

The Great Grid Upgrade

Brinsworth to Chesterfield

Brinsworth to Chesterfield

Environmental Appraisal Report - Part 1 of 5

October 2026



nationalgrid

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1. Introduction

1.1 Purpose and Scope of the Environmental Appraisal Report (EAR)

- 1.1.1 This Environmental Appraisal Report (EAR) has been prepared by Arcadis Consulting (UK) Ltd on behalf of National Grid Electricity Transmission plc ('National Grid'), which is proposing overhead line 'tie in' works ('the Scheme') related to the proposed new Long Lane 400kV Substation on land near Brinsworth.
- 1.1.2 The purpose of this EAR is to provide a description of the Scheme, the environmental baseline, the potential for construction and operation phase impacts, and the mitigation and control measures by which construction and operation of the Scheme will be managed.

1.2 Background to the Scheme and its Context

- 1.2.1 The Scheme is located to the east of Brinsworth and south east of Whiston. The location of the land required to construct the Scheme is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 1.2.1. The Scheme is located within the administrative area of Rotherham Metropolitan Borough Council (RMBC).
- 1.2.2 National Grid is proposing to develop a new 400kV substation on land near Long Lane as part of the Brinsworth to Chesterfield reinforcement project ('the Project'), the purpose of which is to reinforce the electricity network, uprating the existing 275kV transmission in between Brinsworth and Chesterfield to operate at 400kV. The Project forms part of the National Grid 'Great Grid Upgrade', which aims to provide additional resilience within the electricity network. The Great Grid Upgrade will enable the electricity grid to carry more clean energy from renewable sources to communities, homes and businesses in every part of England and Wales, helping the UK to reach Net Zero. The proposals will also increase the security and resilience of the UK's electricity network.
- 1.2.3 This report is in relation to the Scheme required to facilitate the Project and the connection of the new 400kV Long Lane Substation to the National Grid network.
- 1.2.4 The Scheme will reinforce the network and also assist in rationalising this part of the transmission system to improve operational flexibility, meet localised demand and address anticipated customer connections in this location.

1.3 Planning Context

- 1.3.1 National Grid has consent from RMBC for the proposed new 400kV Long Lane Substation under the Town and Country Planning Act 1990 (TCPA). A TCPA application was submitted to RMBC in November 2025. Planning permission was granted in August 2026.
- 1.3.2 Consent for elements of the Scheme will be sought under Section 37 of the Electricity Act 1989 from the Secretary of State for Energy Security and Net Zero. National Grid

will also ask for Deemed Planning Consent for works subject of the Section 37 application. The remaining elements of the Scheme will be delivered under a combination of existing rights, exemptions or permitted development, as set out in Chapter 2 of this report. The EAR applies to all aspects of the Scheme, regardless of their consenting route, to ensure a robust consideration of the Scheme with respect to the environment.

Requirement for EIA

- 1.3.3 The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017 (the 'EIA Regulations') define EIA development as either:
- Schedule 1 development, where an EIA is required; or
 - Schedule 2 development likely to have significant effects on the environment by virtue of factors such as its nature, size or location, taking into account the selection criteria set out in Schedule 3, identified through the process of screening.
- 1.3.4 The Scheme does not fall under the activities listed in Schedule 1 of the EIA Regulations, but it does fall under paragraph (3)(b)(ii) of Schedule 2 of the EIA Regulations.
- 1.3.5 The Scheme is located adjacent to a sensitive area as defined by the EIA Regulations, the Medieval Moated Site, Blue Man's Bower, Whiston, which is a scheduled monument under the Ancient Monument and Archaeological Areas Act 1979 and is located partially within the land required to construct the Scheme.
- 1.3.6 An EIA Screening Assessment was undertaken to consider the Scheme in relation to the criteria set out in Schedule 3 of the EIA Regulations. This determined that significant effects on the environment are not likely to occur with the application of appropriate mitigation. A request for an EIA Screening Opinion has been submitted to the Department for Energy Security and Net Zero alongside this EAR, which sets out the measures to be taken to manage construction and operation of the Scheme.

1.4 Stakeholder Engagement

Public Consultation

- 1.4.1 Consultation is ongoing with a variety of different statutory and non-statutory consultees with regards to the Scheme and its potential environmental impacts. National Grid will proactively engage with statutory consultees such as RMBC, Environment Agency, Natural England and Historic England. Non-statutory consultation with the wider public will also be undertaken for the Scheme as part of the Great Grid Upgrade. All matters arising from consultation have been taken into consideration as appropriate as part of the Form B process, which is a mechanism by which the local authorities can make a recommendation on Section 37 applications to the Secretary of State.

1.5 Structure

- 1.5.1 The structure of the EAR is outlined below:

- Chapter 1 Introduction;
- Chapter 2 Scheme Description;
- Chapter 3 Environmental Appraisal;
- Chapter 4 Summary of Impacts and Measures;
- Chapter 5 Planning and Policy; and
- Chapter 6 References.
- Appendix A
Long Lane New Overhead Lines Glossary and Abbreviations;
- Appendix B Methodology;
- Appendix C Long Lane Overhead Works Plans;
- Appendix D Long Lane New Overhead Lines Drawings;
- Appendix E
Long Lane New Overhead Lines Type 1 Photographic Survey;
- Appendix F Noise Impact Assessment;
- Appendix G Construction Dust Assessment and Methodology;
- Appendix H Arboricultural Survey Report;
- Appendix I Excerpts from Appendix F of the new 400kV Long Lane Substation Environmental Appraisal Report;
- Appendix J
Long Lane Breeding Bird Report;
- Appendix K Flood Risk Assessment; and
- Appendix L Outline Soil Management Plan.

1.6 The Team

- 1.6.1 The environmental appraisal has been compiled by Arcadis Consulting (UK) Ltd. In addition to the team preparing the EAR, National Grid, Jacobs, WSP, Laing O'Rourke, M Group and JBP Consulting Limited have contributed to the preparation of this EAR and have provided information that has been used in the EAR.

2. Scheme Description

2.1 Introduction

- 2.1.1 This chapter of the EAR provides a description of the Scheme and forms the basis of the appraisal presented in Chapter 3. It provides an overview of the land required to construct the Scheme, a description of the layout and physical characteristics of the Scheme and the land use requirements during the construction and operational phases of the development. This chapter also describes the construction programme and anticipated construction activities.
- 2.1.2 All dimensions described are approximate.

2.2 Existing Site and Surroundings

- 2.2.1 The overhead lines shown in Appendix C, Long Lane Overhead Works Plans, illustrate the extent of the Scheme, located to the east of Brinsworth, south of Rotherham. The red line boundary shows the location of the new 400kV substation. Post construction, any remaining areas of land only temporarily required would be restored to their former land use.
- 2.2.2 Currently, the land required to construct the Scheme predominantly comprises agricultural fields. The land required to construct the Scheme is bound to the north by woodland and Whiston Brook, with agricultural fields and residential development beyond. The land required to construct the Scheme extends to the existing Brinsworth Substation to the west. The Scheme crosses a section of the M1 and extends south. The land required to construct the Scheme is predominantly surrounded by agricultural land, the M1, Brinsworth to the west and Whiston to the north east.
- 2.2.3 The topography is undulating and predominantly characterised by agricultural land use with vegetated borders and hedgerows. An existing transmission substation exists to the west. Pylons associated with this substation are visible in the area.
- 2.2.4 One LWS, Whiston Meadows, sits partially within the west of the land required to construct the Scheme.
- 2.2.5 There is one statutory designated site for nature conservation within 2km of the land required to construct the Scheme, which is Catcliffe Flash Local Nature Reserve (LNR) and Local Wildlife Site (LWS) located approximately 0.74km south west of the Scheme. In addition to Catcliffe Flash, there were 12 non-statutory sites located within 2km of the land required to construct the Scheme, comprising nine LWS and three candidate Local Wildlife Sites (cLWS) (see Section 3.2 Ecology).
- 2.2.6 The Site is not located within areas designated nationally or locally for their landscape. There are no National Landscapes or National Parks within 2km of the Site. There are a number of residential receptors in proximity to the land required to construct the Scheme (see Section 3.3 Landscape and Visual).
- 2.2.7 There are two scheduled monuments (SMs) located within 500m of the land required to construct the Scheme: Blue Man's Bower moated site (SM1) located partially within

the land required to construct the scheme and Canklow Hill earthworks (SM2) located within the 500m study area. There are 14 listed buildings located within 500m of the land required to construct the Scheme; of these, six (LB1-6) are located within Whiston Conservation Area (CA1) (see Section 3.4 Cultural Heritage).

- 2.2.8 Whiston Brook, also a Main River, is located within Whiston Meadows LWS.
- 2.2.9 The majority of the Site is within the former Rotherham Air Quality Management Area (AQMA) Part 1, revoked in 2025. This AQMA had been declared for Nitrogen Dioxide (NO₂), with the source transport and industrial (see Section 3.3.5)
- 2.2.10 There are no Noise Important Areas within the land required to construct the Scheme; the closest are to the east, associated with the A618 and M1 close to Guilthwaite (see Section 3.8 Noise and Vibration).
- 2.2.11 The PRoWs in the vicinity of the land required to construct the Scheme are shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route. There are nine PRoWs within the land required to construct the Scheme:
- Whiston footpath no.7 spans primarily in the south west – north east direction connecting Pleasley Road in the north east and intersecting Long Lane to the south west.
 - Whiston footpath no.9 connects to Whiston footpath no.7 to the west of where it intersects Long Lane and spans north west before heading north east to connect onto the A631 West Bawtry Road.
 - Whiston footpath no.10 spans in the north west – south east direction and connects to Whiston footpath no.12 at its south eastern end.
 - Whiston footpath no.12 spans in the south west – north east direction connecting Long Lane to The Green, whilst intersecting Pleasley Road to the south of Whiston footpath no.7. The south eastern end of Whiston footpath no.10 meets the middle of Whiston footpath no.12 within the land required to construct the Scheme in its upper central area.
 - Whiston footpath no.13 connects Whiston footpath no.12 to Pleasley Road in a north west – south east direction.
 - Treeton footpath no.1 is a continuation of Whiston footpath no.7 to its south west and continues south west to Flatts Lane, where it connects to Treeton footpath no.2.
 - Treeton footpath no.4 connects Pleasley Road in the north east to Bole Hill in the south west.
 - Whiston footpath no.15 connects Pleasley Road in the south west to Doles Lane in the north east.
 - Treeton footpath no.2 connects Long Lane in the east and Flatts Lane to the west, where Flatts Lane provides construction traffic access rights to the Scheme.
- 2.2.12 There are a further 14 footpaths and one bridleway located within 500m of the land required to construct the Scheme.

2.3 The Scheme

- 2.3.1 The Scheme is composed of several elements, set out below, to enable the connection of the new 400kV substation at Long Lane (which was screened as a non-EIA project and subject to a separate TCPA application) to the Project and the wider network. This will comprise the installation of short stretches of overhead line between the new Long Lane 400kV Substation and the existing overhead line network, as well as the removal of some existing stretches of overhead line, together with the temporary works (such as temporary masts) required to make these permanent changes.

Consenting the Scheme

- 2.3.2 Certain elements require consent under Section 37 of the Electricity Act 1989 (as amended) where they fall outside permitted development or National Grid land ownership boundaries, or where an exemption does not apply under the Overhead Lines (Exemption) (England and Wales) Regulations 2009 ('Exemption Regulations'). This includes:
- permanent tie in works and overhead line installations that exceed exemptions or fall outside National Grid land ownership;
 - permanent turn-ins and modifications to overhead line alignment that are not within National Grid land ownership or are not classed as repair/renewal; and
 - any temporary diversions requiring longer than six months where the exemption is not applicable.
- 2.3.3 Temporary overhead line works that meet the exemption criteria may proceed under the Exemption Regulations without a Section 37 consent, subject to the following limits:
- temporary overhead lines not exceeding 850m in aggregate length;
 - time-limited (not exceeding six months per exemption); and
 - temporary diversions that remain within the exemption thresholds and do not involve position changes that negate the exemption.
- 2.3.4 These exemptions apply only where the temporary lines stay within the 850m limit and meet all other exemption criteria; they do not apply if the temporary line is in a different position from existing lines, or would exceed height limits.
- 2.3.5 Section 37(2)(b) provides that Section 37(1) will not apply in relation to so much of an electric line as is or will be within premises in the occupation or control of National Grid. The effect of Section 37(2)(b) would be to remove the need for consent under Section 37(1) for the installation of electric lines within land occupied and controlled by National Grid. Where Section 37(1) does not apply to electric line works by virtue of Section 37(2)(b), this means that National Grid can carry out certain overhead line works as permitted development under Class B(a) of Part 15 of The Town and Country Planning (General Permitted Development) (England) Order 2015, including:
- construction of short overhead line sections and installation of new terminal/pylon structures within National Grid land ownership; and
 - replacement/repair/renewal works to existing overhead lines that do not increase height beyond current structures and remain within National Grid land ownership.

Scheme Elements

2.3.6 The overhead line ‘tie in’ works at Long Lane which comprise the Scheme include the following elements:

- Section 37 Consent:
 - Installation of approximately 685m of new permanent overhead line, including two new pylons (4ZV188 and 4ZV189), all to the south of the new 400kV substation. This requires Section 37 consent.
 - Installation of 753m of new temporary overhead line, to the south of the new 400kV substation (Brinsworth to Thorpe Marsh). This requires Section 37 consent.
- Section 37 Exemption/permitted development:
 - Installation of approximately 614m of temporary overhead line, in two sections to the north and north west of the new 400kV substation (Brinsworth to Thorpe Marsh), and one temporary structure (4ZH115T), in place for more than six months. This is exempt under Regulation 3(1)(c) of The Overhead Lines (Exemption) (England and Wales) Regulations 2009 from the requirement for Section 37 consent.
 - Installation of 140m of new permanent overhead line, to the north west of the new 400kV substation (Brinsworth to Brinsworth 1 and 2). This is exempt under Regulation 3(1)(c) of The Overhead Lines (Exemption) (England and Wales) Regulations 2009 from the requirement for Section 37 consent.
 - Installation of a 736m of permanent overhead line under permitted development rights (Brinsworth B – Chesterfield 1 and 2, Brinsworth B to Thorpe Marsh 1 and 2, and Brinsworth to Brinsworth B1 and B2) and the temporary installation of 220m of temporary overhead line (Brinsworth B to Thorpe Marsh 1). These permanent and temporary works do not require Section 37 consent by virtue of Section 37(2)(b) as they are works carried out within National Grid’s land ownership. Therefore, as the works do not require Section 37 consent, they are permitted development under by Class B(a) of Part 15 of The Town and Country Planning (General Permitted Development) (England) Order 2015.
 - Removal of approximately 2.1km of existing overhead line, in two sections, predominantly to the north, west and south west of the proposed new 400kV Long Lane Substation, and the removal of pylons between 4ZV187T to 4ZV193 (between Brinsworth and Chesterfield 1 and 2) and between 4ZH113T to 4ZH114T (between Brinsworth and Thorpe Marsh 1 and 2). This does not require Section 37 consent.

2.4 Construction Phase

2.4.1 This section sets out the construction programme and outlines the key assumptions that have been made within the EAR with regards to the construction approach and working methods for the Scheme.

Construction Environmental Management Plan

- 2.4.2 Construction of the Scheme will be managed in line with a Construction Environmental Management Plan (CEMP) informed by the appraisal and control measures set out in this EAR. This will also include managements plans relating to the management of construction traffic, and materials and waste.
- 2.4.3 The purpose of the CEMP is to identify potential adverse environmental issues arising from the construction of the Scheme, to specify measurable limits and targets, and to detail the mitigation measures to be undertaken during construction and the management tools and procedures required. The CEMP will therefore provide an operational manual detailing the management, monitoring, auditing and training procedures to be followed during the construction of the works to ensure compliance with relevant legislation. It will also set out the specific roles and responsibilities of the Contractors and wider project team personnel. The CEMP will include, but not be limited to, the following:
- available details regarding the phasing of works;
 - details of the works to be undertaken highlighting any operations likely to result in adverse environment impacts, with an indication of the specific detailed mitigation measures to be employed;
 - prohibited or restricted operations;
 - a framework for compliance with relevant legislation and guidance;
 - details of plant to be used;
 - construction working hours including any weekend or public holiday works proposed and, if so, their working hours;
 - roles and responsibilities of key staff including training of staff, liaison with stakeholders and management of enquiries and complaints;
 - details of emergency procedures to be implemented on the site;
 - details of general site management practices, including working hours, hoarding, access, lighting, site facilities, energy and water use, waste, materials procurement and storage;
 - details of environmental management and control procedures, covering ecology, traffic and access, noise and vibration, dust, contamination, hazardous materials, drainage and pollution control;
 - requirements for auditing, monitoring and record-keeping;
 - mechanisms for third parties to register complaints and the procedures for responding to complaints; and
 - provisions for reporting, public liaison and prior notification, especially where dispensations will be required.
- 2.4.4 All proposed control and mitigation measures relating to the construction phase identified in Chapter 3 of this EAR will be included within the CEMP.

Construction Activities

- 2.4.5 The works required to construct the Scheme will include:

- installation of haul road;
- laydown/working platforms around existing pylons and proposed pylon locations;
- conductor/earth wire pulling;
- installation of new permanent structures;
- dismantling of existing structures;
- installation of temporary structures;
- erection and use of scaffolding; and
- laydown areas.

- 2.4.6 Pre-commencement works will consist of vegetation clearance where necessary to enable the construction works undertaken in line with the CEMP.
- 2.4.7 The working areas associated with the provision of new temporary and permanent structures will be fenced and secured during construction only. The working area at each new pylon location will generally be stoned similarly to the stone access roads, to accommodate the crane pad required for pylon installation.
- 2.4.8 The construction of the foundations for new pylons will be of mass concrete design or piled, depending on geotechnical conditions. Mechanical excavators will dig excavations of sufficient size for the foundations in the shape of a pyramid; or temporary sheet piles will be installed to support the ground depending on the size of the foundation. Subsoil and topsoil will be stored separately and in accordance with the CEMP. The dimensions of the excavation will differ, depending on the type of pylon to be installed, but will typically be no greater than 5m x 5m x 5m. Upon excavation for all four leg foundations, steel stubs will be suspended from a template to achieve the correct dimensions and rake for each leg of the pylon. All excavations will be fenced for protection and the foundations concreted in position using specially designed formwork.
- 2.4.9 Concrete will be delivered by ready-mixed concrete truck. After 48 hours, the formwork will be removed, and the excavations backfilled and consolidated.
- 2.4.10 Steelwork members of the new pylon will be delivered to site by lorry. The assembly of the pylon will commence at ground level and would proceed as far as possible until a crane is necessary to enable assembly to continue. Sections of the pylon will be erected at ground level and then craned into position and bolted on to the lower section of the pylon. Anti-climbing guards will be fitted and maintained from an early stage of pylon erection.
- 2.4.11 Where pylons are to be removed, the existing conductors will be unclamped and placed in rollers. The tension of the line will then be released, and the conductors lowered to the ground where they will be cut into manageable lengths, coiled and removed for recycling at a suitable facility. The insulator strings and other line fittings will be removed from each pylon. All these items will be removed for recycling. The pylons will be cut into manageable sections and the steelwork removed from site to be recycled. The foundations of each redundant pylon will be excavated, and the concrete and stub foundations removed from the site.

Construction Programme

2.4.12 The indicative construction and commissioning stage will consist of the following phases:

- July 2027 to June 2028 – installation of foundation;
- June 2028 to October 2028 – pylon construction;
- November 2028 to October 2030 – overhead line installation works; and
- October 2030 to June 2031 – reinstatement, close out and demobilisation.

Working Hours

2.4.13 Typical working hours are likely to be 8am to 6pm on Monday to Friday, except during system outages, and 9am to 1pm on Saturday. System outages are assumed to be permitted only from the end of March to the end of October (standard summer working). During outages, some additional weekend working may be required. Construction of new access points to the public highway and associated traffic management may also be undertaken outside typical working hours.

2.4.14 Any works proposed outside the hours specified above are to be agreed with RMBC prior to any of the proposed works being carried out.

Site Access and Routes

2.4.15 Site access will make use of existing access routes/tracks, where practical. Where new temporary access routes are required to reach working areas, these will generally be stoned. During construction, access will be required to the land required to construct the Scheme from:

- A618 Pleasley Road at Guilthwaite;
- A618 Pleasley Road opposite Ulley Reservoir;
- Long Lane opposite the water treatment works at Treeton;
- Long Lane south of the M1;
- Flatts Lane;
- Haworth Lane, off West Bawtry Road; and
- Long Lane, opposite Whiston Meadows.

2.4.16 Following construction, the temporary stoned access routes will be removed, and any vegetation removed for their installation/removal will be reinstated.

