste generated during construction of the Proposed Development is assessed as:

- Inert: **Neutral (Not Significant)**
- Non-Hazardous: **Slight Adverse (Not Significant)**; and
- Hazardous: **Slight Adverse (Not Significant)**.

16.2.114 Overall, the effect of construction of the Proposed Development on landfill capacity, taking into account the proposed embedded mitigation and assuming a reasonable worst-case scenario, is assessed as **Not Significant**.

## Operation and Maintenance

### Landfill Capacity

16.2.115 As presented in **Table 16.9**, estimates of annual waste volumes which will be generated during the operational phase of the Proposed Development are as follows:

- Inert: Zero
- Non-hazardous: 32m<sup>3</sup>; and
- Hazardous: 8m<sup>3</sup>.

16.2.116 Assuming a consistent annual waste production rate over the 60 year lifespan of the Proposed Development, this would result in the following total operational phase waste volumes:

- Inert: Zero
- Non-hazardous: 1,920m<sup>3</sup>; and
- Hazardous: 480m<sup>3</sup>.

16.2.117 This is inferred to be a realistic worst-case estimate, since opportunities for recycling are likely to increase in the next 60 years in line with the UK's net zero emissions targets, resulting in a smaller proportion of waste requiring landfill disposal.

16.2.118 As for the construction phase, the reasonable worst-case scenario is assumed whereby the decreasing trend in regional and national landfill capacity continues during the lifetime of the Proposed Development. In line with ISEP guidance<sup>27</sup> and criteria presented in **Table 16.4**, receptor sensitivity is therefore assessed as 'Very High'.

16.2.119 The anticipated (reasonable worst-case) total waste volumes and types of waste which will be generated during operation (as described above), have been compared to landfill capacity data to assess the magnitude of impact in line with ISEP guidance<sup>27</sup>, as shown in **Table 16.15**. As above, since the vast majority of the Proposed Development is located with the Yorkshire and Humber planning region, the assessment below conservatively considers the available landfill capacity in this region only. The assessment below takes into consideration the embedded mitigation described in paragraphs 16.2.100 - 16.2.107.

**Table 16.15: Evaluation of Magnitude of Impact of Operational Phase Wastes Generated by the Proposed Development on Landfill Capacity**

	Inert	Non-Hazardous	Hazardous
Expected (worst-case) total volume of construction-generated solid waste (m <sup>3</sup> )	Zero	1,920	480
1. Landfill capacity (combined Yorkshire and Humber and East Midlands regions, 2024) (m <sup>3</sup> )	14,387,000	38,874,000	N/A
Percentage occupied by (worst-case) solid waste generated at the Site (inert and on-hazardous waste)	0 % (‘No change’ magnitude)	<0.01% (‘Negligible’ magnitude)	N/A
2. Landfill capacity (England, 2024) (m <sup>3</sup> )	N/A	N/A	9,848,250
Percentage occupied by (worst-case) solid waste generated at Site (hazardous waste only)	N/A	N/A	<0.01% (‘Negligible’ magnitude)
Mitigation	Full employment of the principles set out in the Waste Hierarchy. Employment of BAT. Principles and procedures to be set out in the EMS. See paragraphs 16.2.100 - 16.2.107.		

16.2.120 By comparison of the assessed sensitivity (‘Very High’) and the magnitude of impacts (as set out in **Table 16.16**), the significance of effects in relation to waste generated during construction of the Proposed Development is assessed as:

- Inert: **Neutral (Not Significant)**
- Non-Hazardous: **Slight Adverse (Not Significant)**; and
- Hazardous: **Slight Adverse (Not Significant)**.

16.2.121 Overall, the effect of operation and maintenance of the Proposed Development on landfill capacity, taking into account the proposed embedded mitigation and assuming a reasonable worst-case scenario, is assessed as **Not Significant**.

## Decommissioning

16.2.122 The potential effects of decommissioning on local landfill capacity are anticipated to be similar to, and less Significant than, the potential construction effects (see above).

16.2.123 Large volumes of inert material (including surplus soil) requiring landfill disposal are unlikely to be generated during the decommissioning phase. Furthermore, the majority of surface equipment will be amenable to recycling. Decommissioning will be undertaken in line with a DEMP, prepared prior to decommissioning activities starting.

16.2.124 Potential effects on landfill capacity from decommissioning activities are therefore anticipated to be **Not Significant**.

### **Additional Mitigation and Residual Effects**

#### **Additional Mitigation**

16.2.125 No additional mitigation is proposed in relation to waste, above that described as embedded mitigation, above.

#### **Residual Effects**

16.2.126 A summary of the potential residual effects in relation to waste, assuming a reasonable worst-case scenario, is presented in **Table 16.16**.

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**Table 16.16 Summary of Residual Effects**

Activity and Impact	Embedded Mitigation	Receptor	Sensitivity	Magnitude of Impact	Significance of Effect	Additional Mitigation	Significance of Residual Effect
Potential for waste generated by construction of the Proposed Development to exceed available landfill capacity	<ul style="list-style-type: none"> <li>oCEMP, including oSWMP / oSMP / MMP.</li> <li>Employment of the Waste Hierarchy.</li> <li>Waste minimisation embedded into engineering design.</li> </ul>	Regional and national (England) landfill capacity	Very High	Negligible	Slight Adverse (Not Significant)	N/A	Slight Adverse (Not Significant)
Potential for waste generated by operation and maintenance of the Proposed Development to exceed available landfill capacity	<ul style="list-style-type: none"> <li>oOEMP, including EMS.</li> <li>Employment of the Waste Hierarchy.</li> <li>Employment of BAT.</li> </ul>	Regional and national (England) landfill capacity	Very High	Negligible	Slight Adverse (Not Significant)	N/A	Slight Adverse (Not Significant)
Potential for waste generated by decommissioning of the Proposed Development to exceed available landfill capacity	<ul style="list-style-type: none"> <li>oDEMP.</li> <li>Employment of the Waste Hierarchy.</li> </ul>	Regional and national (England) landfill capacity	Very High	Negligible	Slight Adverse (Not Significant)	N/A	Slight Adverse (Not Significant)

## Cumulative Effects

16.2.127 This section assesses the potential cumulative waste effects of the Proposed Development. The methodology of this assessment is presented in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.2]**. Relevant guidance for waste EIAs<sup>27</sup> does not set out a prescribed approach for cumulative assessment in relation to waste.

### Intra-Cumulative Effects

16.2.128 Intra-cumulative impacts can be defined as those that occur where a single receptor is affected by more than one source of effect arising from different aspects of the project.

16.2.129 The primary receptor considered in the waste assessment, i.e. landfill capacity, will not be affected by other aspects of the Proposed Development. Therefore, no intra-cumulative effects are anticipated to arise.

### Inter-Cumulative Effects

16.2.130 Inter-project cumulative effects refer to the impacts that arise from other existing and, or approved developments within reasonable proximity of the Proposed Development, which individually might not be Significant, but when considered together could create a Significant cumulative effect on a shared receptor.

16.2.131 Generation of waste requiring landfill disposal by the Proposed Development combined with that from other developments has the potential to result in an increased burden on regional landfill capacity. It is not practicable to consider all other developments with the Study Area for waste (i.e. Yorkshire and the Humber and East Midlands planning regions). However, based on the very low waste volumes requiring landfill disposal that will be generated during all phases of the Proposed Development, and the outcome of the impact assessment of **Not Significant**, it is not anticipated to contribute to potentially Significant inter-cumulative effects with respect to waste.

## Summary

16.2.132 This Chapter has assessed the potential effects of the Proposed Development in relation to waste, i.e. potential effects on landfill capacity.

16.2.133 The largest volume of waste is anticipated to be generated during construction phase of the Proposed Development, including surplus soil. As described in the 'Basis of Assessment', a large proportion of excavated soils from construction (c.95%) is anticipated to be reused as part of the Proposed Development (e.g. for landscaping) or offsite (under an MMP). In addition, significant proportions of general construction wastes and operational phase wastes are anticipated to be amenable to recycling.

16.2.134 This assessment assumes the realistic worst-case scenario whereby landfill disposal is required for all wastes which are unsuitable for re-use or recycling.

16.2.135 Furthermore, the Proposed Development will implement the principles set out in the waste hierarchy throughout all phases, including implementation of a CEMP (including a SWMP, SMP and MMP, as appropriate) during construction

and an EMS during operation, which will maximise the re-use and recycling of materials and promote waste minimisation. These measures are anticipated to further reduce the amount of waste requiring landfill disposal compared to the realistic worst-case scenario assumed in this assessment.

- 16.2.136 A quantitative assessment against regional (inert and non-hazardous waste) and national (hazardous) landfill capacity has been undertaken in line with ISEP guidance, based on the current design parameters and taking into consideration the mitigation measures described in paragraphs 16.2.89 to 16.2.108. The significance of residual effects with respect to waste has been assessed as **Not Significant**.

### **Statement of Significance**

- 16.2.137 The significance of residual effects with respect to waste has been assessed as **Not Significant**.

## 16.3 Glint and Glare

- 16.3.1 This section is supported by **ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]** which presents the glint and glare analysis. Consideration of glare in relation to other likely significant effects is discussed in **ES Volume 2, Chapter 7: Landscape and Visual [EN0110020/APP/6.7]**.
- 16.3.2 Glint and Glare refers to the reflection of sunlight which may cause harm, discomfort or distraction to sensitive receptors. Glints are momentary flashes of bright light, whilst glare is a continuous source of bright light.

### Legislation, Policy, and Guidance

- 16.3.3 There is no relevant legislation to Glint and Glare specifically. Planning policy and guidance relating to Glint and Glare which is pertinent to the Proposed Development comprises of the documents listed below. More detailed information can be found in **ES Volume 3, Appendix 16.1: Legislation Policy and Guidance [EN0110020/APP/6.20]**. In summary it comprises of:

#### National Policy

- NPS for Renewable Energy Infrastructure (EN-3) 2023 (2025)<sup>34</sup>.

#### Guidance

- National Planning Practice Guidance – Renewable and Low Carbon Energy<sup>35</sup>;
- Interim Civil Aviation Authority (CAA) Guidance – Solar Photovoltaic Systems;
- BRE (2014). Planning Guidance for the Development of Large-Scale Ground Mounted Solar PV Systems;
- US Federal Aviation Administration (FAA) Guidance- (Interim Policy, FAA Review of Solar Energy System Projects on Federally Obligated Airports 2013); and
- Technical Guidance for Evaluating Selected Solar Technologies on Airports (2018)<sup>36</sup>.

#### Consultation

- 16.3.4 This section provides a summary of the consultation undertaken to date regarding the Proposed Development.

#### EIA Scoping

- 16.3.5 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025. The Scoping Report captures the findings of the scoping exercise and outlines the technical guidance, standards, best practices, and criteria to be applied in the assessment to identify

and evaluate the likely significant effects of the Proposed Development on Glint and Glare.

- 16.3.6 A Scoping Opinion was received from the Planning Inspectorate on 03 June 2025 (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).
- 16.3.7 **Table 16.17** summarises how this Chapter of the ES addresses key points from the EIA Scoping Opinion comments related to Glint and Glare.

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**Table 16.17: Scoping Opinion Comments and How They Are Addressed in This ES**

Consultee	Issue Raised	How This is Addressed	Where This is Addressed in the ES
<i>The Planning Inspectorate</i>	<p><b>ID 3.11.1: Glint and Glare Effects During Construction and Decommissioning</b></p> <p><i>“The Inspectorate agrees that this matter can be scoped out on the basis that the effects would only be anticipated during operation.”</i></p>	Impacts from Glint and Glare during the construction and decommissioning phases have been scoped out of the assessment on the basis that the impacts would only be anticipated during operation.	Paragraph 16.3.8
<i>The Planning Inspectorate</i>	<p><b>ID 3.11.2: Glint and Glare During Operation</b></p> <p><i>“The Scoping Report proposes that a glint and glare technical assessment will inform an assessment of LSE in the LVIA Chapter. The Scoping Report states that potential impacts will also be considered for trains and aviation, but it is unclear whether these receptors will be assessed in the LVIA chapter or another chapter.”</i></p>	Potential impacts of Glint and Glare on trains and aviation as receptors has been assessed in <b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b> .	<b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b>
<i>The Planning Inspectorate</i>	<p>ID 3.11.2: <i>“The Inspectorate agrees with the approach of submitting a technical assessment rather than having a separate chapter assessment however, the technical assessment should cross reference to where the LSE on identified receptors are assessed in the ES. This should at least include transport receptors, cultural heritage and</i></p>	<b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b> has identified potential receptors and potential impact of Glint and Glare from the Proposed Development. This is then considered in the assessment of likely significant effect on receptors in <b>ES Volume 2, Chapter 7: Landscape and Visual [EN0110020/APP/6.7]</b> .	<b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b> ; and <b>ES Volume 2, Chapter 7: Landscape and Visual [EN0110020/APP/6.7]</b> .

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Consultee	Issue Raised	How This is Addressed	Where This is Addressed in the ES
	<i>landscape and visual receptors where significant effects are likely to occur.”</i>		
National Highways	<i>National Highways consider that a Glint and Glare Assessment should be produced as part of the Application. When considering glint and glare, the following information should be provided within each application: Outline of the Site context, including location, proximity to the SRN and topography, and Outline of proposal details, including scale, site boundary, site map, mounting arrangements and orientation.</i>	<b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b> has identified potential receptors and potential impact of Glint and Glare from the Proposed Development, and provides the information relevant to the assessment of Glint and Glare.	<b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b>
Thrybergh Parish Council	<i>Glint and glare should not be scoped out of commissioning and decommissioning as the handling of the panels will create this issue</i>	A glint and glare assessment has been undertaken for the operational phase of the Proposed Development, as this represents the only stage during which the solar PV array will be fully installed across the Site. This approach ensures that the assessment captures the worst-case scenario in terms of potential reflective impacts. The findings of the assessment, along with any embedded mitigation measures, are designed to minimise or eliminate potential glint and glare effects on identified receptors. These measures will also serve to reduce	<b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b>

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<b>Consultee</b>	<b>Issue Raised</b>	<b>How This is Addressed</b>	<b>Where This is Addressed in the ES</b>
		any residual impacts that may arise during the construction and decommissioning phases, when solar panels may be temporarily handled or partially installed, but the array will not be present in its entirety.	

### Issues Scoped Out of Assessment

- 16.3.8 Impacts from Glint and Glare during the construction and decommissioning phases have been scoped out of the assessment on the basis that the impacts would only be anticipated during operation. The Planning Inspectorate have agreed, in the Scoping Opinion, to this being scoped out.

### Statutory Consultation

- 16.3.9 A Statutory Consultation period was held between 16 September and 28 October 2025 in line with Section 47 of the Planning Act 2008. Feedback was sought from the local community and a range of consultee bodies based on the preliminary information and assessments presented in the Draft Environmental Statement (Draft ES).
- 16.3.10 **Table 16.18** presents feedback from statutory consultees given at Statutory Consultation, and how this is addressed in this ES.

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Table 16.18 Statutory Consultation Feedback from the Statutory Consultation Period

Consultee	Consultee Feedback	How This is Addressed	Where This is Addressed in the ES
National Highway	<p>5.2 A Glint and Glare Assessment Report is provided as Appendix 16.2 to the Draft ES. The assessment identifies that (with screening considered) roadside vegetation, topography and proposed mitigation planting will significantly reduce visibility of panels from most stretches of the motorway; nevertheless, short sections of the M1 and M18 will still have potential visibility of panels causing glare and thus have a 'high impact' rating.</p> <p>5.3 Paragraph 16.2.322 of the Glint and Glare Assessment Report states that updates will be made to the proposed landscape mitigation in order to "reduce the potential impact of glint and glare to as low practicably possible. Therefore, the magnitude of impact on receptors is expected to be reduced, and this updated mitigation and assessment will be presented in the ES". JSJV welcomes the commitment to further assessment and mitigation and notes that National Highways will need to review the updated assessments when provided with the final ES.</p>	<p>Screening has been proposed to reduce glare impacts on road receptors that are considered 'high' or 'medium' impacts. As a result, all road receptors assessed have been reduced to 'Low' or 'None' in relation to glare impacts. Further details can be found within <b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b></p>	<p><b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b></p>
Doncaster City Council	<p>Information should be included on how pedestrians, cyclists, equestrians and all road users could be affected and what mitigation is to be put in place to address these impacts</p>	<p>The glint and glare assessment has assessed both Public Rights of Way (PRoW) and Road receptors within the Baseline Conditions and Impact Assessment sections. No Significant impacts have been found for PRoW users and mitigation has been put in place to make sure there are no Significant impacts to road users.</p>	<p><b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b></p>

## Targeted Consultation

- 16.3.11 A Targeted Consultation period was held between 4 March and 3 April 2026 on proposed changes to the Order Limits. This included notifying relevant prescribed consultees. Feedback from this Targeted Consultation and the Applicant's response is included in the **Consultation Report [EN0110020/APP/5.1]**.
- 16.3.12 A second Targeted Consultation was held for any individuals that had been identified as land interests after the Statutory Consultation.
- 16.3.13 National Highways were engaged in relation to glint and glare screening required along a small number of roads and feedback was received in relation to the location and feasibility of the screening which has been considered in this assessment. Engagement with National Highways will continue post consent during detailed design.

## Glint and Glare Assessment

- 16.3.14 All information in relation to assessment methodology, baseline conditions, impact assessment, mitigation, residual impacts, cumulative effects and conclusions on the assessment of glint and glare from the Proposed Development is provided in detail in **ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020 /APP/6.20]**.

## 16.4 Telecommunications and Utilities

- 16.4.1 Given the relatively low height of the panels and other project infrastructure, the Proposed Development will not interfere with above ground telecommunications and utilities infrastructure. As a result, no effects on above ground telecommunications and utilities infrastructure are anticipated during the construction, operation and maintenance, and decommissioning phases of the Proposed Development.
- 16.4.2 However, there is the potential for underground utilities to be adversely impacted by the Proposed Development specifically throughout the construction and decommissioning phases. Standard practice involves consulting with relevant utilities and telecommunications providers such as those for water, waste water, gas and electricity to identify any existing infrastructure constraints.
- 16.4.3 Details of this consultation and how the design and embedded mitigation measures of the Proposed Development incorporate necessary protective measures to safeguard any existing infrastructure which may be impacted by the Proposed Development are presented in this Section.

### Legislation, Policy and Guidance

- 16.4.4 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 2017<sup>37</sup>. However, given the nature of solar farm developments, there may be potential for the Proposed Development to affect existing utility infrastructure above and / or below ground.
- 16.4.5 There is no other legislation, policy or guidance specifically related to the Telecommunications and Utilities assessment.

### Consultation

- 16.4.6 This section provides a summary of the consultation undertaken to date regarding the Proposed Development.

### EIA Scoping

- 16.4.7 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025. The Scoping Report captures the findings of the scoping exercise and outlines the technical guidance, standards, best practices, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Proposed Development on Telecommunications and Utilities.
- 16.4.8 A Scoping Opinion was received from the Planning Inspectorate on 3 June 2025 (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).
- 16.4.9 **Table 16.19** summarises how this Chapter of the ES addresses key points from the EIA Scoping Opinion comments related to Telecommunications and Utilities.

**Table 16.19 Scoping Opinion Comments and How They Are Addressed in This ES**

Consultee	Issue Raised	How This is Addressed	Where This is Addressed in the ES
<i>The Planning Inspectorate</i>	<b>ID 3.11.4 Telecommunications and Utilities</b> <i>“The Inspectorate agrees that this matter may be scoped out on the basis the ES demonstrates that the design has appropriately safeguarded telecommunications and utilities infrastructure providing evidence of agreement with the relevant consultees.”</i>	<b>ES Volume 1, Chapter 5 The Proposed Development [EN0110020/AP/P6.5]</b> provides a description of the Proposed Development, and the measures applied to safeguard telecommunications and utilities infrastructure. Further details of the safeguarding measures applied to the Proposed Development’s design are included within <b>ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]</b> .	<b>ES Volume 1, Chapter 5 The Proposed Development [EN0110020/APP/6.5]</b> .  Embedded Mitigation of paragraphs 16.4.19 to 16.4.28 of this Chapter.

### Issues Scoped out of Assessment

16.4.10 Following the scoping exercise, some elements were scoped out of assessment in ES. **Table 16.20** presents the topics scoped out of assessment.

**Table 16.20: Topics Scoped Out of Assessment.**

Potential Effect / Topic	Development Phase	Rationale
Telecommunications and Utilities	All Phases	As requested in the Scoping Opinion, the ES demonstrates the design and embedded mitigation measures to appropriately safeguard telecommunications and utilities infrastructure including details of consultation undertaken.