2.5 Operational Phase

2.5.1 The following table sets out the dimensions of the new pylons proposed as part of the Scheme.

Table 2.5.1 Pylon specifications

Pylon reference	Section 37 Consent/ Exemption/ Permitted Development	Pylon Height (m)	Base Footprint (sq m)	Foundation Footprint (m)
4ZH112B	Permitted Development Rights	49	13	4m x 4m pad @ 3m depth
4ZH112C	Permitted Development Rights	59	19	5m x 5m pad @ 5m depth
4ZH113	Permitted Development Rights	59	19	5m x 5m pad @ 5m depth
4ZH114	Exemption Regulations 2009	58	20	4m x 4m pad @ 3m depth
4ZH115T	Exemption Regulations 2009 (temp)	58	20	4m x 4m pad @ 3m depth
4ZV187	Exemption Regulations 2009	58	16	5m x 5m pad @ 5m depth
4ZV186T	Section 37 (temp)	58	20	4m x 4m pad @ 3m depth
4ZV188	Section 37	51	15	4m x 4m pad @ 4m depth
4ZV189	Section 37	58	20	4m x 4m pad @ 3m depth
4ZV190	Permitted Development Rights	59	19	5m x 5m pad @ 5m depth

Access

- 2.5.2 There will be no permanent access routes provided as part of the Scheme. However, National Grid will retain rights of access for repair and maintenance.

3. Environmental Appraisal

3.1 Introduction

- 3.1.1 This chapter details the baseline conditions and the environmental appraisal of potential environmental impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures to reduce or avoid these impacts are prescribed for each environmental topic below.
- 3.1.2 This report should be read in conjunction with the appendices set out in Section 1.5.

3.2 Ecology

Introduction

- 3.2.1 This section details the Ecology baseline conditions and the environmental appraisal of the potential Ecology impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.2.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; Appendix D, Long Lane New Overhead Lines Drawings; Appendix I, Excerpts from Appendix F of the new 400kV Long Lane Substation Environmental Appraisal Report; and Appendix J, Long Lane Breeding Bird Report.

Study Area

- 3.2.3 The study area comprises the land required to construct the Scheme, plus a 10km search area for International or European statutory designated sites, and a 2km search area for other statutory designated sites, non-statutory designated sites, protected and notable species, Invasive Non-Native Species, and granted European Protected Species Mitigation (EPSM) licences within the last decade. A very small section of the 2km radius of the west falls within the Sheffield district boundary (approximately at 1.9km west), however due to this being a very minor extent it was concluded that any additional data from Sheffield would not impact the outcomes and recommendations within this report therefore a separate desk study was not requested.

Consultation

- 3.2.4 Table 3.2.1 provides a summary of the issues raised and agreed during Form B consultation with respect to ecology and the Scheme and how they have been addressed.

Table 3.2.1 Summary of consultation

Consultee/Date	Summary of Issues Raised/Agreed
Natural England 14 July 26	Natural England confirmed that the development is not close to or within a Habitats Site, Site of Special Scientific Interest (SSSI) or protected landscape and that they have no comments to make on this consultation.
Rotherham Metropolitan Borough Council 2 Sept 26	Requested further ecological information, such as surveys and appraisal, which are set out in this EAR.

Baseline

3.2.5 This section details the baseline sites or features of particular nature conservation interest in relation to the Scheme. The locations of the ecological features confirmed as present across the Scheme and within the immediate vicinity are presented in Appendix D, Long Lane New Overhead Lines Drawings of this EAR:

- Figure 3.2.1 Designated Sites;
- Figure 3.2.2 Habitats of Principal Importance
- Figure 3.2.3 Phase 1 Habitat Plan;
- Figure 3.2.4 Pond Location Map; and
- Figure 3.2.5 Bat Potential Roost Feature Tree Locations Map.

Designated Sites

- 3.2.6 There were no internationally designated sites identified within 10km of the land required to construct the Scheme including Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites.
- 3.2.7 There is one statutory designated site for nature conservation within 2km of the land required to construct the Scheme, which is Catcliffe Flash Local Nature Reserve (LNR) and Local Wildlife Site (LWS) located approximately 0.74km south west of the Scheme. In addition to Catcliffe Flash, there were 12 non-statutory sites located within 2km of the land required to construct the Scheme, comprising nine LWS and three candidate Local Wildlife Sites (cLWS). These are listed in Table 3.2.2.
- 3.2.8 One LWS, Whiston Meadows, sits partially within the west of the land required to construct the Scheme as seen on Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.2.1.
- 3.2.9 Table 3.2.2 summarises the potential for the Scheme to impact the recorded statutory and non-statutory designated sites within their relevant Zone of Influence (Zoi). Sites which require further consideration in this appraisal have been identified and can be found in Appendix D High Marnham New Overhead Lines Drawings; Figure 3.2.1.

Table 3.2.2 Locally designated sites within the study area

Site name and designation	Distance from land required to construct the Scheme	Reason for designation
Statutory		
Catcliffe Flash LNR	Approximately 760m south west from the land required to construct the Scheme	<p>Catcliffe Flash is an open water washland site formed by subsidence and surrounded on three sides by willow carr and reed-bed. Within the boundaries of Catcliffe Flash can be seen the varying degrees of sere succession, from the deep water area in the centre, to the shallow silt areas of the 'drawdown' areas which frequently dry out in summer, through to the marsh areas and finally into the wet willow/alder (<i>Alnus glutinosa</i>) carr that becomes progressively drier towards the periphery. Such a variety of freshwater habitats makes Catcliffe Flash one of the most species-rich sites in the Rother Valley. Habitats include neutral grassland, rich fen and wet woodland.</p> <p>The site supports breeding populations of gadwall (<i>Anas strepera</i>), teal (<i>Anas crecca</i>), shoveler (<i>Anas clypeata</i>) and reed bunting (<i>Emberiza schoeniclus</i>), and a wintering wildfowl assemblage. The rare whirligig beetle (<i>Gyrinus distinctus</i>) and additionally cornflower (<i>Centaurea cyanus</i>) have been recorded within the site.</p>
Non-Statutory		
Whiston Meadows LWS	Within and to the north	<p>This is a small site in the wooded valley of the Whiston Brook consisting of a complex of wetlands and damp grasslands and drier grass and woodland areas, surrounded by rolling farmland. Amenity grasslands in the east progress gradually into a 'wilder' west area, serving as a 'buffer' between the urban (Whiston village) and rural areas.</p> <p>The principal habitat types identified within the site comprise:</p> <ul style="list-style-type: none"> • G3 – acid grassland; • W3 – acid woodland; • G2 – wet grassland; • RI1 – flowing water; and • SW1 – standing water.
Burnt Wood LWS	Adjacent south east direction	<p>Burnt Wood has a bluebell (<i>Hyacinthoides non-scripta</i>)-dominated ground flora. The soil is poor, sandy and acidic, so quite well drained. The site is generally fairly open; in the east corner is a plantation, but the majority of the wood is oak with</p>

Site name and designation	Distance from land required to construct the Scheme	Reason for designation
		beech (<i>Fagus sylvatica</i>). The wood contains some good old trees, aged 100–150 years. Monk's-hood (<i>Aconitum napellus</i>) has been recorded within the site.
Old Flatts Farm Marsh LWS	Approximately 10m south west	The site consists of marshland with a diverse range of communities within a small area. The site is permanently waterlogged by ground water, with alluvial soils leading to mesotrophic conditions and therefore moderate species diversity over the stand as a whole. Previously considered to be the most complete natural marsh in Rotherham, despite its compact size; since the closure of Treeton Colliery, water quality and levels have been poor.
Old Flatt's Farm Marsh (extension) cLWS	Approximately 10m south west	Not available.
Revel Wood LWS	Approximately 20m north east	Small sessile oak (<i>Quercus petraea</i>) - hazel (<i>Corylus avellana</i>) ancient woodland on a steeply-sloping site. The habitats present are typical of the acid soils present. A watercourse forms the southern boundary for much of the site before flowing north west to meet Whiston Brook.
Canklow Wood LWS	Approximately 20m north west	Canklow Wood is characterised by ancient mature oak (<i>Quercus</i> sp.) woodland, young developing oak-birch (<i>Betula pendula</i>) woodland and large areas of more open acid grassland with heathland habitats present. The site is locally important for waxcaps (<i>Hygrocybe</i> sp.).
Ulley Country Park LWS	Approximately 20m south east	This site comprises Ulley Reservoir and surrounding woodland and fields. Habitats include neutral, acid and wet grassland, heathland, and acid and wet woodland. There are breeding populations of song thrush (<i>Turdus philomelos</i>), willow tit (<i>Parus montanus</i>), tree sparrow (<i>Passer montanus</i>), bullfinch (<i>Pyrrhula pyrrhula</i>) and yellowhammer (<i>Emberiza citrinella</i>). Water vole (<i>Arvicola amphibius</i>) is present within the site and four waxcaps have been recorded.
Treeton Colliery LWS	Approximately 55m south west	Treeton Colliery includes the former colliery spoil tip, with semi-natural neutral, calcareous and acid grassland habitats typical of poor soil and formed ground.

Site name and designation	Distance from land required to construct the Scheme	Reason for designation
Treeton Wood LWS	Approximately 364m south	Upland sessile oak (<i>Quercus petraea</i>)-birch (<i>Betula</i> spp.) woodland with a narrow strip of western valley ash (<i>Fraxinus</i> spp.)-wych elm (<i>Ulmus glabra</i>) along the north-east half of the south-east side. Sessile oak tends to grow taller than the birches, creating a more uneven structure. Sycamore (<i>Acer pseudoplatanus</i>) and beech (<i>Fagus sylvatica</i>), where present, occur more frequently as mature trees. Crab apple (<i>Malus sylvestris</i>) also occurs, but rarely. Holly (<i>Ilex aquifolium</i>) dominates the shrub layer with young common whitebeam (<i>Sorbus aria</i>) and hawthorn (<i>Crataegus monogyna</i>) occasional. The field layer appears to vary with past management and physical features. A good example of elm (<i>Ulmus</i> spp.), ash (<i>Fraxinus excelsior</i>) and hazel (<i>Corylus avellana</i>) occurs alongside the stream.
Treeton Biffa Tip (extension) cLWS	Approximately 385m south west	Not available.
Treeton Dyke LWS	Approximately 750m south west	This site contains a range of habitats within a small area forming a 'natural' enclave of attractive countryside adjacent to industrial development and close to the conurbations of Treeton, Aughton, Swallownest and Fence. The whole area has significant wildlife interest and is a prime bird-watching site, especially parts of Forgemasters tip, the marsh to the north-west of Hail Mary Hill and the south arm of the Dyke; these relate to the variety of habitats present and least physical disturbance.
Waverly Lakes (b) Extension cLWS	Approximately 1.6km south-west	Not available.
Waverly Lakes (b) cLWS	Approximately 1.7km south-west	Not available.

Habitat Survey

- 3.2.10 The full extent of the Scheme has not been surveyed, due to lack of access to certain land parcels (some access tracks, two small parcels in the south west of the Scheme, and one small parcel to the east). This lack of data is unlikely to affect the recommendations or appraisal of impacts from the Scheme as a whole. The Phase 1 Habitat Plan can be found in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.2.3.
- 3.2.11 The desk study identified eight Habitats of Principle Importance (HPIs). There is one area of wood-pasture and parkland priority habitat (consisting of four parcels), located 1.3km north west of the Scheme. There were four areas of traditional

orchard, the closest of which was located 1.1km north east of the Scheme. There were 35 areas of deciduous woodland (consisting of 112 parcels), the closest of which was located inside the land required to construct the Scheme. Three areas of ancient woodland were identified, consisting of six parcels, the closest of which was located 20m north east of the land required to construct the Scheme. One priority pond was identified, 1.7km south west of the land required to construct the Scheme. There were two areas of priority reedbed identified, the closest of which was located 650m south west of the land required to construct the Scheme. Two areas of good quality semi-improved grassland were located (consisting of seven parcels), the closest of which was located 1.2km south east of the land required to construct the Scheme. There were two areas of coastal and floodplain grazing marsh (consisting of 12 parcels), the closest of which was located within the land required to construct the Scheme.

- 3.2.12 The data search returned 10 Local Biodiversity Action Plan (LBAP) habitat types within 2km of the land required to construct the Scheme. This included mixed ash woodland, fen, heathland, neutral grassland, oak birch woodland, ponds and lakes, reedbeds, rock exposure, traditional orchard and wet woodland. Areas of neutral grassland, oak birch woodland and wet woodland intersect with parts of the land required to construct the Scheme in the north and south west.
- 3.2.13 The following habitats have been identified within the land required to construct the Scheme:
- Scrub:
 - Several patches of dense scrub were recorded along the north of the Scheme, these comprised elder (*Sambucus nigra*), cherry (*Prunus* sp.), hawthorn (*Crataegus monogyna*), rowan (*Sorbus aucuparia*), bramble (*Rubus fruticosus*), common nettle (*Urtica dioica*), dogwood (*Cornus sanguinea*) and silver birch (*Betula pendula*).
 - There were seven areas of scattered scrub, located along the north of the land required to construct the Scheme, primarily comprised of hawthorn, elder and bramble.
 - Grassland:
 - Improved grassland was found in multiple land parcels across the land required to construct the Scheme, particularly in the east, west and south, and comprised common dominant grass species such as Yorkshire fog (*Holcus lanatus*), perennial ryegrass (*Lolium perenne*), cocksfoot (*Dactylis glomerata*), dandelion (*Taraxacum officinale*), ribwort plantain (*Plantago lanceolata*), white clover (*Trifolium repens*) and herb Robert (*Geranium robertianum*).
 - Multiple parcels of semi-improved neutral grassland are present within the west of the land required to construct the Scheme, particularly the fields near to Blue Man's Bower. These parcels comprised Yorkshire fog (*Holcus lanatus*), creeping thistle (*Cirsium arvense*), creeping buttercup (*Ranunculus repens*), ribwort plantain (*Plantago lanceolata*), dandelion and broadleaved dock (*Rumex obtusifolius*). Much of Whiston Meadows LWS comes under this habitat type.
 - There is one area of managed amenity grassland at the north west tip of the land required to construct the Scheme, comprising bent (*Agrostis* sp.), Yorkshire fog and cocksfoot.

- Cultivated/disturbed land – arable:
 - There are 10 parcels of arable land within the land required to construct the Scheme, comprising predominantly fallow fields with dominating species comprising thistle and ryegrass ley. Non-fallow fields comprised sunflower and corn crop. The margins did not meet the definition of the Arable Field Margins Habitats of Principal Importance in England (HPIE).
- Hedgerows:
 - There are three intact species-rich hedgerows and two defunct species-rich hedgerows intersecting the land required to construct the Scheme. One intact hedgerow south of the land required to construct the Scheme now consists of primarily mature trees such as hawthorn, ash (*Fraxinus excelsior*), field maple (*Acer campestre*), cherry, hazel (*Corylus avellana*), willow (*Salix* sp.) and *Prunus* sp. and merges into the adjacent woodland. Another intact hedgerow bordering west of the land required to construct the Scheme also consists of mature trees such as blackthorn (*Prunus spinosa*), hazel, field maple, elder and horse chestnut (*Aesculus hippocastanum*). Species of the third intact hedgerow comprised hawthorn, blackthorn, hazel, elder and crab apple (*Malus sylvestris*). Species of the defunct hedgerows comprised holly (*Ilex aquifolium*), hawthorn, ash, dog rose (*Rosa canina*), willow, elder, blackthorn, hazel, goat willow (*Salix caprea*), wych elm (*Ulmus glabra*) and pedunculate oak (*Quercus robur*).
 - There are nine intact species-poor hedgerows and three defunct species-poor hedgerows intersecting the land required to construct the Scheme to the north, east, centre and south of the Scheme. Species comprised hawthorn, sycamore (*Acer pseudoplatanus*), elder, ash, oak (*Quercus* sp.), holly, dog rose, field maple, bramble and hazel.
 - There are four species-rich hedgerows with trees to the north, east and centre/south and three species-poor hedgerows with trees to the north-east and north-west intersecting the land required to construct the Scheme. Species within species-rich hedgerows comprised hawthorn, ash, sycamore, field maple, hazel, elder, red currant (*Ribes rubrum*), alder, poplar (*Populus* sp.), blackthorn, birch, holly, dog rose, grey willow (*Salix cinerea*), guelder rose (*Viburnum opulus*) and pedunculate oak. Species within species-poor hedgerows comprised hawthorn, rowan, sycamore, elder and ash.
 - All hedgerows within the land required to construct the Scheme consisted predominantly (i.e. 80% or more cover) of at least one woody UK native species and, as such, met the definition of hedgerow HPI. Hedgerows are also Rotherham Biodiversity Action Plan habitats.
- Other tall ruderal:
 - There are four parcels in the north west of the land required to construct the Scheme, within the fields adjacent to Blue Man's Bower and one small patch of ruderal herbs under a pylon to the west of the Scheme. Species comprised common nettle, thistle (*Cirsium* sp.), ragwort (*Jacobaea vulgaris*), Himalayan balsam (*Impatiens glandulifera*) and common hogweed (*Heracleum sphondylium*).

- Woodland:
 - There are four areas of broadleaved semi-natural woodland; these are located all within the northern extent of the land required to construct the Scheme, north and south of Blue Man's Bower and on the M1 motorway embankment. The parcel south of Blue Man's Bower was wet at the time of survey in 2023 and located on an Oxbow pond. Species comprised ash, hawthorn, willow, crab apple, oak, hazel, poplar, common nettle and bramble.
 - Three areas of woodland broadleaved plantation intersect the centre of the land required to construct the Scheme, adjacent to the M1 motorway embankment. Species comprise willow, cherry, ash, sycamore, field maple, hawthorn, dog rose, crack willow (*Salix fragilis*), Japanese lantern (*Physalis alkekengi*) and common nettle.
- Scattered trees:
 - There were five individual rural trees located to the north of the land required to construct the Scheme. One was a broadleaved rowan, and the remaining four were comprised of two fir species (*Abies* sp.) and two Scots pine (*Pinus sylvestris*).
 - There were four lines of trees: one running along Ulley Brook, one east of Burnt Wood to the south of the land required to construct the Scheme, and two to the north of the land required to construct the Scheme. Species comprised oak, fir, alder, horse chestnut and sycamore.
- Rivers and streams:
 - There were six areas of running water recorded across the land required to construct the Scheme. These comprised the River Rother in the west of the land required to construct the Scheme; Ulley Brook, which runs from the M1 to the south of the land required to construct the Scheme and was recorded as fast flowing and turbid, and flooded at the time of survey, with banks ranging from gentle to 45 degrees; and a further stream in the south of the Scheme running adjacent to Ulley Brook, which was slow flowing, turbid and flooded at the time of survey, with gentle to 45 degree banks well vegetated with grasses and tall herbs. Two small streams were also recorded within fields near Blue Man's Bower in the west of the land required to construct the Scheme, one of which was fast flowing and flooded at the time of survey. Vegetation comprised bullrush (*Typha* sp.), duckweed (*Lemna minor*), bramble, tall ruderals, reed canary grass (*Phalaris arundinacea*), Himalayan balsam, alder and hawthorn.
- Cultivated/disturbed land – ephemeral/short perennial:
 - There was one parcel of ephemeral land, located in the centre of the land required to construct the Scheme. Species consisted of groundsel (*Senecio vulgaris*), greater willowherb (*Epilobium hirsutum*), spiny sowthistle (*Sonchus asper*), cut-leaved cranesbill (*Geranium dissectum*), lesser swine-cress (*Lepidium didymum*), field speedwell (*Veronica persica*) and bristly ox-tongue (*Helminthotheca echioides*).
- Ditches:
 - There were five recorded ditches at the north west of the land required to construct the Scheme, four of which were recorded as standing water.

Species comprised reed and Himalayan balsam. One standing water ditch was clear, but the remaining three had high turbidity.

- The one running ditch was classed as a slow flowing drain at the time of survey and may be dry during summer. The banks are well vegetated, comprising primarily common nettle, grasses and ruderals, and are suitable for water vole burrowing. The drain culverts under the motorway.
- Dry ditch:
 - A dry ditch runs along the base of one of the hedgerows located to the south of the land required to construct the Scheme. The ditch is approximately 50cm wide x 20cm deep and lacked vegetation indicative of regular flooding. The vegetation in the ditch comprised predominantly common nettle.

Protected and notable species

Plants

- 3.2.14 The desk study returned 27 records of five protected and/or notable plant species. The closest records were of bluebell (*Hyacinthoides non-scripta*) which is located approximately 480m west of the land required to construct the Scheme. The other notable species was Scots pine. There were no records of protected/notable plant species within the land required to construct the Scheme.

Invasive Non-Native Species (INNS)

- 3.2.15 Two areas of Himalayan balsam (*Impatiens glandulifera*) were noted to the north west, within the land required to construct the Scheme, in several large patches, along the border of the streams within Whiston Meadows LWS, the border of the River Rother and within the woodland to the north of the land required to construct the Scheme. Himalayan balsam was also noted in the desk study as being present within 2km of the land required to construct the Scheme, within Whiston Meadows LWS.

Invertebrates

- 3.2.16 The desk study returned 465 records of seven notable invertebrate species. The closest was a record of cinnabar moth (*Tyria jacobaeae*) located approximately 70m south east of the land required to construct the Scheme.
- 3.2.17 The habitats on Site offer potential to support a limited assemblage of common and widespread invertebrate species. The likelihood that the Scheme supports notable and/or protected species or a significant assemblage of invertebrate species considered to be negligible.

Fish

- 3.2.18 The desk study returned no records of protected and/or notable fish species.
- 3.2.19 The River Rother runs through the land required to construct the Scheme and is suitable to support protected/notable species of fish.

Amphibians

- 3.2.20 In June 2026, Habitat Suitability Index (HSI) surveys were carried out of all waterbodies identified within 250m of the land required to construct the Scheme and confirmed as ponds during the field survey. The locations of the ponds assessed can be found in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.2.4.
- 3.2.21 The desk study returned six records of amphibians, four smooth newt (*Lissotriton vulgaris*), one common frog (*Rana temporaria*) and one great crested newt (*Triturus cristatus*), the closest record was of common frog located approximately 540m south of the land required to construct the Scheme. The record of great crested newt was approximately 1.87km south west of the land required to construct the Scheme.
- 3.2.22 One pond was located within the land required to construct the Scheme, however this was dry at the time of survey (pond 7). An additional nine ponds are located within 250m of the land required to construct the Scheme. Ponds 4-9 were all dry at the time of survey in 2026, and were therefore scoped out. Ponds 1-3 and pond 10 were wet and had suitability for great crested newt. HSIs assessments were carried out on all suitable ponds following the surveys. The closest suitable pond was 75m south east of the Scheme.
- 3.2.23 The HSI assessment returned the results as set out in Table 3.2.3 below to support great crested newt.

Table 3.2.3 Long Lane HSI results table based on ARG UK Advice Note 5

HSI parameters	Pond 1	Pond 2	Pond 3	Pond 10
Geographic location	1	1	1	1
Pond area	0.95	0.2	1	1
Pond permanence	0.5	0.5	0.5	0.9
Water quality	0.67	0.67	0.67	0.33
Shade	1	1	0.5	1
Waterfowl effect	1	1	1	0.01
Fish presence	1	0.67	0.67	0.67
Pond density	0.55	0.55	0.55	0.01
Terrestrial habitat	1	1	1	1
Macrophyte cover	0.9	1	0.75	0.7
HSI score	0.83	0.69	0.74	0.33
Pond suitability	Excellent	Average	Good	Poor

Table 3.2.4 Categorisation of HSI score

HSI score	Pond stability
< 0.50	Poor
0.50 – 0.59	Below average
0.60 – 0.69	Average
0.70 – 0.79	Good
> 0.80	Excellent

3.2.24 The majority of the land required to construct the Scheme comprises highly managed arable land and improved grassland, which is generally unsuitable for amphibians, although some grassland can offer low suitability for amphibians if left unmanaged and tussocky. The boundary hedgerows provide discrete areas of suitable terrestrial habitat for amphibians, and these are connected to other suitable terrestrial habitats such as the woodlands to the north and south of the land required to construct the Scheme and rough grassland to the west. Although there are no known records of great crested newt locally, there is potentially suitable breeding habitat for this species (and other common and widespread amphibians such as smooth newt, common toad and common frog).

3.2.25 A previous eDNA survey carried out in June 2023 on pond 7 returned negative results. This pond was scoped out in 2026 as it was dry. The remaining four ponds with potential suitability will require updated eDNA surveys (ponds 1, 2, 3 and 10) prior to works commencing.

3.2.26 Great crested newt were assessed as likely absent from the land required to construct the Scheme, and the Scheme was assessed as offering some opportunities to other common and widespread species of amphibians.

Reptiles

3.2.27 The desk study returned 15 records of grass snake (*Natrix helvetica*). The closest record was located approximately 83m north of the land required to construct the Scheme, within Whiston Meadows LWS.

3.2.28 The boundary hedgerows provide discrete areas of suitable shelter habitat for reptiles and these are connected to Whiston Meadows LWS, where grass snake is known to occur, and other suitable habitat such as the woodland along the M1 motorway embankment. However, the majority of the land required to construct the Scheme comprises highly managed arable land and improved grassland which is unsuitable for reptiles but may provide some opportunities. As such, no significant populations of reptiles are considered to be present within the land required to construct the Scheme, although small numbers could be present due to the known presence of reptiles in the adjacent Whiston Meadows LWS.

Birds

3.2.29 The desk study returned 4893 records of 64 protected and/or notable birds within 2km of the land required to construct the Scheme, some of which are listed in the amber/red lists of Birds of Conservation Concern (Stanbury et al., 2021), under

Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) or are Species of Principal Importance under Section 41 of the Natural Environment and Rural Communities Act 2006. A total of eight records came within the land required to construct the Scheme. These include peregrine (*Falco peregrinus*), skylark (*Alauda arvensis*), reed bunting (*Emberiza schoeniclus*), yellowhammer (*Emberiza citrinella*), and greylag goose (*Anser answer*).

- 3.2.30 No breeding bird surveys have been undertaken for the Scheme, however five breeding bird surveys were undertaken for the new 400kV Long Lane Substation. Birds are highly mobile, so the surveys may provide insight into the surrounding Scheme areas, however the below survey results are not directly representative of the Scheme bounds.
- 3.2.31 Full details regarding the results of the those breeding bird surveys and the Breeding Bird Survey Maps are recorded in Appendix J, Long Lane Breeding Bird Report of this EAR.
- 3.2.32 The hedgerows within the land required to construct the Scheme provide breeding habitat for shrub nesting birds such as dunnock (*Prunella modularis*) and song thrush (*Turdus philomelos*). The arable land and improved grassland are suitable for ground-nesting birds such as lapwing (*Vanellus vanellus*) and Eurasian skylark (*Alauda arvensis*).
- 3.2.33 The hedgerows and arable land within the land required to construct the Scheme, and adjacent woodlands to the north and south of the Scheme, also provide foraging opportunities for a range of birds, including wintering species such as Eurasian skylark and redwing.

Bats

- 3.2.34 The desk study returned 491 records of bats within 2km of the land required to construct the Scheme, including noctule bat (*Nyctalus noctula*), common pipistrelle (*Pipistrellus pipistrellus*), myotis bat (*Myotis* sp.) and brown long-eared bat (*Plecotus auritus*). Multiple records were inside the land required to construct the Scheme. The closest record of a roost was of a soprano pipistrelle (*Pipistrellus pygmaeus*) bat located approximately 658m north of the land required to construct the Scheme at Newman School.
- 3.2.35 The desk study identified three granted EPSM licence applications for common pipistrelle, the closest located approximately 610m south east of the land required to construct the Scheme. There is no SAC designated for bats within 10km of the land required to construct the Scheme.

Roosting Bats

- 3.2.36 Four trees with potential roost features (PRFs) and two areas with trees with further assessment required (FAR) were identified within 15m of the land required to construct the Scheme during surveys in 2023 and 2026.
- 3.2.37 Results in 2023 found four trees were recorded with potential roosting features, two of which were considered low suitability. Two areas recorded trees which had potential for roosting features but required further assessment.
- 3.2.38 The tree rating was updated with new methodology following updated surveys in June 2026. All trees identified within 15m of the Scheme were noted as PRF-I or FAR during the 2026 survey.

Commuting and Foraging Bats

- 3.2.39 No bat activity surveys have yet been undertaken specifically within the land required to construct the Scheme; however, commuting and foraging bat surveys were undertaken for the new 400kV Long Lane Substation. Bats are highly mobile, so the surveys are likely to provide insight into the surrounding land required to construct the Scheme.
- 3.2.40 Full details regarding the results of those bat surveys and the Bat Activity Survey Map are recorded in Bat PRF Tree Locations Map in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.2.5.
- 3.2.41 Three Night-time Bat Walkover surveys were undertaken following Bat Conservation Trust Good Practice Guidelines (Collins, 2023), to understand bat activity for the new 400kV Long Lane Substation. Common pipistrelle, soprano pipistrelle (*Pipistrellus pygmaeus*) and *Myotis* sp. activity recorded was fairly spread across the new 400kV Long Lane Substation site, with only one species, common pipistrelle, recorded foraging. These species could be foraging within the wider surrounding land required to construct the Scheme. Commuting activity was widely dispersed throughout the new 400kV Long Lane Substation survey area, with bats mainly found in areas where linear features were present, providing good connectivity between adjacent habitats. Such features included areas of the woodland edge and hedgerows. These same habitats found in the surrounding landscape are likely to support similar species of bats.

Badger

- 3.2.42 The desk study returned 27 records of badger (*Meles meles*) within 2km of the land required to construct the Scheme, the closest located approximately 120m east of the land required to construct the Scheme. Some records may have come closer to but the exact location is marked as confidential.
- 3.2.43 No evidence of badger activity was noted within the land required to construct the Scheme during the surveys. The hedgerows within land required to construct the Scheme, adjacent woodlands to the north and west, and the agricultural land within and surrounding the landscape are suitable for foraging and dispersal.

Otter and Water Vole

- 3.2.44 The desk study returned 11 records of otter (*Lutra lutra*) within 2km of the land required to construct the Scheme. The closest record was 12m west of the land required to construct the Scheme, along the River Rother. The desk study returned no records of water vole (*Arvicola amphibius*) within 2km of the land required to construct the Scheme.
- 3.2.45 There were multiple watercourses within land required to construct the Scheme with the potential to support both otter and water vole. There were potential water vole burrows noted in the north of the land required to construct the Scheme.
- 3.2.46 Several ditches were noted as being suitable for commuting water vole and otter.

Other Mammals

- 3.2.47 The desk study returned 12 records of hedgehog (*Erinaceus europaeus*) within 2km of the land required to construct the Scheme, the closest record approximately 19m east of the land required to construct the Scheme. Hedgehogs are commonly found

in woodland edges and hedgerows, similar to habitat present on and around the Scheme.

- 3.2.48 The desk study returned 37 records of Brown hare (*Lepus europaeus*). The closest two records were located within the land required to construct the Scheme. The arable fields, grassland and woodland edges present all provide suitable habitat for brown hare.
- 3.2.49 There were also four records of harvest mouse (*Micromys minutus*) within 2km of the land required to construct the Scheme, the closest record was located within the land required to construct the Scheme.

Baseline Summary

- 3.2.50 A summary of the receptors within the ZOI of the Scheme is included within Table 3.2.5. As it is not necessary to carry out detailed assessment of features that are sufficiently widespread, unthreatened and resilient to project impacts and will remain viable and sustainable (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018), where receptors have been assessed as being of less than Local importance, or where the Scheme is not considered to have any impacts upon the receptors, these have been scoped out of further assessment.
- 3.2.51 Despite being scoped out of further assessment, many of the receptors will benefit from the control measures detailed below.

Table 3.2.5 Summary of baseline receptors and scoping impacts in absence of mitigation

Receptor	Importance	Scoped in/out	Justification for scoping out
Designated Sites			
Whiston Meadows LWS	Local	In	N/A
Burnt Wood LWS	Local	In	N/A
Old Flatts Farm Marsh LWS	Local	In	N/A
Old Flatt's Farm Marsh (extension) cLWS	Local	In	N/A
Revel Wood LWS	Local	In	N/A
Canklow Wood LWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (20m north west of the land required to construct the Scheme) and lack of feasible impact pathways.
Ulley Country Park LWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (20m south east of the land required to construct the Scheme), road buffer (Pleasley Road) and lack of feasible impact pathways.

Receptor	Importance	Scoped in/out	Justification for scoping out
Treeton Colliery LWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (55m west of the land required to construct the Scheme) and lack of feasible impact pathways.
Treeton Wood LWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (364 south of the land required to construct the Scheme) and lack of feasible impact pathways
Treeton Biffa Tip (extension) cLWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (370m west of the land required to construct the Scheme) and lack of feasible impact pathways.
Treeton Dyke LWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (750m south west of the land required to construct the Scheme) and lack of feasible impact pathways
Waverly Lakes (b) Extension cLWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (1.6km south-west of the land required to construct the Scheme) and lack of feasible impact pathways
Waverly Lakes (b) cLWS	Local	Out	The qualifying features for designation will not be affected by the Scheme due to type, distance (1.7km south-west of the land required to construct the Scheme) and lack of feasible impact pathways
Habitats			
Scrub	Local	In	N/A
Grassland	Local	In	N/A
Arable	Local	In	N/A
Hedgerows	Local	In	N/A
Tall ruderal vegetation	Local	In	N/A
Semi-natural broadleaved woodland	Local	In	N/A
Scattered trees	Local	In	N/A
Rivers and Streams	Less than Local	In	N/A

Receptor	Importance	Scoped in/out	Justification for scoping out
Ditches	Local	In	N/A
Protected and Notable Species			
Plants	Local	Out	There were no records of protected/notable plant species within the land required to construct the Scheme. The potential for the Scheme to support protected or notable plants is considered to be negligible.
INNS	N/A	In	N/A
Invertebrates	Local	Out	The Scheme supports locally common and widespread habitats and therefore is considered unlikely to support notable and/or protected species or a significant assemblage of invertebrate species.
Fish	Less than local	In	N/A
Amphibians	Local	In	N/A
Reptiles	Local	In	N/A
Birds	Less than local	In	N/A
Roosting bats	Local	In	N/A
Commuting and foraging bats	Local	In	N/A
Badger	Local	In	N/A
Otter	Local	In	N/A
Water vole	Local	In	N/A
Other mammals	Local	In	N/A

Potential Construction Impacts

- 3.2.52 The works required will include installations of haul roads; laydown/working platforms around existing pylons and proposed pylon locations; conductor/earth wire pulling; installation of new permanent structures; dismantling of existing structures; installation of temporary structures; erection and use of scaffolding; and laydown areas. These may cause impacts on the following ecological features, described below.
- 3.2.53 Designated sites (Whiston Meadows LWS, Burnt Wood LWS, Revel Wood LWS, Old Flatts Farm Marsh LWS and Old Flatts Farm Marsh (extension) cLWS): Construction activities in or within the vicinity of these non-statutory designated sites could result in disturbance and degradation of habitats through vegetation removal, dust deposition from vehicle movements and earthworks, accidental spillages (e.g. fuels/oils) and silt-laden runoff entering adjacent vegetation, and indirect impacts where temporary

working areas are established close to site boundaries. Increased human activity could also temporarily disturb fauna associated with these sites.

- 3.2.54 Woodland (mixed woodland plantation; semi-natural broadleaved woodland; woodland broadleaved plantation): Works could require removal of trees/understorey vegetation, with associated loss of nesting/roosting opportunities and changes in woodland structure. Groundworks and trafficking close to retained trees could compact soils and damage rooting zones, while changes to drainage patterns from excavations could affect woodland ground flora.
- 3.2.55 Breeding/wintering birds: Laydown areas on arable field and the clearance of scrub, hedgerows and woodland edge could result in direct loss of nesting habitat and disturbance to breeding birds through physical impact, noise, vibration and visual presence. Construction lighting and increased activity could also affect foraging behaviour, while temporary loss of field margin habitat could reduce availability of seed and invertebrate prey for farmland birds.
- 3.2.56 Hedgerows: Hedgerow sections could be removed or trimmed back to facilitate access, laydown areas or conductor pulling, resulting in temporary habitat loss and fragmentation of linear features used for commuting/foraging by bats and dispersal by other wildlife. Construction dust and accidental contamination could reduce hedgerow foliage quality and invertebrate availability along retained lengths.
- 3.2.57 Grassland/tall ruderal vegetation: this could be affected by temporary or permanent habitat loss where vegetation is cleared or stripped to facilitate access, laydown areas or working corridors. Construction activity could also result in soil compaction, disturbance to the sward, and changes in local drainage, which may reduce habitat quality and affect the floristic composition of retained areas. Dust deposition and accidental contamination through run off could further degrade sensitive vegetation and associated invertebrate interest.
- 3.2.58 Scattered trees: Individual trees could be affected by direct felling/pruning where access is required, or indirectly through root damage, compaction and changes to surrounding ground levels. Lighting of working areas and night-time activity near retained trees could alter their value to bats and birds using the canopy edge.
- 3.2.59 Ditches: There are ditches within the land required to construct the Scheme. Although there are no anticipated direct impacts, these could be indirectly impacted if construction activities were to be undertaken in close proximity, for example through bank erosion, compaction, changes to surrounding ground levels and accidental contamination through pollution pathways.
- 3.2.60 Invasive Non-Native Species (INNS): Himalayan balsam was recorded within the land required to construct the Scheme. Works taking place adjacent to this recorded species require pre-commencement surveys and a precautionary working method statement for avoidance of any INNS spread. Where works cannot avoid areas with INNS, a detailed method statement will be produced for appropriate vegetation removal of INNS.
- 3.2.61 Reptiles: Vegetation clearance, soil stripping and creation of working platforms could result in direct injury or mortality of reptiles using field margins, scrub and refugia (e.g. debris/concrete slabs). Disturbance from plant, vibration and repeated vehicle movements could displace individuals into less suitable habitat and increase road mortality risk along haul routes.

- 3.2.62 Fish: Ground disturbance, vegetation clearance, soil stripping and construction activities could lead to direct or indirect harm to fish using the River Rother. Works near the watercourse could also temporarily reduce habitat suitability through siltation, runoff, lighting and disturbance.
- 3.2.63 Common amphibians: Ground disturbance and trenching could lead to direct harm to amphibians using margins, ditches and rough grass/scrub for shelter. Works near ditches could also temporarily reduce habitat suitability through siltation and disturbance, and amphibians could be at increased risk of mortality from open excavations or vehicle movements, particularly during seasonal movements.
- 3.2.64 Roosting bats: Works that require removal, pruning or disturbance of trees could affect PRFs such as cracks, cavities, rot holes, lifted bark and/or ivy cover. Where such features are present, construction activity could result in temporary disturbance to roosting bats (e.g. from vibration and noise during felling/pruning or works in close proximity), or permanent loss of roosting opportunities if PRF trees are removed.
- 3.2.65 Commuting and foraging bats: Bats may use linear features (e.g. hedgerows, woodland edge, tree lines and scrub) within and adjacent to the land required to construct the Scheme as commuting and foraging routes. Construction could result in temporary severance or temporary degradation of these linear features through vegetation removal, creation of access/haul routes and working areas, and increased activity at potential crossing points. Artificial lighting associated with night-time working (if required) or security lighting could affect bat activity and movement behaviour, particularly for light-sensitive species, and may reduce use of otherwise suitable routes. Increased vehicle movements along access tracks/haul routes could also increase collision risk where bats cross at low height or concentrate activity along connecting features.
- 3.2.66 Badger: Groundworks and vegetation clearance could disturb badgers using the land required to construct the Scheme for foraging and commuting and could risk damage to setts if works occur close to sett locations. Increased traffic and night-time activity could alter movement patterns and increase collision risk, particularly where haul routes intersect established badger paths. Excavations left open could entrap badgers.
- 3.2.67 Otter and water vole: Works which affect a watercourse or come within 10m of a riverbank or suitable ditch could disturb otter and water vole, including damaging their resting places. Works near ditches could also temporarily reduce habitat suitability through siltation and disturbance, and amphibians could be at increased risk of mortality from open excavations or vehicle movements, particularly during seasonal movements.
- 3.2.68 European hedgehog: Vegetation clearance, strimming and movement of materials could result in direct injury to hedgehogs sheltering in scrub/hedgerows. Temporary fencing, open trenches and increased vehicle movements could impede movements and increase mortality risk within working areas and along access tracks.
- 3.2.69 Brown hare: Construction activity within arable fields could temporarily displace hares from foraging and resting areas through increased noise, visual disturbance and vehicle movements. Groundworks and temporary working areas could reduce available cover in field margins, and traffic movements could increase collision risk.

Potential Operational Impacts

- 3.2.70 Woodland (mixed woodland plantation; semi-natural broadleaved woodland; woodland broadleaved plantation): Operational requirements for safe asset management could result in ongoing vegetation management and retained access routes around the pylons and overhead lines, which could affect woodland structure and understorey composition.
- 3.2.71 Hedgerows: Occasional vehicle movements or vegetation clearance during maintenance visits could intermittently increase disturbance to species using the hedgerows.
- 3.2.72 Scattered trees: Trees retained adjacent to overhead lines or pylons could be subject to ongoing pruning or clearance to maintain statutory safety clearances and operational access, resulting in a reduction in canopy extent and potential roost/nesting opportunities.
- 3.2.73 Breeding/wintering birds: There will be minimal negative impacts on breeding/wintering birds due to the limited footprint of pylons. The presence of pylons could also increase potential nesting sites for corvids and other birds that may favour pylons.
- 3.2.74 Roosting bats: Where trees with PRFs are retained near pylons or overhead lines, intermittent maintenance (including vegetation management for safety clearances) could affect PRFs through pruning or altered tree condition over time.

Construction Control Measures

- 3.2.75 The control measures listed in Table 3.2.6 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP and their implementation will be monitored by National Grid.