### Statutory Consultation

16.4.11 A Statutory Consultation period was held between 16 September and 28 October 2025 in line with Section 47 of the Planning Act 2008. Feedback was sought from the local community and a range of consultee bodies based on the preliminary

information and assessments presented in the Draft Environmental Statement (Draft ES).

16.4.12 **Table 16.21** presents feedback from statutory consultees given at Statutory Consultation, and how this is addressed in this ES.

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Table 16.21: Statutory Consultation Feedback from the Statutory Consultation Period

Consultee	Consultee Feedback	How This is Addressed	Where This is Addressed in the ES
Cadent Gas	<i>“In respect of existing Cadent infrastructure, Cadent will require appropriate protection for retained apparatus including compliance with relevant standards for works proposed within close proximity of its apparatus.”</i>	Construction works within close proximity of Cadent apparatus will be undertaken in compliance with relevant standards. Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b> . Furthermore, protection for statutory undertakers’ assets is included within the protective provisions in the <b>Draft DCO [EN0110020/APP/3.1]</b> .	<b>oCEMP [EN0110020/APP/5.9]</b> .
Cadent Gas	<i>“Where diversions of apparatus are required to facilitate the scheme, Cadent will require adequate notice and discussions should be started at the earliest opportunity.”</i>	Adequate notice will be given if diversions of apparatus to facilitate the Proposed Development are required.	<b>oCEMP [EN0110020/APP/5.9]</b> .
National Grid Electricity Transmission	<i>“Where the Promoter intends to acquire land, extinguish rights, or interfere with or work within close proximity to any of National Grid Electricity Transmission PLC’s (NGET) apparatus and land, this will require appropriate protection and</i>	Construction works within close proximity of any NGET apparatus and land will be undertaken in compliance with relevant standards. Mitigation measures relating to	<b>oCEMP [EN0110020/APP/5.9]</b> .

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	<i>further discussion on the impact to its apparatus and rights...NGET will require an adequate from of Protective Provisions included within the Order.”</i>	undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b> . Furthermore, protection for statutory undertakers’ assets is included within the protective provisions in the <b>Draft DCO [EN0110020/APP/3.1]</b> .	
National Grid Electricity Transmission	<i>“The National Energy System Operator (NESO) took over the electricity network planning responsibility from National Grid Electricity System Operator Limited (NGESO) on the 1<sup>st</sup> October 2024. Please consult with NESO separately from NGET where further information on the strategic need or capacity is sought.”</i>	Noted.	N/A
National Grid Electricity Transmission	<i>“It should be noted that there may be further interactions with additional new strategic infrastructure where the projects are in their early development. NGET requests that all existing and future assets are given due consideration given their criticality to distribution of energy across the UK.”</i>	Construction works within close proximity of any NGET apparatus and land will be undertaken in compliance with relevant standards. Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b> .	<b>oCEMP [EN0110020/APP/5.9]</b> .

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National Grid Electricity Transmission	<i>“We would request that the potential impact of the proposed scheme on NGET’s existing and future assets...and including any proposed diversions is considered in any subsequent reports, including in the Environmental Statement, and as part of any subsequent application.”</i>	Construction works within close proximity of any NGET apparatus and land will be undertaken in compliance with relevant standards. Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b> .	<b>oCEMP [EN0110020/APP/5.9]</b> .
Northern Powergrid	<i>“We note Northern Powergrid have a number of cables and assets in the proposed DCO area and there are a number of Primary and Distribution substations near or within the red line area. We would be grateful if you could provide details of your interaction points with our assets so that we can review this more closely and our engineer can provide the appropriate comments and information.”</i>	Construction works within close proximity of any Northern Powergrid cables and assets will be undertaken in compliance with relevant standards. Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b> . Furthermore, protection for statutory undertakers’ assets are included within the protective provisions in the <b>Draft DCO [EN0110020/APP/3.1]</b> .	<b>oCEMP [EN0110020/APP/5.9]</b> .
Severn Trent	<i>“Please be advised there are Severn Trent Water assets within the Proposed</i>	Construction works within close proximity of any Severn	<b>oCEMP [EN0110020/APP/5.9]</b>

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	<p><i>Development site...Please keep any proposed building 5m clear of pressurised sewers, and 15m from any pumping station. We do not allow building over of public sewers or water mains. Please note the following protective strips where no building will be allowed</i></p> <p><b>Sewers</b></p> <p><i>Our records are a guide only, therefore you should carry out site investigation to confirm position, depth and size of sewers.</i></p> <ul style="list-style-type: none"> <li>● <i>For sewers up to and including 225mm diameter Severn Trent requires a protective strip of 6m placed centrally over the pipe.</i></li> <li>● <i>For sewers over 225mm diameter but less than 100mm Severn Trent requires a protective strip of 10m placed centrally over the pipe.</i></li> <li>● <i>For sewers greater than 100mm Severn Trent requires a protective strip of 15m placed centrally over the pipe.</i></li> <li>● <i>For Pumping Stations Severn Trent requires 15m protective strip from the edge of the compound.</i></li> </ul> <p><b>Water</b></p> <p><i>Our records are a guide only, therefore you should carry out site investigation to confirm position, depth and size of water mains (we require RAMS for this)</i></p>	<p>Trent assets will be undertaken in compliance with relevant standards. Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b>. Furthermore, protection for statutory undertakers' assets are included within the protective provisions in the <b>Draft DCO [EN0110020/APP/3.1]</b>.</p>	
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	<ul style="list-style-type: none"> <li>• For water mains less than 300mm diameter Severn Trent requires a protective strip of 6m placed centrally over the pipe.</li> <li>• For water mains 300mm diameter and above Severn Trent requires a protective strip of 12m placed centrally over the pipe.”</li> </ul>		
<p>Yorkshire Water Services (YWS)</p>	<p>“YWS water and wastewater infrastructure is present within the development boundary of Whitestone Solar 1-3. Notably, parcel W1 S3 contains several clean water assets, including:</p> <ul style="list-style-type: none"> <li>• A 24” cast iron live water main</li> <li>• An 18” cast iron water main</li> </ul> <p>It is essential that the Whitestone project team identifies appropriate stand-off distances and implements safeguarding or protective measures for all YWS assets within the red line boundary.</p> <p>We recommend that the project team undertake a desktop study using YWS statutory mapping records. This will support the development of a crossing schedule identifying any groundworks likely to require asset diversion or protection...YWS would welcome any engagement and asks that adequate assessment of our assets is given to minimise the need to disrupt or divert utility assets.</p>	<p>Construction works within close proximity of YWS water and wastewater infrastructure will be undertaken in compliance with relevant standards.</p> <p>Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b>.</p> <p>Furthermore, protection for statutory undertakers’ assets is included within the protective provisions in the <b>Draft DCO [EN0110020/APP/3.1]</b>.</p>	<p><b>oCEMP [EN0110020/APP/5.9]</b>.</p>

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	<p><i>Under no circumstances should construction activity near YWS assets commence until the actual position of the company's assets within the draft order limits have been confirmed by trial holes."</i></p>		
<p>Yorkshire Water Services</p>	<p><i>"There remain some unknown elements of this development and from the information provided it is likely there will be interaction with YWS assets. It is therefore essential that there is ongoing engagement. We would recommend further discussion on the following items:</i></p> <ul style="list-style-type: none"> <li><i>• Design of the scheme to minimise interaction with YWS assets and sensitive receptors.</i></li> <li><i>• Where interaction is identified details of required mitigation and / or diversion to be agreed with YWS in advance of development."</i></li> </ul>	<p>The Proposed Development has been designed to minimise interaction with YWS assets and sensitive receptors.</p> <p>Construction works within close proximity of YWS water and wastewater infrastructure will be undertaken in compliance with relevant standards.</p> <p>Mitigation measures relating to undertaking construction works within close proximity of existing telecommunications and utilities infrastructure are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b>.</p>	<p><b>ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]; and</b></p> <p><b>oCEMP [EN0110020/APP/5.9].</b></p>

### Other Consultation

- 16.4.13 The Applicant is in ongoing consultation with the following telecommunications and utilities providers as they were identified to be present within the Order Limits:
- Cadent (Gas)
  - CityFibre (Fibre)
  - Energy Assets (Electric)
  - ESP (Gas and Electric)
  - EU Networks (Fibre)
  - GATC (Electric, Gas, Water (Clean) and Fibre)
  - Lumen Technologies (Fibre)
  - MASTS (Fibre)
  - Mobile Broadband Network Limited (MBNL) (Fibre)
  - MUA Electricity (Electric)
  - National Grid Electricity Transmission (Electric and Fibre)
  - National Grid Electricity Distribution (Electric)
  - Northern PowerGrid (Electric)
  - National Roads Telecommunications Services (NRTS) Highways
  - OpenReach (Fibre)
  - Severn Trent (Water and Sewerage)
  - Virgin Media (CATV)
  - Yorkshire Water (Water and Sewerage); and
  - Zayo (Fibre).

### Assessment Methodology and Significance Criteria

#### Study Areas

- 16.4.14 The potential effects relating to the interaction between the Proposed Development and Telecommunications and Utilities are limited to within the Order Limits. As a result, the Study Area for Telecommunications and Utilities is the Order Limits of the Proposed Development.

#### Methodology for the Assessment of Effects

- 16.4.15 A desk-based study and consultation determined the telecommunications and utilities infrastructure within the Study Area.

#### Basis of the Assessment

- 16.4.16 **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** presents a summary of the design information for the Proposed Development

which has been used to inform this assessment including the construction methodology for the Site and Cable Corridors.

### Baseline

#### Baseline Data Sources

- 16.4.17 Existing Telecommunications and Utilities conditions within the Study Area have been defined and identified via a number of sources, including:
- PAS D Survey
  - National Grid Network Route Maps; and
  - Feedback from Statutory Consultees.

#### Baseline Conditions

- 16.4.18 Types, and owners of, existing Telecommunications and Utilities identified within the Order Limits are listed above in Section 16.4.13. Full details of all utilities in the Order Limits has been submitted with this Application.