Table 3.2.6 Construction control and monitoring measures for Ecology

Potential receptor and/or impact	Control and monitoring measures
Designated Sites	
Whiston Meadows LWS	<p>Vegetation clearance works undertaken within the LWS must be done under Ecological Clerk of Works (ECoW) supervision.</p> <p>Brief all staff at site induction.</p> <p>Implement dust controls on haul routes and during earthworks (e.g. damping down; cover stockpiles where required).</p> <p>Spill prevention/response procedures for fuels and oils; refuelling in designated areas only.</p> <p>Routine environmental inspections; record and report any incidents/near misses.</p> <p>Notify local authority of works taking place.</p> <p>All habitats removed or impacted by the works will be reinstated in the same condition or better.</p>
<p>Burnt Wood LWS</p> <p>Revel Wood LWS</p> <p>Old Flatts Farm Marsh LWS</p> <p>Old Flatt's Farm Marsh (extension) cLWS</p>	<p>Brief all staff at site induction.</p> <p>Implement dust controls on haul routes and during earthworks (e.g. damping down; cover stockpiles where required).</p> <p>Spill prevention/response procedures for fuels and oils; refuelling in designated areas only.</p> <p>Routine environmental inspections; record and report any incidents/near misses.</p> <p>Notify local authority and relevant stakeholders of works taking place.</p> <p>All habitats removed or impacted by the works will be reinstated in the same condition or better.</p>
Habitats	
Woodland	<p>Mark retained woodland edge and tree root protection areas; prohibit tracking/storage within protection zones.</p> <p>Limit vegetation clearance to the minimum required footprint; avoid encroachment beyond agreed working areas.</p> <p>Toolbox talks for working near trees/woodland; ecological support during site set-up as required.</p> <p>Ensure works take place in accordance with BS 5837:2012 (British Standards Institution, 2012).</p>
Grassland	<p>Restrict access, storage and vehicle movements to approved working areas and routes; avoid unnecessary encroachment.</p> <p>Confirm the extent of any temporary or permanent habitat loss prior to works; minimise working widths wherever practicable.</p>
Hedgerows	<p>Fence/mark retained hedgerows; restrict crossings to approved locations.</p>

Potential receptor and/or impact	Control and monitoring measures
Scattered trees	<p>Confirm extent of any hedgerow removal/trimming prior to works; maintain minimum working widths.</p> <p>Nesting bird check of vegetation scheduled for clearance during nesting season; record outcomes.</p> <p>Tree protection fencing and exclusion of plant/stockpiles from root protection areas.</p> <p>Confirm constraints (e.g. nesting birds/bat roost potential) prior to felling/pruning.</p> <p>If night working is required, manage lighting to minimise light spill onto tree lines/edges.</p> <p>All works to take place in compliance with BS 5837:2012.</p>
Rivers, streams and Ditches	<p>Maintain buffer to ditch edges; restrict crossings/culvert works to agreed locations and methods.</p> <p>Install and maintain silt controls where earthworks/drainage works are adjacent to ditches.</p> <p>Inspect drainage and silt controls regularly, including after heavy rainfall; record findings.</p>
Invasive and Non-native species	<p>Himalayan Balsam</p> <p>Works taking place near this recorded species require pre-commencement surveys and a precautionary working method statement for avoidance of any INNS spread. Where works cannot avoid areas with INNS, a detailed method statement will be produced for appropriate vegetation removal of INNS.</p>
Protected and Notable Species	
Reptiles	<p>Undertake pre-work checks of refugia (e.g. debris/concrete slabs) within working areas by a qualified ECoW prior to works starting.</p> <p>Vegetation should be cut in a phased approach to 30cm above ground-level using hand held tools (e.g. chainsaws) and the arisings should be checked again before being stacked or removed. A further cut to ground level will follow 24-48 hours later.</p> <p>During reptile brumation season (October-March inclusive) there should be no removal of potential refugia/hibernacula.</p> <p>Brief site teams on stop-work procedure if reptiles are encountered; record sightings.</p>
Fish	<p>Watercourse protection fencing and exclusion of plant/stockpiles from 10m bankside protection zone.</p> <p>Standard pollution protection measures, for the management of risk of runoff, dust and spills</p>
Common amphibians	<p>Check open excavations regularly where practicable; provide egress (e.g. ramps/graded ends) for trenches left open.</p> <p>Store materials to minimise creation of refugia within active working areas.</p>

Potential receptor and/or impact	Control and monitoring measures
	<p>Vegetation should be cut in a phased approach to 30cm above ground-level using hand held tools (e.g. chainsaws) and the arisings should be checked again before being stacked or removed. A further cut to ground level will follow 24-48 hours later. Record amphibian encounters and any ecological attendance required.</p>
Breeding/wintering birds	<p>Nesting bird checks by a suitably qualified ECoW of construction areas, vegetation scheduled for clearance and pylons to be climbed during nesting season; record outcomes. Should any active nests be found on pylons or in construction areas, consult further ecological advice.</p> <p>Manage night-time lighting to minimise spill onto hedgerows/woodland edge where practicable.</p> <p>Site induction/toolbox talks on legal protection and reporting procedure.</p>
Roosting bats	<p>Confirm PRF status and any survey/constraint requirements prior to felling/pruning of trees with bat roost potential.</p> <p>Maintain exclusion zones around retained PRF trees where works could cause disturbance.</p> <p>Record tree works undertaken and any bat-related observations/incidents.</p> <p>Restrict any lighting away from known PRFs to minimise disturbance to bats.</p>
Commuting and foraging bats	<p>Locate compounds/haul routes to minimise severance of linear features where practicable; limit vegetation removal to minimum needed.</p> <p>Apply a lighting management approach for night works (directional, low-spill lighting) to reduce illumination of hedgerows/woodland edges.</p> <p>Undertake checks of lighting placement/operation during periods of night working; record any issues.</p>
Badger	<p>Badger sett closures and artificial sett creation may be required prior to works commencing on active badger setts. A licence is required for these works.</p> <p>Pre-works walkover for badger setts/field signs within/adjacent to working areas and within 30m buffer of works; record findings.</p> <p>Ensure any active setts are adequately protected from works by an appropriate buffer as defined by ECoW. Should any active setts be impacted by works, a Natural England licence may be required.</p> <p>Implement site speed limits and driver briefings to reduce collision risk, particularly at night.</p> <p>Record sightings and any new setts/signs identified during works.</p>

Potential receptor and/or impact	Control and monitoring measures
Otter	<p>Pre-works walkover for otter field signs for works being carried within 10m of a riverbank or suitable ditch. Otter resting places identified within the working area will require a licence.</p> <p>Record sightings and any new signs identified during works.</p>
Water vole	<p>Pre-works walkover for water vole field signs for works being carried within 10m of a riverbank or suitable ditch. Water vole resting places identified within the working area will require a licence.</p> <p>Standard pollution protection measures, for the management of risk of runoff, dust and spills</p> <p>Site induction/toolbox talks on legal protection; record sightings.</p> <p>Record sightings and any new signs identified during works.</p>
European hedgehog Brown hare	<p>Manage vehicle speeds on access/haul routes and brief drivers on wildlife collision risk.</p> <p>Minimise the extent/duration of open working areas in arable fields where practicable.</p> <p>Sensitive clearance of scrub/rough grass where present; check beneath materials prior to moving where practicable.</p> <p>Check open excavations and pipes/culverts prior to backfilling; provide escape where trenches are left open.</p> <p>Site inductions to include hedgehog awareness and reporting procedures.</p> <p>Record incidents and sightings to inform adaptive site management if repeated issues occur.</p>

Operational Control Measures

- 3.2.76 The measures listed in Table 3.2.7 will be implemented during the operational phase of the Scheme and the appraisal has been undertaken assuming these measures are in place.

Table 3.2.7 Operational control and monitoring measures for Ecology

Potential receptor and/or impact	Control, enhancement and monitoring measures
Designated Sites	<p>Operational incident response procedures for spills/leaks; record and investigate any incidents affecting the receiving environment. Undertake periodic site environmental inspections (e.g. housekeeping, evidence of off-site effects such as sediment, litter or lighting spill).</p> <p>Regular environmental monitoring of reinstated habitats where required.</p>
Habitats	
Woodland (mixed woodland plantation; semi-natural broadleaved woodland; woodland broadleaved plantation)	<p>Ensure woodland management underneath the overhead line is maintained within defined limits (avoid incremental loss from repeated cutting/back-trimming).</p> <p>Avoid storage/parking within tree root protection areas where practicable; maintain ground protection where access is required. Schedule routine vegetation management to minimise disturbance where practicable; record vegetation management activities. Inspect retained trees adjacent to operational infrastructure for condition and safety and record any required arboricultural works.</p>
Hedgerows	<p>Ensure hedgerow management underneath the overhead line is maintained within defined limits (avoid incremental loss from repeated cutting/back-trimming).</p>
Scattered trees	<p>Avoid storage/parking within tree rooting areas where practicable; maintain ground protection where access is required. Routine inspection of trees near operational infrastructure for safety defects; record outcomes and actions.</p>
Grassland/tall ruderal vegetation	<p>Restrict access, storage and vehicle movements to approved working areas and routes; avoid unnecessary encroachment. Confirm the extent of any temporary or permanent habitat loss prior to works; minimise working widths wherever practicable.</p>
Protected and notable species	<p>Prior to any proposed overhead line maintenance works including any vegetation clearance, a pre-works ecological assessment should be undertaken in order to assess if the works could potentially impact protected and/or notable species.</p> <p>Any proposed vegetation management underneath the overhead line should ideally be undertaken outside of the nesting bird season (March to August inclusive) unless an appropriately qualified ecologist confirms active nests to be absent.</p>

3.3 Landscape and Visual

Introduction

- 3.3.1 This section details the Landscape and Visual baseline conditions and the environmental appraisal of the potential Landscape and Visual impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.3.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; Appendix D, Long Lane New Overhead Lines Drawings; and Appendix E, Long Lane New Overhead Lines Type 1 Photographic Survey.

Study area

- 3.3.3 The study area for the Landscape and Visual appraisal, as shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.3.1, comprises the land required to construct the Scheme plus a 2km buffer on all sides.

Consultation

- 3.3.4 No further consultation specific to Landscape and Visual and the Scheme has been undertaken.

Baseline

Landscape designations

- 3.3.5 There are no landscape-related designated sites (National Landscapes or National Parks) within the study area. However, the scheduled monument 'Blue Man's Bower moated site, Whiston' falls partially within the land required to construct the Scheme (see Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.3.2). There are several Grade I and II listed buildings and a conservation area within Whiston to the north east.
- 3.3.6 Much of the study area lies within Green Belt land, as defined by RMBC (see Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.3.2).

Published landscape character

National landscape character

- 3.3.7 The study area lies within National Character Area (NCA) 38: Nottinghamshire, Derbyshire and Yorkshire Coalfield. The study area and its environs are therefore likely to exhibit characteristics of this NCA.
- 3.3.8 The key characteristics of NCA 38 (Natural England, 2013) include:
- *'A low-lying landscape of rolling ridges with rounded sandstone escarpments and large rivers running through broad valleys, underlain by Pennine Coal Measures.*
 - *Local variations in landscape character reflecting variations in underlying geology.*

- *Several major rivers flow through the rural and urban areas of the NCA, generally from west to east in broad valleys.*
- *A mixed pattern of built-up areas, industrial land, pockets of dereliction and farmed open country.*
- *Small, fragmented remnants of pre-industrial landscapes and more recent creation of semi-natural vegetation, including woodlands, river valley habitats and subsidence flashes, with field boundaries of clipped hedges or fences.*
- *Many areas affected by urban fringe pressures creating fragmented landscapes, some with a dilapidated character, separated by substantial stretches of intact agricultural land in both arable and pastoral use.*
- *A strong cultural identity arising from a history of coal mining, steel making and other heavy industry which resulted from the close relationship between underlying geology and resource availability, notably water power, iron ore and coal.*
- *Features of industrial heritage such as mills, goits, tips, old railway lines, canals and bridges are evident, along with former mining villages.*
- *Many large country houses and estates established by wealthy industrialists in the 18th and 19th centuries and ancient monuments create focal points and important recreational opportunities within the landscape, such as Bretton Hall, Wentworth, Woodhouse, Temple Newsam, Nostell Priory, Bolsover Castle and the ruins of Codnor Castle.*
- *Extensive urbanisation, such as in the major cities of Leeds and Sheffield, with terraced and back-to-back housing and grand 19th-century municipal buildings and churches at their centres, now surrounded by extensive housing and industrial development.*
- *Widespread influence of transport routes, including canals, roads and railways, with ribbon developments emphasising the urban influence in the landscape.*
- *An extensive network of multi-user trails on former railway lines and canal towpaths, such as the Trans Pennine Trail and the Ebor Way.*
- *Continuing development pressure including land renewal and regeneration projects, especially along river corridors and around towns.'*

Regional Landscape Character

3.3.9 The Rotherham Landscape Character Assessment and Landscape Capacity Study, 2010 (Rotherham Borough Council, 2010) places the land required to construct the Scheme and study area within the following Landscape Character Areas (LCAs) (see Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.3.3):

- LCA 5B – Coalfield Tributary Valleys – Treeton;
- LCA 6 – Rother Valley Floor; and
- LCA 8 – Central Rotherham Coalfield Farmland.

3.3.10 The key characteristics of LCA 5C are:

- *'Predominantly treed arable farmland with fragmented woodland blocks;*

- *Undulating landform with narrow valleys to the north and wide valleys to the south;*
- *Large reservoirs found within the valleys;*
- *Settlement on surrounding higher ground very visually prominent;*
- *Settlement often built of local Rotherham Red stone; and*
- *Proximity to urban areas'*

3.3.11 The key characteristics of LCA 6 are:

- *'Broad, flat valley floor and floodplain;*
- *Meandering course of River Rother, canalised in places to allow for mining operations;*
- *Heavily influenced by opencast mining, most of which has been or is in the process of being restored;*
- *Immature woodland planting;*
- *Major recreation and wildlife corridor; and*
- *Bisected by the M1 motorway'*

3.3.12 The key characteristics of LCA 8 are:

- *'Gently undulating landform;*
- *Large scale arable landscape, with smaller fields around settlements;*
- *Limited woodland cover, although there are woodland blocks at Wickersley Wood and Listerdale Wood;*
- *Most settlement based on mining villages (apart from Todwick which is a dormitory village) with red brick buildings;*
- *Several former deep mines, most now reclaimed, including Thurcroft, Dinnington, Kiveton Pit and Silverwood;*
- *Motorway corridors generally in cutting and not a prominent feature (except in extreme south) – junction of M1 and M18 is prominent;*
- *Stone quarries present around Wickersley; and*
- *Panoramic wide-angled views to the south west horizon towards Sheffield'*

3.3.13 Whilst much of the wider landscape within these LCAs is rural in nature, they contain noticeable existing electrical transmission infrastructure, which coupled with the proximity to urban settlements to the north, and the presence of the M1 corridor, form notable detractors that contribute to a considerable reduction in the overall sensitivity of these receptors. It is therefore considered that these LCAs have a medium/low sensitivity to development of this nature.

Local landscape character

3.3.14 At the local level, the physical landscape comprises a mixture of undulating irregular agricultural fields bounded by mature hedgerows. Electrical transmission

infrastructure is a very noticeable characteristic, as is the M1 corridor and the River Rother, which pass through the land required to construct the Scheme.

- 3.3.15 The landscape is considered to be of **low** sensitivity to development of this nature.
- 3.3.16 The sensitivity of landscape receptors has been determined using professional judgement, by combining the perceived value of the receptor and the susceptibility of the receptor to change arising from the Scheme, in accordance with the methodology set out in Appendix B, Methodology of this EAR.

Visual amenity baseline

- 3.3.17 The Scheme is located within a predominantly rural setting, straddling the M1 corridor which runs east west through the study area. Existing vegetation within the study area predominantly comprises agricultural fields, bounded by hedgerows, however there are a number of sizeable areas of woodland including Canklow Woods, Treeton Wood, Hail Mary Hill Wood, Burnt Wood, Revel Wood and Bole Hill Plantation.
- 3.3.18 The Scheme is partially bound to the north by established broadleaf woodland at Whiston Meadows, which partially obscures southerly views of the Scheme from residential development at Whiston beyond. Established woodland along the M1 highway embankment partially screens views of the more northerly aspects of the Scheme from receptors to the south.
- 3.3.19 The wider setting to the north and west of the Scheme is quite developed and urban in nature, characterised by residential and industrial development at Brinsworth, and Rotherham, whilst the area to the east and beyond the M1 to the south, is distinctly more rural in nature, with smaller settlements at Treeton, Aughton and Ulley located further from the land required to construct the Scheme towards the edge of the study area.
- 3.3.20 There are a number of water bodies within the study area, including the River Rother, Whiston Brook, Ulley Brook, Ulley Reservoir (within Ulley Country Park) and Treeton Dyke.
- 3.3.21 A classification of the sensitivity of visual receptors within the study area is provided in Table 3.3.1. This sensitivity has been determined using professional judgement, by combining the perceived value that receptors attach to the existing view and the susceptibility of the receptor to change arising from the Scheme, in accordance with the methodology set out in Appendix B, Methodology.
- 3.3.22 The locations of Representative Viewpoints (RVs), from which viewpoint photography has been taken during field work, are shown in Appendix D, Long Lane New Overhead Line Drawings, Figure 3.3.5.
- 3.3.23 A description of the current amenity of the visual receptors at each of these RVs is provided in Table 3.3.1 below. A suite of RV photography is presented in Appendix E, Long Lane New Overhead Lines Type 1 Photographic Survey.

Table 3.3.1 Visual receptors at each RV

RV No/receptor details	Direction and distance from the land required to construct the Scheme	Sensitivity of visual receptors represented by this RV
RV01: Users of the A618 and Guilthwaite Common Lane	350m to the east Looking north-west	Medium
RV02: Users of Whiston Footpath no. 13, residents of Guilthwaite and users of the A618	Adjacent to the east Looking north-west	Medium
RV03: Users of Whiston Footpath no.12 and the A618/Pleasley Road	75m to the north-east Looking south-west	Medium
RV04: Users of Long Lane, the A631 and residents along the Rotherham urban fringe to the north	275m to the north Looking south	Medium
RV05: Users of Whiston Footpath no. 7 near Ulley Brook	Within the land required to construct the Scheme Looking east	Medium
RV06: Users of Treeton Footpath no.1 near Ulley Brook	Within the land required to construct the Scheme Looking east	Medium
RV07: Users of Treeton Footpath no.1 near Ulley Brook	Within the land required to construct the Scheme Looking east	Medium
RV08: Users of bridge over River Rother along Haworth Lane	Within the land required to construct the Scheme Looking east	Medium
RV09: Residents of Spa Farm/Houses and users of Treeton Footpath no.4	100m to the west Looking north	Medium
RV10: Users of Pinch Mill Lane	1.5km to the north-east Looking south-west	Medium

Potential Construction Impacts

Landscape appraisal

- 3.3.24 The construction of the Scheme infrastructure will introduce temporary incongruent elements to the existing landscape setting to varying degrees at different stages throughout the construction of the Scheme.

Landscape character

National landscape character (NCA 38)

- 3.3.25 Given the relatively small scale of the Scheme in relation to the scale of the NCA, it is not anticipated that there will be any effects that are likely to materially alter the character of the wider NCA. Finer grained assessments at regional or local scale are more suitable for establishing effects upon landscape character. These are considered below.

LCA 5B – Coalfield Tributary Valleys – Treeton (medium/low sensitivity)

- 3.3.26 Part of the land required to construct the Scheme is located within this LCA.
- The wider character area to the south and east is largely rural in nature, however the proximity to the urban fringe of Rotherham to the north, as well as the presence of the M1 corridor running through the land required to construct the Scheme, introduce notable urbanising factors. There is also a noticeable presence of existing electrical transmission infrastructure. The LCA is considered to have a **medium/low** sensitivity to development of this nature.
 - Construction phase: Physical effects upon notable landscape features such as pasture, arable fields, field boundary hedgerows and woodland will be limited during the construction phase, as the aspects of the Scheme located within this LCA are limited to access routes and temporary construction areas, as well as the relatively localised working areas around the small number of proposed temporary/permanent structures and existing structures to be removed.
 - There are likely to be limited effects upon the character of the landscape arising from construction phase activity, including the presence of large-scale construction machinery, with associated noise, dust and a reduction in tranquillity, which will affect a small part of the overall LCA (albeit temporarily). This will cause a **low** magnitude of change resulting in a **minor to negligible adverse** level of effect.

LCA 6 – Rother Valley Floor (medium/low sensitivity)

- 3.3.27 The bulk of the land required to construct the Scheme is located within this LCA.
- The LCA already accommodates noticeable existing electrical transmission infrastructure, most notably the existing overhead line routes that connect the existing Brinsworth Substation to the west, with the wider electricity network. The proximity to urban settlements to the north, west and south, as well as the presence of the M1 corridor running east–west and the railway line running north–south through the land required to construct the Scheme, introduces significant urbanising factors, such that the wider LCA is considered to have a **medium/low** sensitivity to development of this nature.
 - Construction phase: During the construction phase, physical effects upon notable landscape features such as pasture, arable fields, field boundary hedgerows and woodland will be limited, as much of the Scheme within this LCA involves temporary construction areas and access routes, as well as relatively localised working areas around proposed temporary/permanent structures and existing structures to be removed.

- There are likely to be noticeable effects upon the character of the landscape arising from construction phase activity, including the presence of large-scale construction machinery, with associated noise and dust coupled with some reduction in tranquillity, which will affect much of the northern extents of the LCA (albeit temporarily). This will cause a **medium** magnitude of change resulting in a **moderate to minor adverse** level of effect.

LCA 8 – Central Rotherham Coalfield Farmland

- 3.3.28 Given that the land required to construct the Scheme does not fall within this LCA there will be no direct effects upon the physical landscape. Limited intervisibility between neighbouring LCAs is such that it is considered that there would be no noticeable effects upon the character of this LCA.

Local Landscape Character (low sensitivity)

- 3.3.29 At the local (land required to construct the Scheme) scale the landscape is predominantly rural, encompassing a mixture of agricultural fields bounded by mature hedgerows and sections of the M1 corridor.
- The character of the landscape locally is heavily influenced by the presence of existing electrical transmission infrastructure and the M1 motorway. Landscape sensitivity at the local scale is therefore considered to be **low** to development of this nature.
 - Construction phase: Construction phase activity is likely to contribute to a considerable increase in the presence of noise, dust and other incongruent features in an otherwise relatively tranquil setting, leading to a **high** magnitude of change which will result in a **moderate to minor adverse** level of effect, albeit temporary.

Visual Amenity Appraisal

- 3.3.30 People notice movement and active change more than they notice fixed objects. The changing nature of the Scheme as it is being built and the presence of construction areas and large on-site machinery, often with hazard lights, will be highly noticeable. Also, the general noise and activity associated with construction sites may attract attention and cause viewers to notice and observe more than they will otherwise. These effects, however, will be temporary and short-term in nature.
- 3.3.31 These impacts will be reduced with the implementation of the proposed considerate construction practices (such as appropriately sited construction areas, suitable control of construction lighting, limiting material stockpile heights and implementing tree protection measures).
- 3.3.32 These construction phase effects will cease once the Scheme becomes operational.

Residential receptors (medium sensitivity)

- 3.3.33 There are a number of residential receptors within the study area. However, views towards the Scheme from many of these properties are likely to be screened (to varying degrees) by existing hedgerows and blocks of woodland and by vegetation along the embankments of the M1 corridor and to the north of the Scheme. For those residential receptors that are likely to experience views, sensitivity is considered to be **medium**, as there are notable visual detractors within existing views.

- 3.3.34 For the purposes of the appraisal, receptors that are likely to experience views are either considered individually or grouped together where effects are likely to be of a similar magnitude:
- Residential receptors off the A618 to the south of the M1 including Guilthwaite Nurseries, Guilthwaite Cottage, High Winds, The Barn House and Guilthwaite Grange to the east, represented by RV02.
 - The local topography is notably undulating, with the adjacent field sloping steadily downwards from north east to south west towards the Scheme and the M1 corridor to the north.
 - Construction phase: Construction phase activity is likely to be highly noticeable due to the location of a construction access to the south of Guilthwaite Nurseries and limited intervening vegetation to screen views of the Scheme and construction areas to the west. It is anticipated that there will be a **high** magnitude of change, which will result in a **major to moderate adverse** level of effect, albeit temporary in nature.
 - Residential properties within the Spa Farm estate, including Spa Farm, Spa House and two cottages, approximately 250m to the west, represented by RV09.
 - These properties are located on higher ground, with an elevated and largely unobstructed vantage point that permits panoramic views towards the Scheme.
 - Construction phase: Construction phase activity will be highly noticeable due to the location of a construction access which passes through the Spa Farm estate, coupled with the elevated vantage point, close proximity and limited intervening vegetation. It is anticipated that there will be a **high** magnitude of change, resulting in a **major to moderate adverse** level of effect, albeit temporary in nature.
 - Residential properties along the urban fringe of Whiston, located to the north/north east of the Scheme, and represented by RV04.
 - Foreground views from these receptors are likely to be limited or partially obscured by existing woodland to the north of Whiston Brook, however because they are located on higher ground, those properties with an open southerly aspect are likely to experience more distant views of the wider Scheme to the south of the M1 corridor.
 - Construction phase: Construction phase activity is likely be visible in longer views over intervening vegetation. It is anticipated that there will be a **medium** magnitude of change, resulting in a **moderate adverse** level of effect, albeit temporary in nature.

Recreational and access receptors (medium sensitivity)

- 3.3.35 There are a number of Public Rights of Way (PRoWs) within the study area that are likely to experience views of the Scheme to varying degrees, all of which are considered to be of **medium** sensitivity. For the purposes of the appraisal, these are grouped together in accordance with the degree to which they are likely to be affected:
- Whiston Footpath no.10 (RV05) runs broadly north west–south east through fields to the north of the M1 corridor is shown in Appendix D, Long Lane New Overhead Line Drawings, Figure 3.3.4. Proximity to the Scheme is such that views will be

unavoidable, and construction phase activity associated with the Scheme will form a noticeable discordant feature within views.

- Construction phase: The scale and extent of construction activity, coupled with close proximity and limited intervening vegetation to screen views, will cause a **medium** magnitude of change, resulting in a **major to moderate adverse** level of effect, albeit temporary in nature.
- Whiston Footpath no.12 (RV03) runs north eastwards between Long Lane to the south of the M1, passing through the land required to construct the Scheme, before passing under the M1 then crossing Pleasley Road and terminating at The Green in Whiston. This Footpath is shown in Appendix D, Long Lane New Overhead Line Drawings, Figure 3.3.4.
- Proximity to the Scheme is such that views will be unavoidable, and construction phase activity will form a highly noticeable discordant feature, altering the overall balance and composition of views for much of the route, particularly to the south of the M1.
 - Construction phase: The scale of construction activity, coupled with close proximity and limited intervening vegetation to screen views, will lead to a **high** magnitude of change, resulting in a **major to moderate adverse** level of effect, albeit temporary in nature.
- Treeton Footpath no.1 (RV06 and RV07) and Whiston Footpath no.7 (RV05) are located partially within a construction access route and partially within the land required to construct the Scheme. This two Footpaths are shown in Appendix D, Long Lane New Overhead Line Drawings, Figure 3.3.4.
- These PRoWs have 360-degree views of the Scheme, and whilst existing field boundary vegetation and the M1 corridor will offer some screening, construction phase activity will still form a highly noticeable incongruent feature within views from these receptors.
 - Construction phase: The scale of construction activity coupled with close proximity and limited intervening vegetation, will lead to a **high** magnitude of change, resulting in a **major to moderate adverse** level of effect, albeit temporary in nature.
- Treeton Footpath no.4 (RV09) and Whiston Footpath no.14 (RV01) and Whiston Footpath no.13 (RV02) are located partially within the land required to construct the Scheme, with largely unobstructed, elevated (in places) views. This two Footpaths are shown in Appendix D, Long Lane New Overhead Line Drawings, Figure 3.3.4.
 - Construction phase: The scale of construction activity coupled with close proximity (in places) and limited intervening vegetation, will lead to a **high** magnitude of change, resulting in a **major to moderate adverse** level of effect, albeit temporary in nature.

3.3.36 Whilst there are a number of additional PRoWs that are likely to experience views of the Scheme, these views are likely to be sufficiently distant and/or obscured by existing intervening vegetation such that effects will be no greater than **moderate to minor adverse** level of effect during the construction phase.

3.3.37 There is a network of highways within the wider study area; those that are likely to experience views of the Scheme are considered to be of **low** sensitivity:

- Long Lane and the M1 are located partially within the land required to construct the Scheme, crossing the route in two locations and in the case of Long Lane, connecting with several construction accesses.
 - Construction phase: Views are likely to be unavoidable for users of these routes due to the scale and extent of the Scheme and close proximity to construction areas, however they will be partially obscured by roadside vegetation and generally viewed oblique to the direction of travel. It is anticipated that this will lead to a **medium** magnitude of change, which will result in a **minor** level of effect, albeit temporary in nature.
- The A630 Rotherway and Haworth Lane (RV08) are located towards the west of the land required to construct the Scheme, passing through it in two locations.
 - Construction phase: Glimpsed oblique views of construction phase activity are likely for users of these routes, albeit filtered considerably by existing intervening vegetation. It is anticipated that this will lead to a **low** magnitude of change, which will result in a **minor to negligible adverse** level of effect.
- Pleasley Road (RV01, RV02 and RV03) is located predominantly on higher ground to the east of the land required to construct the Scheme, passing through it to the north of the M1 and connecting with two construction access points.
 - Construction phase: Whilst much of the route is lined by roadside vegetation, intermittent oblique views of construction phase activity are likely, albeit filtered considerably by existing intervening vegetation. It is anticipated that this will lead to a **low** magnitude of change, which will result in a **minor to negligible adverse** level of effect.

Potential Operational Impacts

Landscape appraisal

- 3.3.38 The land required to construct the Scheme will introduce incongruent elements to the existing landscape setting during the operational phase of the Scheme. It will also remove a number of existing elements including overhead line routes and pylons.
- 3.3.39 The appraisal therefore considers likely landscape effects at Year 1 of the operational phase and at Year 15, once proposed reinstatement or replacement of vegetation following construction has established (residual effects).

National landscape character NCA 38

- 3.3.40 Given the relatively small scale of the Scheme in relation to the scale of the NCA, it is not anticipated that there will be any effects that are likely to materially alter the character of the wider NCA.

LCA 5B – Coalfield Tributary Valleys – Treeton (medium/low sensitivity)

- 3.3.41 Part of the land required to construct the Scheme is located within this LCA.
- 3.3.42 Once the Scheme becomes operational, and construction areas, access routes and temporary overhead line diversions have been removed/reinstated, physical effects upon locally characteristic landscape features such as pasture, arable fields, field boundary hedgerows and woodland will be largely eliminated within this LCA.

- 3.3.43 The Scheme will introduce an additional overhead line route and pylon into the western extents of the LCA, however this will not be incongruent given the presence of existing transmission infrastructure in this area and within the adjacent LCA to the west.
- 3.3.44 Years 1 and 15: There are likely to be very limited effects upon the character of the landscape within this LCA once the Scheme becomes operational. This will lead to a **negligible** magnitude of change resulting in a **negligible adverse** level of effect.

LCA 6 – Rother Valley Floor (medium/low sensitivity)

- 3.3.45 The bulk of the land required to construct the Scheme is located within this LCA.
- 3.3.46 Once the Scheme becomes operational, temporary overhead line diversions will be removed and construction areas, access routes and temporary overhead line diversions have been removed/reinstated. There will be a noticeable reduction in the amount of existing electrical transmission infrastructure, most notably the existing overhead line routes (and associated pylons) that connect the existing Brinsworth Substation to the west, with the wider electricity network.
- 3.3.47 Years 1 and 15: Once the Scheme becomes operational the reduction in the number of pylons within the LCA will lead to a noticeable improvement in the character of the landscape. This will lead to a **low** magnitude of change, resulting in a **minor beneficial** level of effect.

LCA 8 – Central Rotherham Coalfield Farmland

- 3.3.48 Given that the land required to construct the Scheme does not fall within this LCA there will be no direct effects upon the physical landscape. Limited intervisibility between neighbouring LCAs is such that it is considered that there would be no noticeable effects upon the character of this LCA.

Local landscape character (the Scheme)

- 3.3.49 The physical landscape within the land required to construct the Scheme comprises a predominantly rural, encompassing a mixture of agricultural fields bounded by mature hedgerows and sections of the M1 corridor.
- 3.3.50 The landscape within the land required to construct the Scheme is considered to be of **low** sensitivity to development of this nature.
- 3.3.51 Once the Scheme becomes operational, and construction areas, access routes, and temporary diversions have been removed/reinstated, physical effects upon landscape features such as pasture, arable fields, field boundary hedgerows and woodland will be largely eliminated.
- 3.3.52 Electrical transmission infrastructure will remain a key characteristic of the landscape, however the removal of a considerable number of existing pylons, with fewer being proposed, particularly towards the west and north, will noticeably reduce the overall presence of electrical transmission infrastructure.
- 3.3.53 Years 1 and 15: There are likely to be some noticeable beneficial effects upon the character of the landscape once the Scheme becomes operational. This will lead to a **medium** magnitude of change resulting in a **minor beneficial** level of effect.

Visual amenity appraisal

- 3.3.54 The appraisal considers likely visual effects at Year 1 of the operational phase and at Year 15, once proposed reinstatement/replacement planting has established (residual effects).
- 3.3.55 Once operational, construction areas, access routes, and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
- 3.3.56 In the same way as during the construction phase of the appraisal, receptors that will experience views are either considered individually or grouped together where effects are likely to be of a similar magnitude:

Residential receptors (medium sensitivity)

- Residential receptors off the A618 to the south of the M1 including Guilthwaite Nurseries, Guilthwaite Cottage, High Winds, The Barn House and Guilthwaite Grange to the east, represented by RV02.
- The local topography is notably undulating, with the adjacent field sloping steadily downwards from north east to south west towards the Scheme and the M1 corridor to the north.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: Whilst the Scheme will involve the removal of six pylons from longer views, some of these are quite distant and would only have a slight beneficial effect. The Scheme does introduce two new pylons closer to these receptors, which are likely to be more readily noticeable in the foreground. It is anticipated that this will lead to a **low** magnitude of change, which will result in a **minor adverse level** of effect.
- Residential properties within the Spa Farm estate, including Spa Farm, Spa House and two cottages, approximately 250m to the west, represented by RV09.
- These properties are located on higher ground, with an elevated and largely unobstructed vantage point that permits panoramic views towards the Scheme.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: The Scheme involves the removal of three pylons from the foreground of the view, which has a slight beneficial effect, however this is largely offset by the introduction of two new pylons further to the east.
 - On balance it is considered that there will be a low magnitude of change, resulting in a minor **neutral** level of effect.
- Residential properties along the urban fringe of Whiston, located to the north/north east of the Scheme, and represented by RV04.
- Foreground views from these receptors are likely to be limited or partially obscured by existing woodland to the north of Whiston Brook, however because they are located on higher ground, those properties with an open southerly aspect are likely to experience more distant views of the wider Scheme to the south of the M1 corridor.

- Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
- Years 1 and 15: The Scheme involves the removal of four pylons from the western extent of the land required to construct the Scheme to the north of the M1 and two more distant structures beyond the M1 to the south. Whilst there will be two pylons added towards the east of the Scheme to the south of the M1, these will be more distant and partially obscured.
- On balance, it is anticipated that there will be a low magnitude of change, resulting in a minor beneficial level of effect.

Recreational and access receptors (medium sensitivity)

- Whiston Footpath no.10 (RV05) runs broadly north west–south east through fields to the north of the M1 corridor. Proximity to the Scheme is such that views will be unavoidable.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: The Scheme involves the removal of seven existing pylons towards its western extents, which will noticeably decrease the presence of electrical transmission infrastructure in westerly and south westerly views. Two pylons are added to the south of the M1, however these will be partially obscured.
 - On balance it is considered that there will be a **low** magnitude of change, resulting in a **minor beneficial** level of effect.
- Whiston Footpath no.12 (RV03) runs north eastwards between Long Lane to the south of the M1, passing through the land required to construct the Scheme, before passing under the M1 then crossing Pleasley Road and terminating at The Green in Whiston.
- Proximity to the Scheme is such that views will be unavoidable, particularly to the south of the M1.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: The Scheme involves the removal of several pylons which will no longer feature in views, most notably two to the south of the M1, but to a lesser degree four more towards the west of the land required to construct the Scheme. Two new pylons are introduced to the south of the M1, which are in close proximity to the route, such that views of the structures will occupy a notable proportion of the view for much of the route to the south of the M1.
 - On balance it is anticipated that there will be a medium magnitude of change, resulting in a **moderate adverse** level of effect.
- Treeton Footpath no.1 (RV06 and RV07) and Whiston Footpath no.7 (RV05) are located partially within a construction access route and partially within the land required to construct the Scheme.
- These PRoWs have 360-degree views of the Scheme such that views will be unavoidable

- Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: Several pylons will be removed from the sections of the Scheme that are visible to these receptors, five to the north of the M1 and two to the south, whilst only three new structures are proposed, one to the north and two to the south of the M1.
 - On balance it is considered that there will be a reduction in the overall presence of electrical transmission infrastructure present in the view, leading to a medium-low magnitude of change resulting in a **moderate to minor beneficial** level of effect.
- Treeton Footpath no.4 (RV09) and Whiston Footpath no.14 (RV01) and Whiston Footpath no.13 (RV02) are located partially within the land required to construct the Scheme, with largely unobstructed, elevated (in places) views.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: Several pylons will be removed from the sections of the Scheme that are visible to these receptors, two to the south of the M1 and five to the north (which are more distant and less visible). Two new pylons are proposed to the south of the M1 and one to the north.
 - On balance it is considered that there will be a slight reduction in the overall presence of electrical transmission infrastructure present in views, leading to a **low** magnitude of change resulting in a **minor beneficial** level of effect.

3.3.57 Whilst there are a number of additional PRowS that are likely to experience views of the Scheme, these views are likely to be sufficiently distant and/or obscured by existing intervening vegetation such that effects will be no greater than **minor adverse** once the Scheme becomes operational.

3.3.58 There is a network of highways within the wider study area; those that are likely to experience views of the Scheme are considered to be of **low** sensitivity:

- Long Lane and the M1 are located partially within the land required to construct the Scheme, crossing the route in two locations.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: Several pylons will be removed from the sections of the Scheme that are visible to users of these routes, with two new structures proposed to the south of the M1.
 - On balance it is considered that there will be a reduction in the presence of electrical transmission infrastructure present in the view, leading to a **medium-low** magnitude of change, resulting in a **minor to negligible beneficial** level of effect.
- The A630 Rotherway and Haworth Lane (RV08) are located towards the west of the land required to construct the Scheme, passing through it in two locations.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.

- Years 1 and 15: Several pylons will be removed from the sections of the Scheme to the east and west of these routes, and whilst two new structures are proposed to the south of the M1, these will be largely obscured by vegetation along the M1 embankment.
- On balance it is considered that there will be a considerable reduction in the presence of electrical transmission infrastructure present in views, leading to a **medium** magnitude of change, resulting in a **minor beneficial** level of effect.
- Pleasley Road (RV01, 02 and 03) is located predominantly on higher ground to the east of the land required to construct the Scheme, passing through it to the north of the M1.
 - Once operational, construction areas, access routes and temporary overhead line diversions will be removed/reinstated and will no longer feature in views.
 - Years 1 and 15: Whilst the Scheme will involve the removal of several pylons from longer views, some of these are quite distant and would be viewed oblique to the direction of travel, such that there would only be a slight beneficial effect for users of this route. The Scheme proposes two new pylons towards the east of the land required to construct the Scheme (south of the M1) which are likely to be more readily noticeable in the foreground.
 - It is anticipated that this will lead to a low magnitude of change, which will result in a minor to negligible **adverse** level of effect.

Construction Control Measures

- 3.3.59 The control measures listed in Table 3.3.2 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP prior to the construction and their implementation will be monitored by National Grid.

Table 3.3.2 Construction control and monitoring measures for Landscape and Visual

Potential receptor and/or impact	Control, enhancement and monitoring measures
Landscape and Visual amenity	<p>Production of a CEMP which will instil good practice construction working activities.</p> <p>Planning, positioning and directing construction lighting to reduce glare, light spill and skyglow, through such measures as outlined in Guidance Note 01/26: The Avoidance of Obtrusive Light (Institution of Lighting Professionals, 2026):</p> <ul style="list-style-type: none"> • using directional lighting to minimise glare beyond the construction working area or compound; • using only appropriately designed luminaires for the task at hand; and • limiting the quantity and illumination of the lighting to the minimum necessary. <p>Complying with the lighting levels, uniformity and other parameters of current and relevant lighting standards (so to avoid higher than recommended lighting levels):</p> <ul style="list-style-type: none"> • using visual screening, such as on-site spoil, between more sensitive visual receptors and construction light sources; • minimising light break-out above the horizontal (using ‘low cut-off’ and ‘full cut-off’ lighting systems), and using louvres, cowls and shields to prevent undesirable light break-out; and • reducing lighting levels outside working hours to suitable levels for safety and security. <p>Using automated devices to switch lights on and off according to activity/ambient light levels, and consider, if appropriate, using infrared floodlighting and CCTV systems for security.</p> <p>Specifying a sufficient quantity of lighting units to avoid the need for a smaller quantity of tall, wide beam lighting units to illuminate large areas.</p> <p>Applying BS 5837:2012 to avoid harm to all retained existing trees, scrub and hedgerow vegetation and their root systems during construction.</p> <p>Reinstating land disturbed to make way for construction areas and the underground cable route to its existing land use following completion of the construction phase.</p> <p>Providing continuous access to local tracks and PRoWs throughout the construction phase as far as is reasonably practicable.</p>

Operational Control Measures

- 3.3.60 The measures listed in Table 3.3.3 will be implemented during the operational phase of the Scheme and the appraisal has been undertaken assuming these measures are in place.

Table 3.3.3 Operational control and monitoring measures for Landscape and Visual

Potential receptor and/or impact	Control, enhancement and monitoring measures
Landscape and visual amenity	<p>An iterative design process with other members of the design and environmental team to ensure that likely impacts have been identified and wherever possible avoided or minimised.</p> <p>Embedded design measures, such as retention of existing screening.</p>

3.4 Cultural Heritage and Archaeology

Introduction

- 3.4.1 This section details the Cultural Heritage and Archaeology baseline conditions and the environmental appraisal of the potential Cultural Heritage and Archaeology impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.4.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; and Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.4.1 Cultural Heritage Receptors.