### Embedded Mitigation

- 16.4.19 Consultation with relevant utilities and telecommunication providers will continue post consent as detailed design is undertaken and prior to construction. The design of the Proposed Development will continue to incorporate necessary protective measures to safeguard any existing infrastructure which may be impacted by the Proposed Development.
- 16.4.20 Avoiding Danger from Overhead Power Lines Guidance Note GS6<sup>38</sup> will be followed to maintain safe distances and heights from OHLs during construction. In addition, the goalpost-controlled crossing points will be implemented for plant movements under OHLs.
- 16.4.21 The maximum height of infrastructure associated with the Proposed Development is 13.5m (for the Substations). The maximum depth of construction works is 15m below ground level (BGL), which could be required to install pile foundations.
- 16.4.22 As stated in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** and in accordance with National Grid guidance<sup>39</sup>, a 5.3m minimum clearance would be maintained between the highest point of the PV modules to National Grid 400kV and 275kV overhead lines, accounting for both still and conductor swing.
- 16.4.23 Cable Corridor installation will be undertaken in accordance with HSG47 Guidance: Avoiding Danger from Underground Services<sup>40</sup> where relevant to do so. Installation will begin with the excavator removing the topsoil / vegetation and then layers of no more than 75mm will be removed at a time. Excavation will be supervised by a banksman and continual cable avoidance tool (CAT) and Genny (signal generator) scanning will be implemented.
- 16.4.24 Where cables would cross existing utilities, they would be laid at approximately 90 degrees (perpendicular) to the existing utilities, where possible. Doing so will minimise the effects from the construction of the Proposed Development. The installation of cables at least 0.6m above or below existing utilities infrastructure is a second example of a protective measure that has been implemented into the

design process to safeguard any existing infrastructure. This is also in line with National Grid Guidance<sup>41</sup>.

- 16.4.25 If an unknown service is encountered, construction works will immediately stop, and the engineer or utility owner will be contacted.
- 16.4.26 Further information regarding the protective measures incorporated into the design of the Proposed Development have been detailed in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** and the **outline Cable Construction Method Statement [EN0110020/APP/5.19]**.
- 16.4.27 The **oCEMP [EN0110020/APP/5.9]** sets out measures compliant with environmental regulations to minimise environmental impacts relating to utilities diversion. In addition, protective provisions for the benefit of statutory undertakers and electronic communications network code operators are included in the **Draft DCO [EN0110020/APP/3.1]**.
- 16.4.28 Embedded mitigation measures are anticipated to be similar to that of construction during the decommissioning phase of the Proposed Development. An updated telecommunications and utilities search will be undertaken prior to any decommissioning works to appropriately identify and protect any infrastructure installed during the operation and maintenance phase of the Proposed Development. An **oDEMP [EN0110020/APP/5.11]** has been submitted as part of this Application.
- 16.4.29 Following the implementation of the mitigation measures outlined above, the Proposed Development is not expected to have any adverse impacts on telecommunications or utilities. In agreement with the Planning Inspectorate, Telecommunications and Utilities is, therefore, scoped out of further assessment.
- 16.4.30 Overall, with the embedded mitigation implemented, the effect of the Proposed Development on Telecommunications and Utilities is anticipated to be **Negligible** and is therefore considered to be **Not Significant** in the context of EIA Regulations.

## 16.5 Major Accidents and Disasters

16.5.1 The ISEP (formerly IEMA) guidance document on Major Accidents and Disasters (MADs)<sup>42</sup> defines the following terms:

- Major Accidents: “Events that threaten immediate or delayed serious environmental effects to human health, welfare and/or the environment and require the use of resources beyond those of the client or its appointed representatives to manage. Whilst malicious intent is not accidental, the outcome (e.g. train derailment) may be the same and therefore many mitigation measures will apply to both deliberate and accidental events.”; and
- Disaster: “May be a natural hazard (e.g. earthquake) or a man-made/external hazard (e.g. act of terrorism) with the potential to cause an event or situation that meets the definition of a major accident.”

16.5.2 This section should be read in conjunction with:

- **ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]**
- **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**
- **ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]; and**
- **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13].**

### Legislation, Policy, and Guidance

16.5.3 The legislation, policy and guidance related to MADs, as detailed in **ES Volume 3, Appendix 16.1: Legislation, Policy and Guidance [EN0110020/APP/6.20]**, and relevant to the Proposed Development, are outlined below:

#### Legislation

16.5.4 Legislation that has been considered includes:

- Schedule 4 of the EIA Regulations 2017<sup>43</sup>
- The Construction (Design and Management) Regulations 2015<sup>44</sup>
- Electrical Safety, Quality and Continuity Regulations 2002<sup>45</sup>; and
- Health and Safety at Work Act 1974<sup>46</sup>.

#### National Policy

16.5.5 National policy that has been considered includes:

- UK Government, National Planning Policy Framework (NPPF) (2024)<sup>47</sup>; and
- Overarching National Policy Statement (NPS) for Energy EN-1 (2025)<sup>48</sup>.

#### Local Policy

16.5.6 There are no relevant local policy provisions in relation to major accidents and/or disasters.

### Guidance

- 16.5.7 Guidance that has been considered includes:
- Major Accidents and Disasters in EIA: An IEMA Primer<sup>42</sup>; and
  - House of Commons Research Briefing on Battery Energy Storage Systems (2025)<sup>49</sup>.

### Consultation

- 16.5.8 This section provides a summary of the consultation undertaken to date regarding the Proposed Development. Further detail on the consultation can also be found in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.2]**.

### EIA Scoping

- 16.5.9 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025. The Scoping Report captures the findings of the scoping exercise and outlines the technical guidance, standards, best practices, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Proposed Development on MADs.
- 16.5.10 A Scoping Opinion was received from the Planning Inspectorate on 03 June 2025 (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).
- 16.5.11 **Table.16.22** summarises how this Chapter of the ES addresses key points from the EIA Scoping Opinion comments related to MADs.

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**Table.16.22: Scoping Opinion Comments and How They Are Addressed in This ES**

Consultee	Issue Raised	How This is Addressed	Where This is Addressed in the ES
<i>The Planning Inspectorate</i>	<p><b>ID 3.11.5 Major Accidents and Disasters</b> <i>“The Inspectorate notes the consultation response from the Health and Safety Executive identifies that the Proposed Development crosses the consultation zones of several major accident hazard sites and pipelines. The Inspectorate agrees with the approach on the basis that is appropriately cross references between relevant aspect chapters on the ‘Other Environmental Topics’ chapter to clarify where LSE are assessed for specific major accidents and disasters. The ES should also include an assessment of any identified potential impacts to/from crossing major accident hazard sites and pipelines.”</i></p>	<p>Vulnerability of the Proposed Development to Major Accidents and Disasters and the risk of the Proposed Development contributing to these issues are assessed within the relevant technical chapters and referenced in <b>Table 16.24</b>. The MADs scoped into the assessment have been presented in <b>Table 16.24</b>.</p>	<p>This Section should be read in conjunction with the following chapters <b>ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]</b>, <b>ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]</b>, <b>ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]</b>, <b>ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]</b></p>
<i>Health and Safety Executive</i>	<p><i>Consideration of risk assessments 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>Vulnerability of the Proposed Development to Major Accidents and Disasters are assessed within the relevant technical chapters and MADs scoped into the assessment have been presented in <b>Table 16.24</b>.</p>	<p>This Section should be read in conjunction with the following chapters <b>ES Volume 2, Chapter 9: Ground Conditions and Land Quality [EN0110020/APP/6.9]</b>, <b>ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]</b>, <b>ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas</b></p>

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Consultee	Issue Raised	How This is Addressed	Where This is Addressed in the ES
			<b>Assessment [EN0110020/APP/6.11]; and ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]</b>
<i>Thrybergh Parish Council</i>	<i>Major accidents and disaster should not be scoped out due to the proximity of the development to housing</i>	Assessment of the impacts of the Proposed Development on Major Accidents and Disasters from the construction, operation and decommissioning phases has been included in the scope.	Section 16.5 of this Chapter

### Issues Scoped Out of Assessment

16.5.12 Following the ISEP guidance, potential hazards that meet the following criteria have been scoped out of the EIA:

- The Proposed Development is not vulnerable to the hazard or does not have the potential to cause the hazard;
- The hazard is not likely to result in effects that lead to fatality, multiple fatalities, permanent injury, widespread / irreversible harm or damage i.e., the hazard will not result in a major accident and / or disaster;
- There is no potential pathway or receptor in terms of EIA regulations; and
- It is a workplace hazard that will only impact the workers directly involved for example, fall from height or misuse of tools. These are an occupational health and safety incident that is not included within an EIA and instead managed through compliance of the Management of Health and Safety at Work Regulations and non-safety related legislation.

### Statutory Consultation

16.5.13 A Statutory Consultation period was held between 16 September and 28 October 2025 in line with Section 47 of the Planning Act 2008. Feedback was sought from the local community and a range of consultee bodies based on the preliminary information and assessments presented in the Draft Environmental Statement (Draft ES).

16.5.14 **Table 16.23** presents feedback from statutory consultees given at Statutory Consultation, and how this is addressed in this ES.

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**Table 16.23: Statutory Consultation Feedback from the Statutory Consultation Period**

Consultee	Consultee Feedback	How This is Addressed	Where This is Addressed in the ES
Sheffield Wildlife Trust	<p>Safety and Fire Risk</p> <p><i>“Given that large BESS installations have known risks of thermal runaway fires and toxic plume emissions and that the location near Brampton Common is adjacent to a priority habitat (Brampton Common Local Wildlife Site), we would expect significant buffers...and clear strategies in place to minimise risks to priority habitats and wildlife.”</i></p>	<p>The Proposed Development, including the location of permanent infrastructure (e.g., BESS), has been designed in consideration of safety and fire risk. BESS equipment has been located more than 2km from Brampton Common Local Wildlife Site.</p> <p>Mitigation measures relating to the safety and fire risk of the BESS are outlined in the <b>outline Battery Safety Management Plan (oBSMP) [EN0110020/APP/5.15]</b>.</p>	<p><b>ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5];</b></p> <p><b>oBSMP [EN0110020/APP/5.15].</b></p>
Sheffield Wildlife Trust	<p>Electrocution and Arching</p> <p><i>“Protected species of birds and bats flying overhead and small ground mammals such as badgers, foxes, and deer could be killed or burned if fencing is not maintained correctly. Arching can cause localised fires which threaten priority habitats...and ground nesting species and invertebrates.”</i></p>	<p>Details of the maintenance of all fencing within the Order Limits of the Proposed Development will be included in the OEMP. An <b>oOEMP [EN0110020/APP/5.10]</b> has been submitted alongside this Application. All electrical infrastructure, including cables, will be sourced, installed and maintained in accordance with relevant health and safety</p>	<p><b>oOEMP [EN0110020/APP/5.10].</b></p>