Study Area

- 3.4.3 A study area of 500m surrounding the land required to construct the Scheme was applied for all designated heritage assets and non-designated heritage assets. This assessment follows best practice guidance produced by the Chartered Institute for Archaeologists on the compilation of desk-based assessments (Chartered Institute for Archaeologists, 2020).

Consultation

- 3.4.4 In their response to the Form B consultation, Historic England highlighted the potential for impacts, particularly to the scheduled monument, Blue Man's Bower moated site (SM1) and its setting. This section sets out the appraisal of impacts, including to this receptor and its setting.

Baseline

Designated Heritage Assets

- 3.4.5 There are no world heritage sites, battlefields or registered parks and gardens within the land required to construct the Scheme or study area.
- 3.4.6 There is one scheduled monument within the land required to construct the Scheme (SM1).

- 3.4.7 There is a further scheduled monument, one conservation area, and 14 listed buildings within the 500m study area. These are discussed below. The assets are shown on Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.4.1.

Scheduled Monuments

- 3.4.8 There are two scheduled monuments (SMs) located within the 500m study area: Blue Man's Bower moated site (SM1) located partially within the land required to construct the scheme and Canklow Hill earthworks (SM2) located within the 500m study area.
- 3.4.9 Blue Man's Bower (SM1) is located partially within the land required to construct the Scheme with the overhead lines intersecting with the northern element of the scheduled area. The scheduled monument comprises a medieval moated site with an outer enclosure and fishponds. The monument is an unusual example due to the fact that a natural feature was used to create an outer enclosure around the moated site. Although no longer filled with water, the moat and fishponds are sufficiently waterlogged to enable the survival of organic and palaeoenvironmental remains; this highlights the asset's evidential value which contributes to its significance. In terms of its historical value, SM1 is a significant type of medieval monument which is important for the understanding of the distribution of wealth and status within the rural countryside of South Yorkshire during this period. Despite the establishment of the M1 motorway to the south, the monument's rural setting, which contributes to its significance, is maintained due to the surrounding open greenspace and mature vegetation, the latter which screens the M1 and link roads from view. This forms part of the setting of SM1. The scheduled monument SM1 is assessed as **high** value.
- 3.4.10 Canklow Hill earthworks (SM2) is located approximately 380m north from the northern access track of the land required to construct the Scheme. Only the southern corner of the scheduled area falls within the 500m study area. The monument is located within Canklow Woods, classed as ancient woodland, and comprises a later prehistoric enclosure, bank and terrace complex. Numerous features including banks, enclosures, bell pits, quarries, ditches and banks have been identified suggesting multi-period activity within the asset dating from the Iron Age, Romano-British (35) and post-medieval periods, also including various prehistoric flint tools (38), metal objects and pottery. SM2 derives significance from its historical value; the monument is associated with woodland settlement activity and provides evidence of how such a landscape was used by humans spanning several periods. It also holds evidential value, with potential for additional archaeological features to be present that would lead to further understanding of past human activity that took place within Canklow Woods. The setting of the monument is informed by the woodland which was occupied by humans many centuries ago and contributes to its significance. A heritage trail around the edge of the scheduled area allows the monument's setting to be 'experienced' through the woodland surroundings and information provided about how people lived in the woods in the past including aspects such as tool making. The setting of SM2 does not extend to the land required to construct the Scheme. SM2 is assessed as **high** value.

Conservation Areas

- 3.4.11 There is one conservation area (CA) partially located within the 500m study area, Whiston Conservation Area (CA1), approximately 200m north of the land required to construct the Scheme. There is currently no conservation area appraisal for this conservation area. The conservation area encompasses the medieval historic core of Whiston Village, including several listed buildings. The Grade II* listed Church of St.

Mary Magdalene (LB6) is located in the centre of the village and is a focal point of the historic core. The built form of the conservation area is characterised by two-storey stone dwellings fronting directly onto the street. The conservation area retains its rural character, despite its urban setting, which reflects its development as a farming settlement. This is highlighted by the many examples of open greenspace and mature vegetation within the conservation area. The wider setting of the conservation area, which contributes to its significance, is characterised by the agricultural landscape and former farmsteads surrounding the village (Rotherham Borough Council, June 2014). This aspect of setting can be experienced visually from the southern edge of the conservation area. The Scheme does fall within this wider agricultural landscape, and it lies out of view from the conservation area, beyond the steep valley sides and ridgeline to the south west. Whilst the Scheme is within the asset's wider setting, the contribution that it makes to the asset's significance is minor. The conservation area is of **medium** value.

Listed Buildings

- 3.4.12 There are 14 listed buildings located within the 500m study area; of these, six (LB1-6) are located within Whiston Conservation Area (CA1). The other eight listed buildings (LB7-14) are located outside of the conservation area.
- 3.4.13 A building that reflects Whiston's origins as a medieval village is the 12th century Grade II* listed Church of St. Mary Magdalene (LB6), located approximately 500m north east of the land required to construct the Scheme. The church (LB6) lies within the centre of Whiston and has been a focal point for the community since the medieval period. The setting of the church (LB6) is informed predominantly by its position at the highest point of the village topographically. This demonstrates the church's importance to the community in the past, which contributes to its significance. Other aspects of the church's setting include the open greenspace of the church yard and mature vegetation surrounding the building, and two Grade II listed structures: the Village Stocks (LB4), dated 1876; and Headstone to Rebekah Cutt (LB5). As suggested by the Historic Environment Record (HER), the church is an example of a small medieval church which has since become an aisle to a much larger Victorian structure. These assets (LB4, LB5, LB6) share group value, derived from their relationship with each other and their communal and historical value. The church (LB6) also holds aesthetic value which contributes to its significance. The group setting of the church (LB6), the Village Stocks (LB4), and the Headstone (LB5) do not extend to the Scheme. These designated heritage assets (LB4, LB5, LB6) are all of **high** value.
- 3.4.14 The 13th century Grade II* listed Whiston Hall Barn (LB1) provides further evidence of Whiston's medieval past approximately 380m north east from the land required to construct the Scheme. Whiston Barn (LB1), although considerably altered, is of national significance. The barn is part of a group of three listed buildings (LB1-3) located on the north western side of CA1. The other two buildings are both Grade II listed and comprise Whiston Hall (LB3), a former manor house and possible former manorial centre, and a 17th century Stable and Granary (LB2), located approximately 420m and 400m north east of the land required to construct the Scheme respectively. Together with the barn (LB1), these buildings belonged to the manorial estate of Whiston Hall Farm, purchased by the Sitwell family in 1823 (Whiston Heritage Society, n.d.). The HER indicates the original building core of Whiston Hall (LB3) may date to the 16th century, with an 18th century extension, and lastly, modern period alteration to become a dwelling. The three listed buildings (LB1-3) collectively share

a group setting informed by their location to each other within the grounds of the former manorial farming estate, the original sandstone boundary wall of which is still defined along Chaff Lane and High Street. This group setting contributes to the significance of these listed buildings but does not extend to the Scheme. The significance of these buildings is derived from their historical and aesthetic value and as a group they make a positive contribution to the character of CA1. These listed buildings (LB1-3) are of **high** value.

- 3.4.15 Three Grade II listed farm buildings (LB11, LB12 and LB13) associated with former post-medieval farmsteads are located within the 500m study area. A farm building (LB11) associated with Guilthwaite Hall Farm along Pleasley Road is located approximately 470m east from the land required to construct the Scheme in the nearby hamlet of Guilthwaite, and dates to the 17th century. There are two farm buildings (LB12, LB13) associated with Spa House Farm in Treeton approximately between 30m and 80m west of the western access rights of the Scheme, dating to the mid-18th century. The farm buildings (LB11 and LB12) derive significance from their historical value, as they illustrate the aspect of day-to-day running of farms in the past. The agricultural settings of these farm buildings, which contribute to their significance, are still maintained. The access tracks of the land required to construct the Scheme extend into the setting of LB12 and LB13, and encroach on the wider setting of LB11. The listed buildings (LB11, LB12 and LB13) are of **medium** value.
- 3.4.16 The other listed buildings within the 500m study area comprise two Grade II listed 19th century mileposts (LB7 and LB10). LB10 is located approximately 35m east of the eastern access track of the Scheme on the existing A618 Pleasley Road. LB7 is located approximately 425m north of the Scheme on the existing A631 Moorgate Road. The significance of these mileposts is limited to their historical value which demonstrates how these signs were designed to aid travellers in reaching their destination prior to the motorisation of road travel. The setting of these mileposts, which contributes to their significance, is informed by their original roadside location which has remained unchanged since their erection in the 19th century. The settings of the mileposts (LB7, LB10) do not extend to the Scheme, and they are of **medium** value.
- 3.4.17 The Poplars (LB8) and The Heights Farmhouse (LB14) are two Grade II listed buildings located approximately between 420m and 500m east from the land required to construct the Scheme. The Poplars has a central core dating to the late 15th century or 16th century, rebuilt early 17th century, and extensive 20th century alterations rendering it of historical and architectural significance due to retention of fabric. The Heights Farmhouse dates to the mid-18th century, and draws significance as a historic farmhouse and retaining historic fabric. The agricultural settings of the buildings are still maintained which contributes to their significance. The buildings are situated at a distance from the Scheme and their settings to do not extend into the Scheme. The listed buildings (LB8, LB14) are of **medium** value.
- 3.4.18 The Grade II listed building 25 Bole Hill (LB9) is located approximately 155m south east from the western access tracks of the Scheme. The building is dated to 1655 with later 20th century additions and holds historic significance representative of a building from this time period, and architectural significance due to retention of historic fabric. The setting of the building is within a modern housing estate and does not extent into the land required to construct Scheme. It is of **medium** value.

Non-Designated Heritage Assets

- 3.4.19 This baseline includes 42 non-designated heritage assets dating from the prehistoric to post-medieval period. The assets are shown on Figure 3.4.1.
- 3.4.20 There are four non-designated heritage assets (12, 31, 40, 41) located within the land required to construct the Scheme which range from prehistoric to Roman date.
- 3.4.21 The other 38 non-designated heritage assets within the 500m study area date from the prehistoric to post-medieval period.
- 3.4.22 These assets are discussed and assessed below in chronological order of period, along with their context in relation to the Scheme and 500m study area.

Prehistoric to Iron Age (500,000 BC – AD43)

- 3.4.23 Worked flints of Early Mesolithic to Late Bronze Age date have been recorded within the land required to construct the Scheme itself, including around 80 flint finds, in the eastern part of the land required to construct the Scheme (12) and in the south western corner adjacent to Long Lane (31). The artefacts were scattered on the surface and were first recorded in the 1940s, although other flints were also recovered in 1969. The significance of these find locations is limited by the displacement from their original context, likely having been disturbed by ploughing activity. However, the density and range of tool types which included worked flakes, scrapers, blades and arrowheads, combined with the knowledge that further flint finds are recorded within the vicinity, attribute both historical and evidential value to these heritage assets. Whilst it is possible that further finds of a similar nature are likely to be present within the land required to construct the Scheme, the archaeological potential is limited.
- 3.4.24 A possible Bronze Age barrow (4) is located approximately 365m east of the southeastern access track of the Scheme. The HER has identified earthworks similar to that of a barrow cemetery, however there is limited evidence regarding the origins of the cemetery. The asset likely holds a relationship to the irregular enclosure (5) located within proximity to the south east. The asset is of low value due to its potential to reveal further information regarding human activity in the area.
- 3.4.25 Prehistoric flint findspot locations have been recorded within the 500m study area. The majority of these (1, 2, 10, 13, 14, 16, 17, 19, 20, 21, 22, 29, 30) are located south of the M1, between 50m to 500m, to the south east, south, west and south west of the land required to construct the Scheme. Two further findspot locations of prehistoric flint scatter (38) approximately 30m north of the northern access rights and Neolithic flint scrapers, cores and a blade (11) marked by the HER approximately 20m north of the Scheme. As with the prehistoric findspots recorded within land required to construct the Scheme itself (12, 31), these artefacts are all surface finds and were not recovered from in situ features or deposits. The original setting of these artefacts has been lost through their removal from their original context, as well as the changing development of the landscape over time. However, these surface finds do derive significance from their historical and evidential value, illustrating that human activity was present moving through the area from at least the Mesolithic period onwards, along with suggesting potential for further evidence from the prehistoric period to be recovered within the study area.
- 3.4.26 All of the prehistoric findspot locations within land required to construct the Scheme and study area (1, 2, 10, 11, 13, 14, 16, 17, 19, 20, 21, 22, 29, 30, 31, 38) outlined

above are of low value. However, should substantial features and deposits dating to this period be identified, such features would likely be of **medium** value.

- 3.4.27 Canklow Wood Iron Age and Romano-British Settlement (35) is located approximately 30m north of the land required to construct the Scheme from the closest point. Only the southern portion of this asset falls within the 500m study area. This asset is an extension of Canklow Hill earthworks (SM2) that extends beyond the confines of the scheduled area. Previous archaeological surveys revealed Iron Age to Romano-British period activity extending further than the original scheduled earthworks. This asset (35) comprises of a complex of Iron Age or Romano-British enclosures, lynchets, a drove road and associated earthworks. In particular, a topographical survey conducted in 2002 identified linear banks interpreted as the remains of a field system. A number of undated cairns that may represent clearance of stones from agricultural land were also identified. Further potential Iron Age to Romano-British period cropmarks (39) have been observed approximately 70m east of the Scheme. Studies of aerial imagery have observed a ditch, field boundary and trackway suggestive of an Iron Age to Romano-British period rural agricultural landscape. Should this prove to be the case, it is likely that this landscape could be associated with the known activity to the west and north west of the Scheme at the scheduled monument (SM2), and the associated findings at Canklow Wood (35) outlined above. The extended size and interpretation of this settlement builds on the historical and evidential value attributed to the area occupied by the scheduled monument (SM2). These assets (35 and 39) are therefore of no less significance to the scheduled monument despite their non-designated status, and are thus equally weighted in value. The scheduled monument informs the setting of these assets (35 and 39) and contributes to their significance and overall value. The settlement (35) and nearby likely agricultural field systems (39) illustrate that human activity was concentrated in the area during the Iron Age to Romano-British periods, and are assessed as potentially **high** value.

- 3.4.28 In the study area to the east and south of Whiston, several sets of cropmarks (5, 7, 32, 37) have been identified from aerial photography and geophysical survey (Archaeological Research Services, 2019). A multi period earthwork within Treeton Wood (36) is identified by the HER approximately 370m south of the land required to construct the Scheme at its closest point. Although these cropmarks are largely undated, they are thought to represent evidence of an extensive agricultural landscape of Iron age to Romano-British field systems. It is possible these systems extended within the vicinity of the land required to construct the Scheme, although extensive arable agriculture over the centuries has likely removed surface evidence of this activity. These assets are assessed of low value, albeit should substantial features be identified such features would likely be of **medium** value.

Romano British (AD 43-AD 410)

- 3.4.29 The HER identifies two non-designated heritage asset records (40, 41) from the Romano-British period within the land required to construct the Scheme. Five assets of Roman date are however also recorded within the 500m study area.
- 3.4.30 Romano-British period activity is well documented within the wider area outside of the study area. A non-extant fort was located at Templeborough, Rotherham, approximately 3km north west of the Scheme. The Templeborough fort was laid out around AD 54 and likely abandoned in the 3rd century. A broadly north to south aligned Roman Road (40) has been recorded between Templeborough and a fort at Chesterfield, dissecting the eastern element of the land required to construct the

Scheme. A second broadly east to west aligned Roman Road (41) also dissects the southern element of the Scheme between Catcliffe and Oldcotes.

- 3.4.31 It is not known how much of the Templeborough to Chesterfield Roman Road (40) survives. The HER indicates that a railway worker in the mid-19th century identified a paved road below the surface while digging an embankment ditch. It is likely much of the fabric of the Roman Road was removed during construction of the A618. The HER records no archaeological investigation of the road within the 500m study area. The setting of the road (40) is informed by the existing A618 which has been used as a travel route since the original road was constructed. This makes a positive but limited contribution to the value of the asset (40). The road derives significance from its historical value through its association of the current road with the past. However, the evidential value of this asset to yield new information is limited due to the existing modern infrastructure, with limited potential for remains of the original Roman Road to survive. The Templeborough to Chesterfield Roman Road (40) is of low value.
- 3.4.32 The evidential value makes a more substantial contribution to the significance of the Catcliffe to Oldcotes Roman Road (41). The HER suggests that two sections of this road were uncovered during an excavation in 1954 outside of the study area, however this indicates a likely potential for surviving remains along further sections of the road within the study area. Remains of this type would yield important information about the built fabric of Romano-British period infrastructure. There is also potential to discover further evidence of Roman activity such as isolated settlement. On account of its historical and evidential value, the asset (41) is assessed as **medium** value.
- 3.4.33 There is evidence of a Romano-British phase of settlement at Canklow Wood (35/SM2) partly within the 500m study area. Although there are no recorded archaeological features relating to Romano-British settlement within the land required to construct the Scheme or immediate vicinity, in the wider area, cropmarks of numerous enclosed probable farmsteads and field systems have been identified (Archaeological Research Services, 2019). Although cropmark features have not been recorded within land required to construct the Scheme, it is possible that similar remains could survive.
- 3.4.34 Activity from this period is further attested by four Roman findspots comprising coins (3, 18) which are recorded by the HER approximately 250m west and 350m east of the Scheme, and pottery (15, 23) approximately 100m west of the southern element of the Scheme and 30m east of the Scheme, respectively. These artefacts were found on the surface and not within in situ archaeological features or deposits, which contributes negatively to the significance of the assets. The pottery (15, 23) dated to AD 43 to AD 409. Two of the coins (3, 18) are identified to Emperor Valens, and one to Emperor Constans (AD 337-350). The positive dating of these assets affords them some historical value, although this is limited due to their lack of archaeological context. They do, however, indicate nearby potential settlement activity. The coins (3, 18) and pottery (15, 23) are of **negligible** value.

Early Medieval (AD410-AD1066)

- 3.4.35 The HER identifies no non-designated heritage asset records from the early medieval period within land required to construct the Scheme.
- 3.4.36 There is a general lack of archaeological evidence in this period; this is particularly true for the Coal Measures region of South Yorkshire where the Scheme is located. However, the village of Whiston likely has an early-medieval period origin based on

three distinct entries in the Domesday Book, in which the village is named as both Widestan and Witestan (and also Wideotha); these being Old English (Anglo-Saxon) words meaning “white stone” (Whiston Heritage Society, n.d.).

Medieval (AD1066-AD1540)

- 3.4.37 There are no recorded medieval period non-designated heritage assets within the land required to construct the Scheme. Four assets are recorded by the HER within the 500m study area.
- 3.4.38 The site of the formerly Grade II* listed Haworth Hall (9) of c. 1500 origin, with late 16th, 17th and 18th century alterations, is marked by the HER approximately 25m south-east of the land required to construct the Scheme at the closest point. The hall was demolished in 1965 associated with the construction of the M1/Sheffield Parkway interchange. Similar in nature to Whiston Hall Barn (LB1), it provides further evidence of Whiston’s medieval past. The building’s original setting is no longer extant within the landscape. The setting of the hall therefore does not contribute to the significance of the asset and does not extend to the land required to construct the Scheme. The significance of the building is derived from its historical and evidential value. The site of the hall is of negligible to low value.
- 3.4.39 An undated but possible medieval to post-medieval trackway (39) has been identified as part of the English Heritage National Mapping Programme approximately 40m south of the eastern element of the land required to construct the Scheme, leading south west from where the Templeborough to Chesterfield Roman Road (40) and Catcliffe to Oldcotes Roman Road (41) cross. The setting of the trackway is informed by the previously existing Romano-British roads having remained in continuous use up to this period, with this trackway forming an off-shoot to the crossing point. This makes a positive but limited contribution to the value of the asset (39). The trackway derives significance of historical and evidential value through its association to the continued use of the Romano-British period roads, and that there is potential for remains of the trackway to survive. The trackway may also be suggestive of nearby roadside, agricultural and possibly even settlement activity. The trackway (39) is of low value.
- 3.4.40 There are two medieval period findspots recorded within the 1km study area: a findspot of eight pottery sherds (25) approximately 63m south east of the land required to construct the Scheme, and 40 medieval pottery sherds (24) discovered within an agricultural field approximately 35m east of the land required to construct the Scheme. No date or description is given for the pottery at either location, other than (24) being a surface find. As a surface find, those sherds were therefore not associated with an in situ archaeological context and may have been disturbed by ploughing activity. The assets (24 and 25), therefore, have limited historical and evidential value and are assessed as **negligible** value.
- 3.4.41 Medieval period activity within the study area appears to be dispersed, with the land required to construct the Scheme itself on the rural periphery of settlement activity in this period. Furthermore, it may reflect a lack of focus on rural archaeology as well as the underrepresentation of medieval archaeology within South Yorkshire, which is often reliant upon pottery finds. Therefore, it should be noted that the relative absence of recorded medieval remains within the vicinity of the Scheme does not preclude the potential for unknown remains from this period to exist within the land required to construct the Scheme.