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		legislation making the likelihood of arcing very low.	
Health and Safety Executive (HSE)	<p><i>“According to HSE’s records, the proposed Whitestone Solar Farm project components as specified in the Whitestone Solar Farm, Draft Environmental Statement, Non-Technical Summary – Appendix 1: Figures, document number EN0110020, September 2025, drawing title ‘Indicative Mitigation Masterplan’ Sheets 1 to 8, dated 11/09/2025 version A01, do appear to cross the Consultation Zones of several Major Accident Hazard (MAH) sites and MAH pipelines.</i></p> <p><i>The Applicant should make contact with the operators of MAH sites, to inform an assessment of whether or not the Proposed Development is vulnerable to a possible major accident.</i></p> <p><i>Since the works will entail underground cabling and access routes, HSE strongly recommends that at the earliest opportunity, the Applicant liaises with the pipeline operators.”</i></p>	<p>As detailed in Section 16.4, the Applicant is in consultation with telecommunications and utilities providers, including the operators of MAH pipelines and sites.</p> <p>An assessment of the vulnerability of the Proposed Development to major accidents and disasters has been undertaken and is presented in <b>Table 16.24</b>.</p>	Section 16.4; <b>Table 16.23</b>
South Yorkshire Fire Rescue (SYFR)	<p><i>“SYFR would request due consideration be given by the Applicant and the planning authority to ensure a fire involving BESS can be safely contained.”</i></p>	<p>Due consideration has been given by the Applicant to ensure a fire involving BESS can be safely contained. In line with Fire and Rescue Service advice, relevant guidance, such as the guidance from the</p>	<b>ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]; and</b> <b>oBSMP [EN0110020/5.15]</b>

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		<p>National Fire Chiefs Council<sup>50</sup>, has been considered, as part of the design process and SYFR recommendations will be followed. An <b>oBSMP [EN0110020/APP/5.15]</b> has been produced and submitted as part of this Application.</p>	
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### Targeted Consultation

- 16.5.15 A Targeted Consultation period was held between 4 March and 3 April 2026 on proposed changes to the Order Limits. This included notifying relevant prescribed consultees. Feedback from this Targeted Consultation and the Applicant's response is included in the **Consultation Report [EN0110020/APP/5.1]**.
- 16.5.16 A second Targeted Consultation was held for any individuals that had been identified as land interests after the Statutory Consultation.
- 16.5.17 No comments were provided by statutory consultees through the Targeted Consultation period in relation to Major Accidents and Disasters.

### Assessment Methodology and Significance Criteria

- 16.5.18 This section sets out the scope and methodology for the assessment of the impacts of the Proposed Development on Major Accidents and Disasters from the construction, operation and maintenance, and decommissioning phases.

### Study Areas

- 16.5.19 Given the nature of MADs, the Study Area for the assessment will vary depending on the accident and / or disaster. For example, the Study Area relating to hydrological risks is considered to be within 1km of the Site.
- 16.5.20 The furthest extent of the Study Area beyond the Order Limits for MADs is 30km. Each Study Area has been considered in line with topic-specific legislation and professional judgement, policy and guidance and are detailed in **Table 16.24**.

### Methodology for the Assessment of Effects

- 16.5.21 Following ISEP (formerly IEMA) guidance, identified hazards (including their sources and pathways) were grouped into high-level 'Risk Event's based on their potential consequences. A relevant receptor was then assigned to each grouped Risk Event.
- 16.5.22 To determine the significance of effects, the following factors were considered:
- If the MAD has a direct or indirect effect on the Proposed Development;
  - The duration of the effect: long-term (more than a year) effects are more likely to be 'Significant' than medium- (between six months and a year) and short-term (less than six months) effects;
  - The geographical scale of the effect: global and regional effects are more likely to be 'Significant' than local effects; and
  - The sensitivity of the identified receptors: receptors considered to have a 'High' sensitivity are more likely to experience 'Significant' effects compared to those with a 'Low' sensitivity.
- 16.5.23 A realistic worst-case scenario was assumed when assessing the likely significant effects.
- 16.5.24 Risks categorised as 'Broadly Acceptable' and 'Tolerable if As Low As Reasonably Practicable (ALARP)' with embedded mitigation are considered to be 'Not Significant' in the context of EIA. In contrast, a risk categorised as 'Extreme' would be considered 'Significant' in the context of EIA.

### **Basis of the Assessment**

- 16.5.25 **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** presents a description of the Proposed Development which has been used to inform this assessment.

### **Assumptions, Exclusions and Limitations**

- 16.5.26 A realistic-worst case scenario was assumed when assessing the likely significant effects.
- 16.5.27 No exclusions and limitations have been identified for this assessment.

### **Baseline**

#### **Baseline Data Sources**

- 16.5.28 Existing and future baseline conditions for the MADs assessment have been identified and defined via desk-based assessments, and a number of cross topic approaches and sources. Further information on the process of identifying and defining existing and future baseline conditions is detailed in each technical chapter (**ES Volume 2, Chapters 6 – 15 [EN0110020/APP/6.6-6.15]**). The future baseline conditions are based on the expected 60 year lifecycle of the Proposed Development.
- 16.5.29 The baseline information is in line with information / survey results collected at the time of the writing the ES.

#### **Baseline Conditions**

- 16.5.30 The Proposed Development is located in an area with a low unexploded bomb risk<sup>51</sup>. In addition, the Proposed Development is not located within a safeguarding zone of an explosives site licensed under the Explosives Regulations 2014<sup>52</sup> or the Dangerous Goods in Harbour Areas Regulations 2016<sup>53</sup>.
- 16.5.31 The baseline conditions of the Proposed Development in relation to MADs has been informed by **ES Volume 2, Chapters 6-15 [EN0110020/APP/6.6-6.15]**. There are many sensitive receptors that could potentially be significantly affected as a result of the Proposed Development's vulnerability to external accidents or disasters. Consequently, the baseline environment for major accidents and disasters will include:
- Habitats and species
  - Local residents
  - Roads and railways; and
  - Utilities infrastructure.

#### **Embedded Mitigation**

- 16.5.32 The following specific mitigation measures relevant to MADs have been identified and have been considered as part of the assessment. A Commitments Register has been included alongside this ES (see **ES Volume 3, Appendix 2.4: Commitments Register [EN0110020/APP/6.20]**)

### Construction

- 16.5.33 The Applicant has committed to implementing a CEMP, which will include a Construction Health and Safety Plan and other relevant fieldwork specific Job Hazard Analysis (JHAs). This will ensure that employees and visitors are taking necessary safety measures to lower the likelihood of the occurrence of MADs and the associated risks. An **oCEMP [EN0110020/APP/5.9]** has been submitted alongside this Application and is secured via Requirement 4 of the **Draft DCO [EN0110020/APP/3.1]**.
- 16.5.34 Non-native invasive species are present within the Order Limits. It is an offence under section 14 of the Wildlife and Countryside Act 1981 for persons to release or allows to escape any animal which is either not ordinarily a resident and is not a regular visitor to Great Britain, or is listed in Parts 1, 1A or 1B of Schedule 9 to the Wildlife and Countryside Act 1981. The Applicant will implement mitigation measures designed to ensure that reasonable steps are taken to restrict the spread of non-native invasive species, these include but are not limited to, briefing construction staff, cordoning off areas with non-native invasive species present, and wheel washing. See the **oCEMP [EN0110020/APP/5.9]** for more information. In addition, to manage biosecurity risk, the oCEMP will include measures such as appropriate cleaning and / or disinfection of machinery and equipment in areas considered to be at high risk.
- 16.5.35 In accordance with the NPPF, the Proposed Development has been subject to a sequential design approach, and where possible, all infrastructure will be located within Flood Zone 1. Where PV arrays cannot be located within Flood Zone 1, this is detailed in **ES Volume 3, Appendix 10.2 Flood Risk Assessment (FRA) [EN0110020/APP/6.20]**, and the required base height of panels will be set out to be above the modelled flood levels for a 1 in 100-year event with an appropriate freeboard allowance. Details of the FRA are described in **ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]**.
- 16.5.36 The Proposed Development will also implement a Surface Water Drainage Strategy (SWDS) which has been designed to attenuate surface water runoff from hardstanding surfaces and control runoff from the Site, so that there is not an increase in runoff rates compared to the existing greenfield runoff. An **outline Surface Water Drainage Strategy (oSWDS) [EN0110020/APP/5.17]** has been submitted alongside this ES.

### Operation

- 16.5.37 Although safety incidents for BESS are rare, there is a potential fire risk associated with them. This will be managed by monitoring and control systems, cooling systems, and fire suppression systems, which will form part of the BESS, and which is designed to regulate temperatures to safe conditions to minimise the risk of fire. An **oBSMP [EN0110020/APP/5.15]** has been developed and submitted with the Application. The oBSMP outlines the potential safety risks associated with BESS and the relevant mitigation and management procedures to be implemented.
- 16.5.38 The oSWDS will also consider the potential fire risk associated with the BESS and will identify the proposed approach for fire suppression containment. The proposed approach for fire suppression containment will be in accordance with best practice and in consultation with SYFR.

- 16.5.39 New planting may be susceptible to biosecurity issues, such as the increase prevalence of pests and diseases, due to climate change. Monitoring will be proposed of newly created habitats within the first 5 years of planting to ensure that individual plants within habitats are thriving, with corrective actions and replacement as needed. Details on the condition assessment monitoring of habitats are included in **ES Volume 3, Appendix 6.4: Biodiversity Net Gain Report [EN0110020/APP/6.20]** and the **outline Landscape and Ecology Management Plan (oLEMP) [EN0110020/APP/5.13]**.
- 16.5.40 Details of the maintenance of all fencing within the Order Limits of the Proposed Development will be included in the OEMP. An **oOEMP [EN0110020/APP/5.10]** has been submitted alongside this Application.
- 16.5.41 In addition, as detailed in the **oOEMP [EN0110020/APP/5.10]** which is secured via Requirement 14 of the **Draft DCO [EN0110020/APP/3.1]** and following standard industry practice, a Hazard and Risk Analysis (HRA) will be undertaken throughout the lifecycle of the Proposed Development.

### Decommissioning

- 16.5.42 The implementation of measures to mitigate impacts that could lead to Significant effects in relation to MADs is anticipated to be managed in the same manner as during the construction phase. An **oDEMP [EN0110020/APP/5.11]** has been developed and submitted alongside this ES.
- 16.5.43 The assessment of likely significant effects takes into account adoption of these embedded mitigation measures in full.

### Assessment of Effects

- 16.5.44 **Table 16.24** presents the likely significant effects of the Proposed Development on MADs.