Post-Medieval (AD 1540 – AD 1901)

- 3.4.42 There are no non-designated post-medieval period assets recorded within the land required to construct the Scheme, but there are five recorded within the 500m study area.
- 3.4.43 Industrial activity increased at Whiston during the post-medieval period. The agricultural industry also increased production in the post-medieval period, an example of which includes Whiston Mill (34) approximately 50m east of the northern access track of the Scheme. The mill (34) comprises two corn mills, one of which is no longer extant. The extant water wheel is situated on the River Rother and illustrates through its historical value how industry in this period harnessed natural resources to increase agricultural output. The asset also holds evidential value as there is potential for archaeological remains associated with the non-extant mill to survive below-ground. The setting of Whiston Mill (34) is informed by its location on the river which was used to power the waterwheel, and this contributes to the significance of the mill. Overall, Whiston Mill is assessed as **medium** value.
- 3.4.44 Several farmsteads were established around the periphery of Whiston village in the post-medieval period. Abdy Farm (42) dating to 1749 is an example of this, located approximately 220m north east of the land required to construct the Scheme on the corner of The Green, on the edge of the urban settlement of Whiston. Although the farm (42) is not recorded by the HER, it can be observed on 19th century maps. This asset has been included within this assessment on account of its heritage value and proximity to the Scheme using professional judgement. The farm is also located within Whiston Conservation Area (CA1). On 19th century maps the farm comprised a complex including the main farmhouse and several other buildings, set within an area of enclosed land. Although a few of the outbuildings are no longer extant, the main farmhouse and a majority of the other buildings survive. The setting of the farm is informed by its location on the edge of the Whiston and a rural agricultural landscape to the south, which contributes to its significance. This setting of the farm does not extend to the land required to construct the Scheme and is broadly confined to its own bounds. Although this farm is not listed, the asset holds aesthetic and historical value as an example of a historic farmstead associated with Whiston's identity as a farming village in the post-medieval period. Abdy Farm (42) is of **low** value.
- 3.4.45 Two timber framed buildings (6) are located approximately 77m south east of the access rights to the east from the land required to construct the Scheme. The asset comprises the remains of two separate post-and-truss buildings constructed between 1540 and 1700 and later incorporated into a range of stables and outhouses, labelled on 19th century mapping as Guilthwaite Grange, to the north east of Guilthwaite Hall. Some of the timbers have been dated dendrochronologically to 1597, a late date for a timber framed building of this type. The asset derives significance from its evidential value through the information held within the timber remains and historical value as a partially surviving example of an open hall type timber building(s). The setting of the asset is informed by the enclosed nature of the range of buildings within the immediate vicinity and its location adjacent to the A618, a road that has itself been observed on 18th century mapping. The setting of this asset does not extend to the Scheme and makes a limited contribution to the overall **low** value of the asset.
- 3.4.46 Guilthwaite Spa (8) and a post-medieval Dovecote (26) are located approximately 20m west of the access rights Scheme at Treeton Spa. Guilthwaite Spa was a small house constructed over a well, with a bath large enough to hold several people. The minerals in the water were reputed to cure many ailments and a headstone in the

front of the wall bears the date 'Anno Dom 1666'. The HER record is unclear as to whether Guilthwaite Spa is still extant within the landscape but does suggest it was in operation between AD 1666 and 1719. The 17th century was a time which saw a rise in popularity of spas including the medicinal uses of spring water and this asset holds historical value as an example of the continued use of spa treatments from the start of the post-medieval period onwards. The 19th century dovecote is incorporated into a three-storey farm building at Treeton Spa and has a historical and aesthetic value as part of Treeton Spa itself. Whilst their setting and context broadly confined to their immediate grounds which highly contributes to their significance, the land required to construct the Scheme extends into the wider rural setting. Overall, these assets are assessed as **medium** value.

- 3.4.47 The Poplars Dovecote (28) associated to Poplars Farm (LB8) is located approximately 500m south east of the land required to construct the Scheme. The dovecote is situated within the courtyard of the historic farmstead and likely was added at a later date. It holds associative value to the listed building and historical significance. It is of **low** value.

Modern (AD1901 – Present)

- 3.4.48 There are no non-designated heritage assets from the Modern period recorded within land required to construct the Scheme or 500m study area.

Undated

- 3.4.49 An undated cropmark (32) has been identified as part of the English Heritage National Mapping Programme located approximately 800m south east of the land required to construct the Scheme. The HER provides no further details for this asset. This asset holds evidential value as potential undated archaeological feature or deposit. The cropmarks may be representative of nearby roadside, agricultural and possibly even settlement activity associated with nearby trackway (39) or Romano-British roads (40 and 41). The setting of the location does not extend to the land required to construct the Scheme, with the setting and context of the asset broadly confined to its immediate grounds, which makes a minor contribution to its significance. The cropmarks are of **low** value.

Potential Construction Impacts

- 3.4.50 It is anticipated that the Scheme would not cause substantial harm to the setting or physical form of recorded heritage assets within the land required to construct the Scheme or the 500m study area during the construction phase, as all impacts would be temporary and reversible. The temporary and minor impacts are detailed below.
- 3.4.51 A temporary direct impact was identified to the high value Blue Man's Bower (SM1) due to traffic and construction noise along Long Lane during the removal of overhead line. The monument and its rural setting, which contributes to its significance, would be maintained due to the surrounding open greenspace and mature vegetation, the latter of which screens the M1 and link roads from view. Due to the temporary nature of the construction works, the asset would experience a direct impact that would be fully reversible following completion of construction works at the Scheme. The direct impact is considered to be adverse to the significance of the asset and not considered to be significant. However, traffic management measures such as controlling the level of traffic in the setting of the scheduled monument at any one time could be beneficial (not essential) to reduce the temporary change to the setting

of the asset. Overall, the magnitude of impact would be **low** resulting in a **minor adverse** level of effect, which will be temporary in nature.

- 3.4.52 A potential temporary impact due to traffic noise was identified to Whiston Conservation Area (CA1) located approximately 200m north of the land required to construct the Scheme, to be used for access, at its closest point. The wider setting makes a contribution to the asset's significance and the access point does fall within this wider agricultural landscape; however, it lies out of view from the conservation area, beyond the steep valley sides and ridgeline to the south west. However, increased noise levels could detract negatively from the way in which the conservation area can be experienced. The temporary impacts would be fully reversible following the completion of construction works. Due to the temporary nature of this activity, the potential impact is not considered to be significant. However, traffic management measures such as controlling the level of traffic in the setting of the conservation area at any one time could be beneficial (not essential) to reduce the potential temporary change to the setting of the asset. Overall, the magnitude of impact would be **low** resulting in a **minor adverse** level of effect, which will be temporary in nature.
- 3.4.53 Similarly, listed buildings (LB12 and LB13) are situated adjacent west to the south western access track of the Scheme. The assets would experience an indirect temporary short-term impact from construction of the Scheme, primarily from increased noise levels. The assets will experience a visual impact due to the exposed setting of the buildings facing out on the vehicular access route which would impact the setting of the assets. The temporary impact would be fully reversible following the completion of construction works. Due to the temporary and reversible nature of this activity, the potential impact is not considered to be significant. Based on this, traffic management measures could be beneficial to reduce the potential impact on the setting of these assets. Overall, the magnitude of impact would be **low** resulting in a **minor adverse** level of effect, which will be temporary in nature.
- 3.4.54 Assets 12 and 31 would experience a direct impact from the construction of the Scheme. The findspot assets of around 80 prehistoric flint finds, in the eastern field (12), and in the south-western corner adjacent to Long Lane (31) within the land required to construct the Scheme, both of low value, are suggestive of potential archaeological remains of this period to survive, and as such would experience an impact from the construction of the Scheme, which would not be reversible. However, based on their current low value/significance and based on insufficient evidence regarding the activity of these time periods, the construction impact would not be significant. In addition, there is already the existing Brinsworth Substation within the land required to construct the Scheme and the archaeological potential for unknown remains to be discovered is low. Overall, the magnitude of impact would be **low** resulting in a **minor adverse** level of effect.
- 3.4.55 Assets 40 and 41 are **medium** value assets that intersect with the removal of the overhead line. The construction works for the removal of several pylons will cross over at certain points and cause a temporary short-term impact on the assets through increased noise levels and visual impact. However, as this is temporary and reversible, the impact is not considered to be significant. Overall, the magnitude of impact would be **low** resulting in a **minor** adverse level of effect, which will be temporary in nature.
- 3.4.56 Several non-designated assets have been identified for potential temporary impacts from construction activity, including visual impact of construction activity, construction

noise and increased traffic flow due to construction. However, the temporary nature of these impacts would not be significant as the affected buildings are non-designated and of low value. Therefore, no heritage mitigation measures will be required for these assets.

Potential Operational Impacts

- 3.4.57 Given the type of works proposed, i.e. infrequent temporary use of an existing access for maintenance, it is not anticipated that there would be any likely significant direct or indirect level of impact on the listed buildings as a consequence of operation of the Scheme. Once the Scheme becomes operational, and construction areas, access routes, working areas and temporary overhead line diversions have been removed/reinstated, the setting of the designated assets will be reinstated and there is potential for both beneficial and adverse effects arising from the Scheme.
- 3.4.58 There is low archaeological potential for prehistoric and Roman remains within the study area. The majority of assets are primarily limited isolated findspots that have lost their original context and setting, albeit for Cranklow Wood (SM2/35) settlement. As such, these findspots have not been assessed in the operational phase due to the absence of impact on setting.
- 3.4.59 Operational impacts have been identified for the high value asset Blue Man's Bower (SM1) where the existing overhead line is proposed to be removed. The direct impact, comprising of the removal of several existing pylons close to where the asset is located, will positively contribute to the experience and preservation of any potential unknown archaeology and beneficial changes to the setting of the asset. Overall, there will be a **medium to low** magnitude of change resulting in a **minor** beneficial level of effect.
- 3.4.60 Assets 40 and 41 are **medium** value assets that intersect with the removal of the overhead line. The removal of several existing pylons where the assets are located will have beneficial changes, reverting to a more appropriate setting. The assets primarily draw significance from their historical value with limited remains of the former Roman roads. The removal of the pylons and overhead line would be a benefit to the assets and a notable improvement from a visual perspective. The permanent change is anticipated to be **low** magnitude of change resulting in a **minor** beneficial level of effect.

Construction Control Measures

- 3.4.61 The control measures listed in Table 3.4.1 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP and their implementation will be monitored by National Grid.

Table 3.4.1 Construction control and monitoring measures for Cultural Heritage and Archaeology

Potential receptor and/or impact	Control, enhancement and monitoring measures
Blue Man's Bower (SM1) Whiston Conservation Area (CA1) Listed buildings LB12 and LB13	Standard traffic control measures will be included in a Construction Traffic Management Plan (CTMP), to ensure the noise levels are kept to a minimum. Production of a CEMP which will instil good practice construction working activities.
Heritage assets 12 and 31 Heritage asset 41	Preservation by record.

Operational Control Measures

3.4.62 No operational phase control measures are proposed.

3.5 Air Quality

Introduction

- 3.5.1 This section details the Air Quality baseline conditions and the environmental appraisal of the potential Air Quality impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.5.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; and Appendix D, Long Lane New Overhead Lines Drawings.

Study Area

Construction Dust Risk Assessment

- 3.5.3 In accordance with the Institute of Air Quality Management (IAQM) construction dust guidance (IAQM, 2024), the study area for the construction phase dust risk assessment will be:
- Up to 250m from the locations of demolition, construction and earthworks activities for human receptors and up to 50m for ecological receptors; and
 - Up to 50m from the route(s) used by construction vehicles on the public highway, up to 250m from the Scheme's entrance(s).
- 3.5.4 The area within 250m of the land required to construct the Scheme and within 50m of the construction routes is largely comprised of rural uninhabited fields.

Construction and Operational Phase Vehicle Emissions: Human Receptors

- 3.5.5 The Air Quality study area for vehicle emissions is defined as the area within 200m of any roads that exceed the traffic change criteria detailed in the IAQM Development

Control guidance (IAQM, 2017). The screening criteria for vehicle emissions assessment is as follows:

- A change in Light Duty Vehicle (LDV) flows of >100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA), or >500 AADT elsewhere; and
- A change in Heavy Duty Vehicle (HDV) flows of >25 AADT within or adjacent to an AQMA, or >100 AADT elsewhere.

3.5.6 During the construction phase, the screening criteria would not be exceeded at any point. Therefore, a construction phase air quality assessment of vehicle emissions has been scoped out.

3.5.7 During the operational phase of the Scheme, it is understood that the only traffic generated would be associated with infrequent repair, routine maintenance and inspection activities (assumption of less than 10 vehicles per year). This number of vehicle movements is well below screening thresholds, therefore an operational phase air quality assessment of vehicle emissions has been scoped out.

Consultation

3.5.8 Table 3.5.1 provides a summary of the issues raised and agreed during consultation with respect to air quality and how they have been addressed.

Table 3.5.1 Consultation taken with the relevant local authority

Consultee/date	Summary of issues raised/agreed
Sheffield City Council (SCC), 24/04/2026	A request was submitted to SCC to view the latest air quality annual status report available, or to view the 2025 monitoring data undertaken by the council. No response was received.
RMBC 24/04/2026	A request was submitted to RMBC to view the latest air quality annual status report available, or to view the 2025 monitoring data undertaken by the council. A response was received on 06/05/2026 with the 2025 annual status report.
SCC, 28/04/2026	A follow up email was sent to request to view SCC's latest air quality status report. No response was received.

Baseline

3.5.9 The Scheme is located entirely within the jurisdiction of RMBC; however the land required to construct the Scheme is located approximately 1.8km east of SCC's jurisdiction at its nearest point. For the purposes of setting out the baseline conditions for the Scheme, data from SCC has therefore been considered alongside data from RMBC.

3.5.10 As required by the Environment Act (1995, amended 2021), SCC and RMBC have both undertaken a review and assessment of air quality within their areas of jurisdiction. This process has indicated that within SCC's authority area there are three declared AQMAs and within RMBC's authority area there are two declared AQMAs.

- 3.5.11 The Scheme is located within one of RMBC's former AQMAs, Rotherham AQMA 1. This AQMA was declared in 2002 for exceedances of annual mean NO₂ concentrations and covers the area along the M1 between Upper Whiston (to the east of the land required to construct the Scheme) and the boundary with SCC (to the west of the land required to construct the Scheme) and extending on either side to encompass Brinsworth and Catcliffe. This AQMA was revoked by RMBC on 1 June 2025.
- 3.5.12 The Scheme is also located within 2km from the SCC AQMA Sheffield Citywide AQMA, which was declared in 2010 for exceedances of 1-hour and annual mean NO₂ and 24-hour mean particulate matter less than 10 micrometres in diameter (PM₁₀). These AQMAs are displayed in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.5.1.
- 3.5.13 As the Scheme is located within a recently revoked AQMA and within 1km of another AQMA, there is potential for the Scheme to result in increased human exposure to air pollutants in an area of existing poor air quality. Air quality monitoring data undertaken by RMBC and SCC in the vicinity of the Scheme has been reviewed to quantify the baseline concentrations of air pollutants. A project-specific monitoring survey has also been commissioned, to better inform the baseline in areas near the Scheme where there is no local authority air quality monitoring.
- 3.5.14 The area within 250m of the land required to construct the Scheme and within 50m of the construction routes is largely comprised of rural uninhabited fields. There are residential developments 85m to the northeast, 300m to the north, and 1,100m to the southwest of the Scheme.
- 3.5.15 There is one ecological receptor located within the construction dust study area, Canklow Wood LWS, an ancient woodland site located approximately 20m north west of the land required to construct the Scheme.

Air Quality Monitoring Data

- 3.5.16 SCC and RMBC currently monitor air quality across their administrative boundaries using a combination of fixed automatic monitoring stations and non-automatic monitoring sites (NO₂ diffusion tubes). None of the automatic monitoring sites for either local authority are located within 3km of the Scheme and are therefore not considered to be representative of air quality in and around the Scheme.
- 3.5.17 SCC and RMBC undertake passive monitoring of NO₂ across their respective areas using NO₂ diffusion tubes. SCC has a network of 247 diffusion tubes and RMBC has a network of 89 diffusion tubes. To assess the existing baseline NO₂ concentrations in the local area, the diffusion tube data for monitoring sites within 3km of the Scheme have been summarised in Table 3.5.2 below.

Table 3.5.2 RMBC non-automatic air quality monitoring NO₂ concentrations near the Scheme

Diffusion tube ID	X	Y	Site type	Annual mean NO ₂ concentration (µg/m ³)				
				2020	2021	2022	2023	2024
RDT33	441321	388461	Roadside	21.9	21.5	23.9	21.1	21.2
RDT34	441447	388267	Roadside	23.0	23.7	25.1	22.5	21.3

Diffusion tube ID	X	Y	Site type	Annual mean NO ₂ concentration (µg/m ³)				
				2020	2021	2022	2023	2024
RDT35	441695	388096	Roadside	24.9	24.7	25.3	20.8	20.7
RDT45	444375	390165	Roadside	33.8	39.3	26.5	34.8	36.5
RDT46	442681	388729	Urban background	18.3	18.7	22.3	18.1	15.5
RDT47	442587	388594	Roadside	22.7	24.6	24.4	24.8	26.5
RDT48	442491	389132	Urban background	20.7	18.9	25.2	20.6	18.0
RDT49	442617	389111	Roadside	22.8	23.5	25.0	23.0	20.1
RDT50	442623	388976	Roadside	26.4	26.5	27.4	23.7	24.1
RDT51	441961	388850	Urban background	N/a	N/a	21.6	17.6	18.1
RDT52	442866	389161	Roadside	24.5	23.3	24.5	23.2	20.6
RDT53	441765	389248	Roadside	27.9	27.3	29.3	26.7	26.1
RDT54	441988	389466	Roadside	27.9	19.4	20.0	19.4	15.6
RDT55	441283	389500	Roadside	26.9	29.1	28.4	27.7	26.5
RDT62	444476	390210	Urban background	25.1	21.4	26.5	22.9	19.0
RDT63	444470	390223	Roadside	27.5	33.1	29.6	30.8	32.3
RDT67	443764	391283	Roadside	22.1	23.7	24.4	22.7	20.8
RDT68	445192	390958	Roadside	22.1	30.1	31.0	29.0	26.2
RDT69	444565	391641	Roadside	29.8	19.5	21.6	17.9	16.4
RDT70	443969	392041	Roadside	21.4	20.5	21.0	21.1	18.4
RDT75	443334	392466	Roadside	21.9	22.5	23.4	22.5	18.9
RDT76	443495	392407	Roadside	28.7	28.5	31.5	27.7	25.9
RDT77	443579	392390	Roadside	25.0	22.5	26.6	25.6	21.4
RDT82	442393	388717	Roadside	23.6	22.0	21.1	24.6	20.6

3.5.18 The diffusion tube monitoring data presented in Table 3.5.2 shows that within 3km of the Scheme in 2024, the most recent year of data available, there were no exceedances of the Air Quality Strategy (AQS) objective for NO₂.

- 3.5.19 The highest monitored NO₂ concentration for 2024 within 3km of the Scheme was 36.5µg/m³ at RDT45, which is below the AQS objective of 40µg/m³.
- 3.5.20 As part of their automatic monitoring networks, SCC and RMBC monitor PM₁₀ and particulate matter less than 2.5 micrometres in diameter (PM_{2.5}) concentrations at several locations across their respective areas. The closest is Sheffield Tinsley (UKA00181), which is located 4.1km west of the Scheme along the M1. Sheffield Tinsley belongs to the SCC's network of automatic monitoring stations. In 2023, UKA00181 monitored an annual mean PM₁₀ concentration of 13µg/m³, and an annual mean PM_{2.5} concentration of 8µg/m³. These annual mean values for PM₁₀ and PM_{2.5} are well below the AQS objective for both the pollutants.
- 3.5.21 The proximity of UKA00181 to the M1 is very similar to the proximity of the land required to construct the Scheme to the M1, which means that UKA00181 can act as a representative monitor to consider the baseline concentrations of PM₁₀ and PM_{2.5}. UKA00181 is the most representative monitor due to its proximity to the M1 as well as its setting being in a semi-urban area, mainly used for residential purposes.
- 3.5.22 Although air quality monitoring data is available for 2020 and 2021, it is expected to have been heavily influenced by the COVID-19 pandemic where traffic flows decreased in response to restrictions including lockdowns and an increase in home working. As such, 2020 and 2021 air quality monitoring data is likely to be representative of conditions which are not considered normal.

Project-Specific Monitoring Survey

- 3.5.23 To better inform baseline conditions in the immediate vicinity of the Scheme, a six-month NO₂ diffusion tube monitoring survey was carried out from May 2024 to November 2024. The results of this survey are displayed in Table 3.5.3.
- 3.5.24 The diffusion tubes were installed at several locations to quantify NO₂ concentrations along roads likely to be used by traffic associated with the Scheme during the construction and operational phases.