Table 16.24: Major Accidents and Disasters Assessed Within the Scope of the ES

Major Accident and / or Disaster	Receptor	Study Area	Assessment of Likely Significant Effects
Flooding	Infrastructure, property and people in areas of increased flood risk	1km	<p>The majority of the Order Limits are located in Flood Zone 1, with less than 0.1% annual probability of flooding. As a result, the Proposed Development has a low vulnerability to flooding.</p> <p>The findings relating to the vulnerability of the Proposed Development to flooding, and its potential to exacerbate flooding, is covered in <b>ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]</b> and <b>ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]</b>. A Climate Change Resilience Review (CCRR) has been carried out in <b>ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]</b> to assess the climate related risks to the construction, operation and maintenance, and decommissioning phases of the Proposed Development. The CCRR found that the Significant effects of flooding to be <b>Not Significant</b> after implementing the embedded mitigation measures. This finding is consistent with that of <b>ES Volume 2, Chapter 10: Water Resources and Flood Risk [EN0110020/APP/6.10]</b> which states ‘with the embedded mitigation in place the potential Significant effects for all hydrological receptors and water resources is <b>Not Significant</b> for the construction, operation and maintenance and decommissioning of the Proposed Development on nearby receptors’.</p> <p>The risk of the Proposed Development to flooding is therefore assessed as Tolerable if ALARP (<b>Not Significant</b>).</p>

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Major Accident and / or Disaster	Receptor	Study Area	Assessment of Likely Significant Effects
Fire	Local residents, habitats and species	500m	<p>There is a potential fire risk associated with the BESS. The fire risk associated with the BESS will be mitigated by the measures outlined in the <b>oBSMP [EN0110020/APP/5.15]</b>. The BESS is designed to operate under ambient temperatures of up to 35 degrees Celsius (°C), and up to 50°C with a 10% reduction in energy generation. As detailed in the CCRA in <b>ES Volume 2, Chapter 11: Climate Change and Greenhouse Gas Assessment [EN0110020/APP/6.11]</b>, the number of days above 35°C is relatively low, with an incremental increase up to 2080. As a result, the exposure of the Proposed Development to both the direct and indirect risk of fire associated with the BESS is Tolerable if ALARP (<b>Not Significant</b>).</p>
Road Accidents	Road users	Local Road Network to be used for Site and Cable Corridors access	<p>The Study Area for traffic and transport has been defined based on those roads that are expected to experience increased traffic flows associated with the construction of the Proposed Development. To understand the risk of road collisions and accidents associated with the Proposed Development, a Road Traffic Collision (RTC) Assessment has been undertaken. The RTC Assessment is set out in <b>ES Volume 3, Appendix 13.2: Transport Statement [EN0110020/APP/6.20]</b>. In summary, the RTC Assessment found that the roads with higher numbers of recorded collisions tend to be busier, higher-speed routes. In contrast, the less trafficked roads, closer to the Proposed Development’s access points, show no clear pattern of incidents, with some recording no collisions over the five-year study period. Automatic Traffic Counts (ATCs) were undertaken in June 2025 for a duration of 7 days (24-hours per day). <b>ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]</b> concluded that the effect of the Proposed Development on road safety was <b>Negligible to Minor</b>, and is therefore, considered to be <b>Not Significant</b>. <b>ES Volume 3,</b></p>

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Major Accident and / or Disaster	Receptor	Study Area	Assessment of Likely Significant Effects
			<p><b>Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b> concluded that with the implementation of mitigation the effect of glint and glare from the Proposed Development on road receptors is <b>Not Significant</b>. The proposed screening is shown on <b>ES Volume 3, Figure 5.1: Illustrative Masterplan [EN0110020/APP/6.19]</b> and detailed in the <b>oLEMP [EN0110020/APP/5.13]</b>.</p>
Aircraft Disaster	Pilots and Aircraft	30km	<p>The closest aviation receptor to the Proposed Scheme is Netherthorpe Airfield, located approximately 4.6km from W3.</p> <p>The potential for Glint and Glare to affect aircraft has been assessed in <b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b>, and summarised in this Chapter. With the implementation of anti-reflective coating the effect of glint and glare from the Proposed Development on pilots Netherthorpe Airfield and Doncaster Airport is assessed as <b>Not Significant</b>.</p> <p>Following the implementation of mitigation measures, the risk of aircraft disaster as a result of glint and glare from the Proposed Development is assessed as Tolerable if ALARP (<b>Not Significant</b>).</p>
Rail Disaster	Train Drivers and Trains	1km	<p>The potential for Glint and Glare to affect trains has been considered in <b>ES Volume 3, Appendix 16.2: Glint and Glare Report [EN0110020/APP/6.20]</b>. The following railway lines were identified to be located within 1km of the Proposed Development:</p> <ul style="list-style-type: none"> <li>• Sheffield to Lincoln Railway Line;</li> <li>• Midland Main Line; and</li> <li>• South Yorkshire Joint Railway</li> </ul> <p>The Glint and Glare assessment concluded that the Magnitude of Impact for all road and rail receptors is <b>Low or None</b>. As a result, the effect of glint and glare from the Proposed Development is considered to be <b>Not Significant</b> in the context of EIA Regulations.</p>

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Major Accident and / or Disaster	Receptor	Study Area	Assessment of Likely Significant Effects
			<p>The <b>oLEMP [EN0110020/APP/5.13]</b> outlines the proposed embedded mitigation measures relating to Glint and Glare (e.g., visual screening between receptors and the Proposed Development).</p> <p>Following the implementation of the embedded mitigation measures the risk of rail disaster as a result of glint and glare from the Proposed Development is assessed as Tolerable if ALARP (<b>Not Significant</b>).</p>
<p>Utilities Failure or explosion (e.g., communications, gas, electricity, oil, sewage, and water)</p>	<p>Employees and local residents; Anthropogenic; Ecological; and Infrastructure</p>	<p>Order Limits</p>	<p>It is known that there are existing OHLs and buried pipelines present within the Order Limits. The Proposed Development therefore has the potential to affect or be affected by existing utility infrastructure above and below ground. Impacts to or failure of this infrastructure could potentially lead to a major accident and potential impacts to human health.</p> <p>With the implementation of the embedded mitigation detailed in Section 16.4 of this Chapter, the potential effects of the Proposed Development on telecommunications and utilities is Not Significant. In consideration of this, the risk of utilities failure or explosion(s) as a result of the Proposed Development is assessed as Tolerable if ALARP (<b>Not Significant</b>).</p> <p>Mitigation measures relating telecommunications and utilities are outlined in the <b>oCEMP [EN0110020/APP/5.9]</b>.</p> <p>Furthermore, protection for statutory undertakers' assets is included within the protective provisions in the <b>Draft DCO [EN0110020/APP/3.1]</b>.</p>

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Major Accident and / or Disaster	Receptor	Study Area	Assessment of Likely Significant Effects
Invasive Species and Plant Disease	Habitats and species	1km	<p>Non-native invasive species are present within the Order Limits. As a result, the Applicant is required to restrict the spread of these species. New planting may also be susceptible to biosecurity issues, such as the increase prevalence of pests and diseases, due to climate change. This will occur regardless of the Proposed Development. As a result, the Proposed Development is not anticipated to exacerbate any negative impacts of climate change to biodiversity-related sensitive receptors. However, as set out in <b>ES Volume 2, Chapter 6: Biodiversity and Nature Conservation [EN0110020/APP/6.6]</b> and the <b>oLEMP [EN0110020/APP/5.13]</b>, the planting design will take account of biosecurity risks through a wider mix of species and the omission of any species for which there is a known increased risk of disease or pathogen. There is the potential for disease and pathogen transfer (including undesirable weed species) between different areas of agricultural land.</p> <p>The loss of soil resource is considered as the main cause of disease and pathogen transfer, due to the transfer of soil (and incorporated seed / spore bank) from infected to uninfected areas. An Outline Soil Management Plan (oSMP) has been included within the <b>oCEMP [EN0110020/APP/5.9]</b> and sets out appropriate measures minimise soil loss and hence biosecurity risk.</p> <p>The <b>oCEMP [EN0110020/APP/5.9]</b> includes measures such as appropriate cleaning and / or disinfection of machinery and equipment in areas considered to be at high risk. The UK Government’s website advertising current occurrences and imposed restrictions with regards to animal and plant diseases would be checked both pre-construction and at regular intervals throughout construction.</p>

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Major Accident and / or Disaster	Receptor	Study Area	Assessment of Likely Significant Effects
			Following the implementation of the embedded mitigation, the risk of invasive species and plant disease is assessed as Tolerable if ALARP ( <b>Not Significant</b> ).

- 16.5.45 By their very nature, MADs have the potential to have Significant effects. Therefore, the focus is on prevention and response planning to reduce any additional risk or effect of this happening which may arise as a result of the Proposed Development. However, it is not expected that there is a Significant risk of major accidents and disasters occurring during construction, operation and maintenance, or decommissioning as a result of the Proposed Development.

### **Additional Mitigation and Residual Effects**

#### **Additional Mitigation**

- 16.5.46 Additional mitigation measures, beyond those embedded into the design of the Proposed Development, are not considered to be necessary for MADs impacts.

#### **Residual Effects**

- 16.5.47 The residual effects from MADs are as presented in **Table 16.24**.

#### **Cumulative Effects**

- 16.5.48 This section assesses the potential cumulative MADs effects of the Proposed Development. The methodology of this assessment is presented in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.2]**.

#### **Intra-Cumulative Effects**

- 16.5.49 Intra-cumulative impacts can be defined as those that occur where a single receptor is affected by more than one source of effect arising from different aspects of the project. The assessment of MADs presented in **Table 16.24** considers the combined interaction of relevant hazards, receptors, and pathways associated with the Proposed Development. On that basis, the MADs assessment is inherently an intra-cumulative effects assessment, and as a result, no separate or further assessment of intra-cumulative effects is required.

#### **Inter-Cumulative Effects**

- 16.5.50 Inter-project effects refer to the impacts that arise from other existing and, or approved development within reasonable proximity of the Proposed Development, which individually might not be Significant, but when considered together could create a Significant cumulative effect on a shared receptor.
- 16.5.51 Due to their event-based and site-specific nature, MADs do not give rise to incremental or additive effects in the same manner as routine construction or operational activities. Accordingly, the potential for inter-cumulative effects is limited to scenarios where a credible pathway exists for an accidental event at one development to interact with, or be exacerbated by, another development and thereby affect a shared receptor.
- 16.5.52 The potential for cumulative effects arising from construction and decommissioning traffic, in relation to road accidents, including interactions with traffic generated by other developments, is assessed within **ES Volume 2, Chapter 13: Traffic and Transport [EN0110020/APP/6.13]**. That assessment concludes that Significant cumulative effects are unlikely, due to limited overlap of

the traffic Study Areas and the limited levels of traffic generated by cumulative developments that could interact with traffic associated with the Proposed Development, in relation to road accident risk. The assessment used the assumption that other existing and approved developments would be subject to appropriate traffic management measures and procedures, secured through their respective consents.

- 16.5.53 A further consideration in relation to MADs is the potential for fire events associated with the BESS. With the mitigation and management measures identified within the **oBSMP [EN0110020/APP/5.15]**, it is not expected that other developments would increase the risk or severity of the associated effects. This conclusion used the assumption that other developments are designed, constructed and operated in accordance with applicable fire safety legislation, standards and mitigation requirements, secured through their respective consents.
- 16.5.54 The assessment therefore concludes that Significant inter-cumulative effects in relation to MADs are not anticipated.

### **Summary**

- 16.5.55 The effect of the Proposed Development on all identified MADs is Tolerable if ALARP and is consequently, in the context of EIA Regulations, considered to be **Not Significant** in the context of EIA Regulations.

## 16.6 Electromagnetic Fields

- 16.6.1 This section of the ES considers the potential effects of the Proposed Development on Electric and Electromagnetic Fields (EMFs).
- 16.6.2 This assessment considers the Technical Advice for Scoping Solar Development<sup>54</sup> which states: “Where proposed cables are over 132 kV, an EMF Assessment should be provided in an appendix to the Environmental Statement. This should include the location, routing and voltages of any cables over 132 kV and a risk assessment to any human and ecological sensitive receptors within the Zone of Influence (Zoi).”
- 16.6.3 EMFs are produced by the flow of electricity, for example, along electrical cables. NPS EN-5<sup>55</sup> highlights that electrical fields are eliminated by placing cables underground, however, underground cables still produce magnetic fields. Electric fields are the result of voltages applied to electrical conductors and equipment. Fences, shrubs and buildings easily block electric fields. EMF are produced by the flow of electric current; however, unlike electric fields, most materials do not readily block EMF. The intensity of both electric fields and EMF diminishes with increasing distance from the source.
- 16.6.4 The Proposed Development will be interconnected and connected to the new 400kV National Grid substation proposed on land immediately east of Long Lane, Brinsworth, S60 4JJ (Long Lane 400kV Substation) by underground high voltage cables. At this stage of the design process, the exact route of these underground cables is unknown, and as a result, corridors have been identified within which the cables would run. The Cable Corridors detailed in this ES are therefore wider than would be required for the laying of the cables. For further details on the cables and Cable Corridors, see **ES Volume 1, Chapter 3: The Site and Surrounding Area [EN0110020/APP/6.3]** and **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**.
- 16.6.5 No overhead electricity cables will be used or constructed as part of the Proposed Development. All electrical cables for the Proposed Development will be buried, except for relatively short lengths of low voltage cabling connecting solar panels and PCS (which is typically above ground and fixed to mounting structure). Dimensions of trenches for cable burial will vary depending on the arrangement of cables/ducts and are further described in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**.
- 16.6.6 Low voltage cabling is required on the Site between the solar PV modules and transformers. These cables are typically less than 1.5kV. Medium to high voltage cables (33kV or higher) are required to transfer electricity from the PCS to the Primary Substation,
- 16.6.7 Electricity is then exported from the Primary Substation to the grid connection and Long Lane 400kV Substation via high voltage underground cables which are typically installed at maximum depth of 3m.

### Legislation, Policy, and Guidance

- 16.6.8 The following section has been prepared in line with the following relevant Policy, Legislation, and Guidance, details of which are presented in **ES Volume 3, Appendix 16.1: Legislation, Policy and Guidance [EN0110020/APP/6.20]**.

### Legislation

16.6.9 Legislation that has been considered includes:

- The Control of Electromagnetic Fields at Work Regulations 2016<sup>56</sup>.

### National Policy

16.6.10 National policy that has been considered includes:

- NPS for Electricity Networks Infrastructure (EN-5) (2025)<sup>57</sup>.

### Local Policy

16.6.11 There are no relevant local policy provisions in relation to EMFs.

### Guidance

16.6.12 Guidance that has been considered includes:

- National Grid Undergrounding High Voltage Electricity Transmission Lines (2015)<sup>58</sup>
- Department of Energy and Climate Change (DECC) Power Lines: Demonstrating Compliance with EMF Public Exposure Guidelines (2012)<sup>59</sup>
- Energy Networks Association, Electric and Magnetic Fields: The Facts (2012)<sup>60</sup>
- Energy Networks Association. Electric and Magnetic Fields (2017)<sup>61</sup>; and
- International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic, and Electromagnetic Fields<sup>62</sup>.

### Consultation

16.6.13 This section provides a summary of the consultation undertaken to date regarding the Proposed Development. Further detail on the consultation can also be found in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.20]**.

### EIA Scoping

16.6.14 A Scoping Opinion was sought from the Planning Inspectorate to determine the content of the assessment, as well as the approach and methods to be used. The outcomes of this exercise were documented in the Scoping Report (**ES Volume 3, Appendix 2.1: EIA Scoping Report [EN0110020/APP/6.20]**), which was submitted to the Planning Inspectorate on 23 April 2025. The Scoping Report captures the findings of the scoping exercise and outlines the technical guidance, standards, best practices, and criteria to be applied in the assessment to identify and evaluate the likely significant effects of the Proposed Development on EMFs.

16.6.15 A Scoping Opinion was received from the Planning Inspectorate on 3 June 2025 (**ES Volume 3, Appendix 2.2: EIA Scoping Opinion [EN0110020/APP/6.20]**).

16.6.16 **Table 16.25** summarises how this Chapter of the ES addresses key points from the EIA Scoping Opinion comments related to EMFs.

**Table 16.25: Scoping Opinion Comments and How They Are Addressed in This ES**

Consultee	Issue Raised	How This is Addressed	Where This is Addressed in the ES
<i>The Planning Inspectorate</i>	<p><b>ID 3.11.6 Electromagnetic Fields (EMFs)</b></p> <p><i>“The Inspectorate agrees that a separate chapter for EMFs can be scoped out of the ES on the basis that the EMF assessment will be provided as a technical appendix to support any relevant ES chapter assessments. As cables have potential to be above 132 kV, the technical appendix should inform the assessment of LSE and mitigation measures in any relevant aspect chapters to assess potential effects on both human and ecological receptors. The ES should clearly cross reference where significant effects from EMF are reported and assessed.”</i></p>	<p>The Proposed Development design will be compliant with the relevant policy, legislation and guidance detailed in <b>ES Volume 3, Appendix 16.1: Legislation, Policy and Guidance [EN0110020/APP/6.20]</b> including the Electricity Safety, Quality and Continuity Regulations (2002)<sup>63</sup>. Assessment of the potential EMF effects is provided in Section 16.6 of this Chapter (not in a separate appendix). Where appropriate, the potential effects of EMFs on ecological receptors have been assessed in <b>ES Volume 2, Chapter 6: Biodiversity and Nature Conservation [EN0110020/APP/6.6]</b>.</p>	<p>Section 16.6 of this Chapter.</p>

### Issues Scoped out of Assessment

16.6.17 Following the scoping exercise, some elements were scoped out of assessment in this ES. **Table 16.26** presents the topics scoped out of assessment.

**Table 16.26: Topics Scoped Out of Assessment.**

Potential Effect / Topic	Development Phase	Rationale

EMFs	Construction	No EMFs will occur during the construction phase of the Proposed Development as the infrastructure will yet to be energised.
EMFs	Decommissioning	No EMFs will occur during the decommissioning phase of the Proposed Development as the infrastructure will no longer be energised.

### Statutory Consultation

- 16.6.18 A Statutory Consultation period was held between 16 September and 28 October 2025 in line with Section 47 of the Planning Act 2008. Feedback was sought from the local community and a range of consultee bodies based on the preliminary information and assessments presented in the Draft Environmental Statement (Draft ES).
- 16.6.19 No feedback from statutory consultees relating to EMFs was received at Statutory Consultation.

### Targeted Consultation

- 16.6.20 A Targeted Consultation period was held between 4 March and 3 April 2026 on proposed changes to the Order Limits. This included notifying relevant prescribed consultees. Feedback from this Targeted Consultation and the Applicant’s response is included the **Consultation Report [EN0110020/APP/5.1]**.
- 16.6.21 A second Targeted Consultation was held for any individuals that had been identified as land interests after the Statutory Consultation.
- 16.6.22 No comments were provided by statutory consultees through the Targeted Consultation period in relation to EMFs.

## Assessment Methodology

### Study Area

- 16.6.23 The potential effects of EMFs associated with the Proposed Development are limited to the buried cables within the Order Limits. As a result, the Study Area for the EMF Assessment is the Order Limits of the Proposed Development, as shown in **ES Volume 3, Figure 3.1: Order Limits [EN0110020/APP/6.19]**.

### Methodology for the Assessment of Effects

- 16.6.24 Underground cables eliminate the electric field altogether as it is screened out by the sheath around the cable, but they still produce EMF. Therefore, effects of electric fields are not considered within the assessment, but effects of EMF have been considered further.
- 16.6.25 The Control of Electromagnetic Fields at Work Regulations 2016 sets out the duties of employers in relation to controlling the risks of EMF to employees. This includes a requirement to assess employees’ potential exposure to EMF with reference to action levels (ALs) and exposure limit values (ELVs). Therefore, as the effects of EMF on workers for the Proposed Development will be controlled

and mitigated to acceptable levels through the legislative framework, impacts on workers are not considered within the assessment. The assessment therefore focusses on the potential impacts on the public.

- 16.6.26 NPS EN-5<sup>57</sup>, electric and magnetic fields have the potential to have adverse impacts on aviation. Safeguarding zones are defined in Planning Circular 01/0318: Safeguarding Aerodromes, Technical Sites and Military Explosive Storage Areas. The Proposed Development is not within the safeguarding zone of any safeguarded civil aerodrome as listed on Annex 3 of the Planning Circular: Officially Safeguarded Civil Aerodromes<sup>64</sup>. It is noted that the closest airfield to the Site is Netherthorpe Airfield, approximately 4.6km away, but this is not included in Annex 3. Additionally, at the distances of separation between the underground cables, the on-site substations and potential aviation receptors, the levels of EMF experienced by potential aviation receptors are considered to be negligible and therefore aviation receptors are not included in the assessment.
- 16.6.27 NPS EN-5 (paragraph 2.9.59)<sup>57</sup> recognises that *“there is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMF has any agriculturally significant consequences.”* Therefore, impacts to agriculture and natural ecosystems has not been included within the assessment. However, specific EMF impacts on biodiversity are assessed within **ES Volume 2, Chapter 6: Biodiversity and Nature Conservation [EN0110020/APP/6.6]**.
- 16.6.28 The ICNIRP is an independent, non-profit organisation providing scientific information and science-based advice on protection from non-ionizing radiations (e.g., EMFs). Although the most recent ICNIRP Guidelines for Limiting Exposure to Electromagnetic Fields was published in 2020<sup>65</sup>, the guidelines adopted by the UK Government are that of the 1998 publication<sup>62</sup>.
- 16.6.29 The DECC guidance<sup>59</sup> document states that underground cables at voltages up to and including 132kV are considered not capable of exceeding the ICNIRP exposure guidelines for EMF and that compliance with exposure guidelines for such equipment can be assumed unless evidence is brought to the contrary in specific cases. Therefore, low voltage and medium voltage cabling for the Proposed Development (as discussed in section 16.6.6) are not considered further in the assessment.
- 16.6.30 The point of connection (POC) for the Proposed Development to the National Grid would be via the Long Lane 400kV Substation. Whitestone 1, 2, and 3 would be interconnected and connected to the grid by medium to high voltage underground cables. As some of these will be higher than 132kV, it is necessary to perform an evaluation as to whether the exposure limitations stated in ICNIRP 1998 are likely to be exceeded.
- 16.6.31 The ICNIRP ‘reference levels’ for the general public exposure are 100 microteslas ( $\mu\text{T}$ ) and 5000 Volt per metre ( $\text{Vm}^{-1}$ ) for EMF. The reference levels are not limits but provide guidance for assessing compliance and reducing the risk of effects. The reference level is the level above which more investigation is needed if this level of exposure is likely to occur. The permitted levels of exposure (basic restriction) are somewhat higher, 360 $\mu\text{T}$  and 9000 $\text{Vm}^{-1}$ . They apply where the time of exposure is Significant, for instance in a residence. As a worst-case the lower ‘reference level’ of 100 $\mu\text{T}$  is used in the assessment as the threshold at which further investigation would be required to confirm compliance with the permitted level.
- 16.6.32 The National Grid guidance document<sup>58</sup> states that for a 400kV cable buried at 0.9m depth, the typical magnetic field is 24 $\mu\text{T}$  when on the centre line of the

cable, 3µT at 5m from the cable centreline, and 0.9µT at 10m from the cable centreline. The maximum levels recorded by National Grid were 96µT directly on top of the cable, 13µT at 5m, and 3.6µT at 10m. The maximum recorded levels of EMF directly above an underground 400kV cable are therefore less than 30% of the permitted levels and 96% of the reference levels set by ICNIRP.

16.6.33 Taking into account this guidance and the UK limits set for safety of members of the public, the electromagnetic field for HV cables buried at a minimum depth of 1.4m would comply with the ICNIRP limits even if the cabling were directly under a human receptor. In reality, high voltage cables are very unlikely to be within 5 metres of the closest residential property. Therefore, no Significant impacts are expected to arise from electromagnetic fields as a result of the underground cables that form part of the Scheme.

### Basis of the Assessment

16.6.34 **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** presents a summary of the currently available design information for the Proposed Development which has been used to inform this assessment.

## Baseline

### Baseline Data Sources

16.6.35 Existing and future baseline conditions for the EMF Assessment have been identified and defined via a desk-based assessment. Data sources include:

- **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**; and
- National Grid Network Route Maps<sup>66</sup>.

### Existing Baseline Conditions

16.6.36 This section presents the receptors considered within the baseline of the EMF assessment.

### Aquatic Species

16.6.37 The watercourses included within the EMF Assessment are shown in **Table 16.27**.

**Table 16.27: Watercourses with Over 132 kV Cable Corridors Passing Directly Below**

Watercourse	Cable Corridor
Firsby Brook	CRB
Hellaby Brook	CRB
Pinch Mill Brook	CRC
Ulley Brook	CRF, CRH
Anston Brook	CRK-1
Chesterfield Canal	CRL
Unnamed watercourse	CRL

**PRoWs**

16.6.38 The PRoWs included within the EMF Assessment are shown in **Table 16.28**.

**Table 16.28: PRoWs Crossing Above Cable Corridors Over 132 kV**

PRoW	Cable Corridor
Park Lane Bridleway	CRB
Park Lane Footpath	CRB
Bramley Footpath no.7	CRB
Whiston Footpath no.23	CRC
Whiston Footpath no.24	CRC
Whiston Footpath no.16	CRD-1
Whiston Footpath no.6	CRD-1
Whiston Footpath no.15	CRD-1
Whiston Footpath no.12	CRD-1, CRD-2, CRE
Whiston Footpath no.10	CRE
Whiston Footpath no.13	CRD-2
Whiston Footpath no.14	CRD-2
Thurcroft Footpath no.8	CRI-1
Aston Bridleway no.18	CRI-2
Todwick Footpath no.6	CRJ
Anston Footpath no.6	CRL
Anston Bridleway no.7	CRL
Anston Bridleway no.8	CRL
Harthill Bridleway no.16	CRM
Harthill Footpath no.17	CRM
Harthill Bridleway no.4	CRN

**Residential Dwellings**

16.6.39 There are no residential dwellings within the Cable Corridors.

**Embedded Mitigation**

16.6.40 At this stage in the design process, the exact route of the underground cables is unknown, Cable Corridors have, therefore, been identified within which the cables would run. Consequently, the Cable Corridors detailed in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** are wider than would be required for the laying of cables.

16.6.41 All high voltage cabling would be laid below ground according to British Standards and regulations. Cables crossing watercourses would be installed at least 1.5m below the bed of the watercourse. Mitigation relating to EMFs will be secured through the OEMP. An **oOEMP [EN0110020/APP/5.10]** has been developed and submitted alongside this Application.

16.6.42 **Outline Design Parameters [EN0110020/APP/7.3]** are presented in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]** which include a number of standard buffers for location of underground cables where practicable.

## Assessment of Effects

### Operation and Maintenance

#### Aquatic Species

- 16.6.43 There is limited evidence regarding the effects of EMFs on fish, with the majority of research focussing on marine environments. Existing research primarily reports behavioural effects (e.g., attraction or avoidance, slowing migration, and disrupting natal homing), not biological. It is therefore considered that the Proposed Development has the potential to effect the following migratory fish identified in **ES Volume 2, Chapter 6: Biodiversity and Nature Conservation [EN0110020/APP/6.6]**:
- Brown trout (*Salmo trutta*)
  - Common barbel (*Barbus barbus*)
  - European bullhead (*Cottus gobio*); and
  - European Eel (*Anguilla anguilla*).
- 16.6.44 With the exception of brown trout, all migratory fish identified are benthic. Given their closer proximity to underground cables beneath watercourses, benthic fish are more likely to be effected by EMFs<sup>67</sup>. However, the existing research surrounding the effects of EMFs on fish can be contradictory. For example, one study showed that EMFs slowed the swimming speed of European eels<sup>68</sup>, whilst another reported no behavioural response in European eels following exposure to EMFs<sup>69</sup>. Although there is uncertainty surrounding how and if fish are effected by EMFs, effects reported are typically not considered to lead to destruction and / or damage at a population level<sup>70</sup>.
- 16.6.45 NPS EN-3 states *“Burial of the cable increases the physical distance between the maximum EMF intensity and sensitive species. However, what constitutes sufficient depth to reduce impact will depend on the geology of the seabed.”* A 400kV underground cable typically produces up to 31µT, however, the most they can produce is 96 µT. Under a worst-case scenario of 96µT, the EMFs produced by the underground cables will not exceed the maximum permitted exposure levels.
- 16.6.46 Cables crossing watercourses would be installed at least 1.5m below the bed of the watercourse as detailed in the **Outline Design Parameters [EN0110020/APP/7.3]** and presented in **ES Volume 1, Chapter 5: The Proposed Development [EN0110020/APP/6.5]**. Considering the limited research with inconsistent conclusions, and the maximum EMFs produced by a 400kV underground cable, the effects of EMFs on aquatic species are predicted to be **Not Significant**.

#### PRoWs

- 16.6.47 The presence of members of the public directly or adjacent to underground cables of the Proposed Development would be transient with users of PRoWs only exposed to EMFs for a short period of time it is considered that the level of exposure would be notably less than those associated with many household appliances (e.g., using a vacuum cleaner, at a distance of 3cm has a magnetic field of between 200 and 800µT<sup>71</sup>). Therefore, the effects of EMFs to users of PRoW are predicted to be **Not Significant**.

### Residential Dwellings

- 16.6.48 There are no residential dwellings within the Cable Corridors, however, there are residential dwellings within 5m of the edge of the Cable Corridors. Using the National Grid maximum known levels of electro-magnetic field generation for 400kV cables assumptions, at a burial depth of 0.9m, and a distance of 5m from the centreline of an underground cable, the maximum magnetic field is  $13\mu T^{72}$ . A magnetic field of  $13\mu T$  is significantly lower than both the UK Government maximum permitted exposure level and the ICNIRP reference level.
- 16.6.49 Although there are residential dwellings within 5m of the Cable Corridors, a typical working width of 30-40m is anticipated with construction vehicles needing to manoeuvre both sides of the trench within the working width. Therefore, it is highly unlikely that cables will be installed within 5m of a property.
- 16.6.50 Consequently, any exposure to EMFs will be significantly below both the UK Government maximum permitted exposure level and the much lower ICNIRP reference level, and the effects of EMFs on residential receptors are predicted to be **Not Significant**.

### Cumulative Effects

- 16.6.51 This Section assesses the potential cumulative EMF effects of the Proposed Development. The methodology of this assessment is presented in **ES Volume 1, Chapter 2: EIA Methodology [EN0110020/APP/6.2]**. Intra-cumulative effects, including those relating to Human Health impacts, are presented in **ES Volume 2, Chapter 17: Cumulative Effects Assessment [EN0110020/APP/6.17]**.
- 16.6.52 Potential locations where cumulative EMF could occur include:
- The Cable Corridors and infrastructure associated with Long Lane 400kV Substation; and
  - The electrical infrastructure associated with other projects that overlap the Order Limits.
- 16.6.53 However, it is expected that all electrical infrastructure for the Proposed Development and other cumulative projects will be located and installed in accordance with guidance listed in Section 16.6.12. This will result in magnetic field strengths well below the ICNIRP reference level of  $100\mu T$  and therefore **No Significant effects** are predicted from the Proposed Development cumulatively with other projects.

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