Table 3.5.3 Results from NO₂ diffusion tube monitoring survey conducted in Brinsworth

Site ID	X	Y	Annualised (2024) mean NO ₂ (µg/m ³)	Data capture (%)
B1_T	443736	389978	51.6	100
B2_T	443494	389988	30.0	100
B3_T	443704	390016	19.3	100
B4	445036	389232	25.0	100
B_AW	443471	390031	28.8	100
B_BG	443893	390269	13.8	100

- 3.5.25 Due to the inherent bias associated with passive NO₂ diffusion tubes, it was necessary to determine a bias adjustment factor which was applied to the raw diffusion tube results. The relevant national bias adjustment correction factor for the

laboratory and preparation method associated with the diffusion tubes (Staffordshire Highways Laboratory – 20% triethylamine in water) was 0.80, suggesting that the raw data overestimated NO₂ concentrations.

- 3.5.26 In order to be used as an annual mean, the six-month bias-adjusted concentrations data needed to be annualised in order to be representative of 2024 annual mean concentrations. This was undertaken following the guidance detailed in Box 7-9 of Local Air Quality Management – Technical Guidance (TG22) (Department for Environment, Food and Rural Affairs (Defra), 2025), and the annualisation factor was calculated to be 1.20.
- 3.5.27 Table 3.5.3 above shows that for all monitoring sites, with the exception of B1_T, monitored NO₂ concentrations are well below the AQS objective for NO₂. Monitoring site B1_T recorded an annual mean NO₂ concentration of 51.6µg/m³, which exceeds the AQS objective for annual mean NO₂ (40µg/m³). This concentration is attributable to its roadside location near a high wall on the steep section of the A631, adjacent to the uphill carriageway, and is unlikely to be representative of the exposure at the residential properties north of this site which are further away from the roadside, and further up the hill.

Background Pollutant Concentrations

- 3.5.28 Modelled predictions of background pollutant concentrations are periodically produced by Defra to assist local authorities in their review and assessment of air quality. These are produced for every 1km Ordnance Survey (OS) grid square in the UK.
- 3.5.29 The land required to construct the Scheme is located at grid square 444500, 390500. Data for this grid square was downloaded from the Defra website (Defra, 2026) Background Maps for the purposes of the assessment. Table 3.5.4 shows the background pollutant concentrations for the base year 2026. All concentrations are well below their respective objectives (which are detailed in Appendix B, Methodology).

Table 3.5.4 Defra 2024 background pollutant concentrations at the Scheme

Pollutant	Concentration (µg/m ³)
NO ₂	11.3
PM ₁₀	12.3
PM _{2.5}	6.9

Statutory Ecological Sites

- 3.5.30 There are five statutory ecological sites located within 3km of the Scheme:
- Whiston Meadows LWS is within the land required to construct the Scheme;
 - Burnt Wood LWS, an ancient woodland, is located adjacent south west of the land required to construct the Scheme;
 - Old Flatts Farm Marsh LWS is located approximately 10m south west of the land required to construct the Scheme;

- Canklow Wood LWS, an ancient woodland site, is located 20m north west of the land required to construct the Scheme. This ancient woodland is displayed in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.2.1 located earlier in this chapter, as one of the project-specific monitoring diffusion tubes was installed on the border of the ancient woodland; and
- Catcliffe Flash LNR is located approximately 760m south west of the land required to construct the Scheme.

Potential Construction Impacts

Construction Dust

- 3.5.31 This appraisal considers the potential impacts of the Scheme during construction on local air quality. During the construction phase of the Scheme, there is a potential for dust to be emitted into the air through construction activities (demolition, earthworks, construction) and from plant and road vehicles moving over temporary roads and open ground, and where mud is carried from construction vehicles onto the highway (known as ‘trackout’). Airborne dust has the potential to cause a nuisance to local human receptors due to dust soiling, and it can affect local ecological sites that are sensitive to dust impacts.
- 3.5.32 A construction dust risk assessment has been carried out due to the presence of sensitive receptors within 250m of the land required to construct Scheme. The assessment was carried out in accordance with the IAQM Guidance on the assessment of dust from demolition and construction (IAQM, 2024). The assessment’s purpose is to define the level of unmitigated construction dust risk as a means of defining proportionate control measures. The dust risk assessment is considered to be conservative as the screening distances are from the edge of the land required to construct the Scheme, with the assumption that dust emissions could take place across the entirety of the land required to construct the Scheme.
- 3.5.33 Table 3.5.5 below shows the potential unmitigated risks from the construction of the Scheme for dust soiling, human health impacts and ecological receptors. There is a medium risk of dust soiling and impacts on ecological sites, and a low risk of impacts on human health.
- 3.5.34 The level of activity-specific mitigation for each of the four construction activities is chosen using a precautionary approach in those instances where the risk level is not uniform between dust soiling, human health and ecological receptors, therefore medium risk mitigation measures are required.

Table 3.5.5 Unmitigated risk of dust impacts from construction activities associated with the Scheme

	Risk by construction activity			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Medium
Human Health	Low	Low	Low	Low
Ecological	Medium	Medium	Medium	Medium

	Risk by construction activity			
	Demolition	Earthworks	Construction	Trackout
Level of activity – specific mitigation measures	Medium	Medium	Medium	Medium

3.5.35 The mitigation measures identified in Table 3.5.6 will reduce the potential impacts from the construction activities and will result in all dust generating activities being negligible during the construction phase.

3.5.36 The full methodology and detailed results for the construction dust risk assessment are provided in Appendix G, Construction Dust Assessment and Methodology.

Construction Traffic

3.5.37 The construction traffic flows associated with the Scheme were screened against the traffic change thresholds in the IAQM (2017) Development Control guidance for human receptors and National Highways (2024) Design Manual for Roads and Bridges (DMRB) LA 105 for ecological receptors (sites with a relevant ecological designation such as Site of Special Scientific Interest (SSSI), SAC, SPA, Ramsar and ancient woodland).

3.5.38 The IAQM guidance presents two sets of flows change criteria: one for use in areas proximal to/within AQMAs, and a less stringent set for use in other locations away from AQMAs. As the Scheme is located within a recently revoked AQMA, and within 2km of a second AQMA, the more stringent criteria have been used.

3.5.39 This screening criteria is a change of LDV flows of more than 100 AADT and/or a change of HDV flows of more than 25 AADT. During the entire construction phase for the Scheme, traffic flows are forecasted to not exceed the IAQM screening criteria for both LDVs and HDVs. From 2027 to 2030, the largest change in traffic flows for LDVs and HDVs would occur in 2028, with an increase in flows of 14 AADT and 3 AADT respectively. These changes in flows are both well below the IAQM screening criteria. Therefore, an assessment of the effect of these traffic flows on human receptors was screened out.

3.5.40 There is the potential for the construction programmes of the Scheme and the proposed new 400kV Long Lane Substation to overlap. The cumulative traffic flows from both construction programmes could potentially exceed the IAQM screening criteria and trigger an air quality assessment.

3.5.41 During the entire construction period for the two schemes, cumulative traffic flows are forecasted to exceed the IAQM screening criteria for both LDVs and HDVs in two separate years of construction. There is predicted to be an increase in flows of 104 AADT for LDVs during 2028 and a flow increase of 26 AADT for HDVs in 2027. The cumulative traffic flows from the construction of both schemes therefore exceed the IAQM screening criteria and trigger the need for an air quality assessment. In order to demonstrate a worst-case scenario in regard to construction traffic flows, the two peak cumulative construction traffic flows for LDVs and HDVs were combined into a single year and modelled using worst case per vehicle emissions from 2024.

- 3.5.42 It was found that the magnitude of impact of the construction vehicles associated with both the Scheme and the new 400kV Long Lane Substation are negligible for NO2, PM10 and PM2.5.
- 3.5.43 The cumulative flows did not meet the change criteria in National Highways (2024) DMRB LA 105 (>1000 AADT, and/or >200 HDVs), and as such the effect of construction vehicle exhaust emissions on ecological receptors was screened out.

Potential Operational Impacts

- 3.5.44 During normal operation of the Scheme, it is understood that the only traffic generated would be associated with infrequent repair and routine maintenance and inspection activities and a small number of operational staff (assumption of less than 10 vehicles per year). This number of vehicle movements is well below the screening thresholds; therefore an operational phase air quality assessment is scoped out.

Construction Control Measures

- 3.5.45 The control measures listed in Table 3.5.6 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP and their implementation will be monitored by National Grid.
- 3.5.46 These measures were calculated by undertaking a construction phase dust risk assessment in accordance with the IAQM (2024) construction dust guidance. This assessment utilises construction information, number and distances of receptors (those within 250m of the land required to construct the Scheme, and/or those within 50m of the haul routes up to a distance of 250m from the site entrances), and existing dust concentrations in order to calculate unmitigated dust risk for construction, earthworks, and trackout. The dust risk (small/medium/large) is then used to define which control and management measures should be adopted to avoid residual effects.
- 3.5.47 The mitigation measures commensurate with the calculated risks, as detailed in this chapter, are listed in Table 3.5.6. These measures are further detailed within Appendix G, Construction Dust Assessment and Methodology of this EAR.

Table 3.5.6 Construction control and monitoring measures for Air Quality

Potential receptor and/or impact	Control, enhancement and monitoring measures
Dust emissions from the excavation of materials, general construction activities and the movement of Heavy Goods Vehicles (HGVs) (trackout) on sensitive residential and human receptors.	<p>A Dust Management Plan will be produced by the Contractor which will include, but not be limited to, the following:</p> <ul style="list-style-type: none"> Site management – Record all dust and air quality complaints, make the complaints log available to the local authority when asked and record any exceptional incidents. Preparing and maintaining the site – Erect barriers, enclose site operations, keep haul roads and equipment damped down, avoid site runoff, remove materials with a potential to produce dust.

Potential receptor and/or impact	Control, enhancement and monitoring measures
	<ul style="list-style-type: none"> Operating vehicle/machinery and sustainable travel – Ensure Non-Road Mobile Machinery complies with best practice standards, i.e. no idling, speed limits, implement travel plan, avoid diesel generators. Operations – only use cutting/grinding equipment in conjunction with dust suppression, use enclosed chutes, minimise drop heights, ensure adequate water supply on-site and ensure equipment is available on-site to clean dry spillages. Waste management – Recycle and re-use waste materials, avoid bonfires and burning of waste. Measures specific to demolition – ensure effective water suppression is used during demolition operations, avoid explosive blasting and bag and remove biological debris. Measures specific to earthworks – re-vegetate earthworks and exposed areas, use Hessian, mulches or tackifiers where re-vegetation is not possible; Measures specific to construction – avoid scabbling, ensure sand and aggregates are stored in bunded areas and are kept damp where possible. Measures specific to trackout – use a water-equipped road sweeper on access/local roads, avoid dry sweeping of large areas, ensure vehicles are covered, record inspections of haul routes and actions, install hard surface haul routes which are regularly damped down, implement wheel washing systems, apply dust suppressants to locations where large volume of vehicles enter/leave site, site access gates at least 10m from receptors.

Operational Control Measures

3.5.48 There are no operational control measures required.

3.6 Water Resources and Flood Risk

Introduction

- 3.6.1 This section details the Water Resources and Flood Risk baseline conditions and the environmental appraisal of the potential Water Resources and Flood Risk impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.6.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; and Appendix D, Long Lane New Overhead Lines Drawings.

Study Area

- 3.6.3 The land required to construct the Scheme for the Water Resources and Flood Risk appraisal comprises the area within the land required to construct the Scheme, plus a 250m buffer on all sides. This is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.6.1.

Consultation

- 3.6.4 Table 3.6.1 provides a summary of the issues raised and agreed during consultation with respect to Water Resources and Flood Risk and how they have been addressed.

Table 3.6.1 Summary of consultation

Consultee/date	Summary of issues raised/agreed
Environment Agency (April to July 2026)	Due to parts of the Scheme being located within a flood storage area, a Flood Risk Activity Permit will be required to facilitate the works.
Environment Agency (June 2026)	No issues raised in response to the Form B consultation.
RMBC (August 2023)	No issues were raised.
Yorkshire Water (August 2023)	No issues were raised.

Baseline

Water Bodies

- 3.6.5 Two Environment Agency Main Rivers are present within the land required to construct the Scheme: the Whiston Brook to the north, which flows in a north east to south west direction; and the River Rother to the west, which flows from south west to north west.
- 3.6.6 There is also an ordinary watercourse located within the land required to construct the Scheme, the Ulley Brook. This watercourse forms part of the Canklow Washlands, a strategic flood risk management asset operated by the Environment Agency, where floodwaters can be stored in a controlled manner, to reduce flood risk to downstream centres of population.
- 3.6.7 There are several drainage ditches within the land required to construct the Scheme. One flows from the south west to the east, another is associated with Long Lane road, and the rest are located in the Canklow Washlands. An overview of the water features in the study area is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.6.1.

Water Quality

- 3.6.8 The study area drains to two Water Framework Directive (WFD) surface water body catchments, namely the Rother, Doe Lea to Don; and Ulley Brook from Source to River Rother (Environment Agency, 2023). Table 3.6.2 below details the current

status and lists the Reasons for Not Achieving Good (RNAG) overall status for these water bodies.

Table 3.6.2 WFD surface water bodies within study area

Name	ID	Ecological status	Chemical status	Overall status	RNAG
Rother, Doe Lea to Don	GB104027057772	Moderate	Does not require assessment (fail in 2019)	Moderate	Flood protection, poor nutrient management, sewage discharge, urbanisation and others unknown but pending investigation
Ulley Brook from Source to River Rother	GB104027057740	Good	Does not require assessment (fail in 2019)	Good	Barriers – ecological discontinuity, poor soil management, transport drainage, others unknown but pending investigation

3.6.9 There is one WFD groundwater body which underlies the Scheme, data for which is summarised below in Table 3.6.3.

Table 3.6.3 WFD groundwater bodies

Name	ID	Quantitative status	Chemical status	Overall status	RNAG
Don & Rother Millstone grit & Coal Measures Water Body	GB40402G992300	Good	Poor	Poor	Abandoned mines, natural mineralisation, others unknown but pending investigation

Water Resources

- 3.6.10 The British Geological Survey (BGS) Geology Viewer (BGS, 2025) shows that the land required to construct the Scheme is underlain predominantly with ‘Mexborough Rock - Sandstone. Sedimentary bedrock formed during the Carboniferous period’. The Pennine Middle Coal Measures Formation (mudstone, siltstone, sandstone) is present to the south west of the land required to construct the Scheme. There are limited superficial deposits (gravel, sand, silt, clay) in the western and south western part of the land required to construct the Scheme, aligned with Ulley Brook.
- 3.6.11 The land required to construct the Scheme is underlain by a Secondary A aquifer, which is comprised of permeable rock layers that can support local water supplies and form important sources of base flow to rivers.

Flood Risk

- 3.6.12 The western part of the land required to construct the Scheme lies within Flood Zone 2 (land defined as having an annual chance of river flooding from rivers of between 0.1% and 1%) and Flood Zone 3 (land defined as having an annual chance of river flooding greater than 1% (1 in 100)), as illustrated in Figure 3.6.2 Baseline Fluvial Flood Risk. The eastern and southern parts of the land required to construct the Scheme lie within Flood Zone 1, defined as having a low probability of flooding from rivers and the sea, with an annual chance of flooding of less than 0.1% (1 in 1,000).
- 3.6.13 The land required to construct the Scheme is generally at a very low risk of flooding from surface water (defined as land with a less than 0.1% annual chance of flooding). There are areas of the land required to construct the Scheme which are at 'medium' and 'high' risk of flooding, particularly in the central and northern parts. These areas are associated with localised topographical depressions, notably in the Canklow Washlands and along the Ulley Brook river valley. The land required to construct the Scheme is not currently formally drained. Overland flow partially drains towards a small depression that runs through the south west corner of the land required to construct the Scheme and runoff is governed by the infiltration capacity of underlying soils and geology and the local topography.
- 3.6.14 The land required to construct the Scheme is considered to be at medium risk of groundwater flooding. However, the land required to construct the Scheme is not considered to be vulnerable to groundwater flooding and therefore this is not considered a constraint.
- 3.6.15 The land required to construct the Scheme is at low risk of flooding from all other sources.
- 3.6.16 Details of the flood risk are further included within the Appendix K, Flood Risk Assessment, which concludes a generally low risk of flooding to the Scheme from these sources, with the exception of groundwater (medium risk). Mitigation measures are detailed in the FRA to manage runoff from surface water sources during construction.

Potential Construction Impacts

- 3.6.17 The following potential impacts have been identified during the construction phase, based on the source-pathway-receptor principle.
- 3.6.18 Surface water runoff generated during construction could transport debris, silt, or pollutants from the site into nearby drains and water receptors, potentially degrading water quality. This risk will be managed through the pollution prevention and drainage measures set out in a CEMP, ensuring that contaminated water is not discharged to surface water receptors. In the event of a spillage and pollution incident, a response plan will be in place prior to construction that will define protocols to prevent detriment to the water environment.
- 3.6.19 The hydromorphology of nearby watercourses, including Whiston Brook, River Rother, and Ulley Brook, could be affected by excess silt entering channels. Sediment build-up in channel or scour of the channel profile from uncontrolled discharges could alter channel profiles and flow patterns. Mitigation measures are outlined in Table 3.6.4.

- 3.6.20 With regard to the water resource/supply attributes of surface waterbodies, a non-depletive approach is proposed. Mitigation measures are outlined in Table 3.6.4 below.
- 3.6.21 As per the Mining Remediation Authority Map Viewer (Mining Remediation Authority, 2025) there are potentially historical mines in the study area, which may influence the local hydrological regime. The potential for impacts can be managed via preconstruction measures to investigate groundwater levels and confirm presence of any mining legacy features within the land required to construct the Scheme. Alongside this, during construction, a monitoring programme and contingency plans would be implemented to reduce the risks.
- 3.6.22 Considering the control, enhancement and monitoring measures in Table 3.6.4, the land required to construct the Scheme is considered to have a low to negligible impact overall on water environment receptors during construction.

Potential Operational Impacts

- 3.6.23 Due to the nature of the land required to construct the Scheme, the expected increase in impermeable land cover during operation is minimal. Hence it is not expected that there will be any consequent change to the local land drainage regime nor any increase surface water flooding or flooding from any other sources.
- 3.6.24 During operation, the land required to construct the Scheme would not generate any runoff to the water environment that is likely to be contaminated or laden with silt. It is therefore not expected that the water quality of the surrounding environment will be impacted.

Construction Control Measures

- 3.6.25 The control measures listed in Table 3.6.4 will be applied during the construction phase of the land required to construct the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the land required to construct the Scheme. The control measures will be included in the CEMP and their implementation will be monitored by National Grid.

Table 3.6.4 Construction control and monitoring measures for Water Resource and Flood Risk

Potential receptor and/or impact	Control, enhancement and monitoring measures
Watercourses (e.g. Whiston Brook, River Rother, Ulley Brook), water bodies and aquifers – degradation of water quality	The Contractor will prepare detailed method statements, as part of the CEMP, and implement appropriate controls to safeguard the water environment and manage surface water runoff from the construction footprint, taking account of the overland flow path identified through the eastern section of the land required to construct the Scheme and the Scheme's underlying Mexborough Rock Sandstone aquifer. Controls will include best practice pollution prevention measures for activities such as earthworks, excavation, dewatering, fuel and chemical storage, vehicle washing, and emergency contingency actions.

Potential receptor and/or impact	Control, enhancement and monitoring measures
	<p>Construction machinery will be refuelled within bunded areas with sealed drainage systems, located away from the overland flow route and any drainage features. Wastewater generated from the construction areas would be disposed of via appropriate means, either via foul sewer connection (where available) or by tanker removal.</p> <p>An Environmental Emergency Response Plan will document protocols to be implemented to prevent pollutants infiltrating the soils beneath the site and reaching surface water or shallow groundwater receptors. Appropriate equipment (e.g. absorbent mats and booms) would also be made easily accessible on site to deal with accidental spillages, and the plan would provide a full list of protocols and communication channels with the Environment Agency in the event of an incident. All site staff would be trained via toolbox talk training on these procedures.</p> <p>Materials will be stored in accordance with best practice in construction areas, avoiding storage in close proximity to any watercourse or drain, to prevent pollution of the surface water environment. Any dewatering of excavations would be done in accordance with relevant permits (where applicable), and discharges would be made to ground, following suitable treatment where necessary. The above controls safeguarding water quality would also protect the integrity of any existing surface water abstractions and discharges.</p>
Surface and groundwater resources – consumptive water use	Measures will be implemented to promote general water use efficiency during construction and particularly to reduce the use of potable water, for example recirculating wheel washers and water efficient welfare facilities.
Watercourses (e.g. Whiston Brook, River Rother, Ulley Brook) – impacts on hydromorphology (physical form, flow and sediment transport regimes)	<p>Soil will be stored away from watercourses.</p> <p>Any permitted discharges to watercourses or drains during the construction will be attenuated to ensure scour risk is minimised and treated where applicable to prevent sedimentation.</p>
Proposed development – increase in flood risk	Measures will be set out in the CEMP to manage surface water runoff during construction of the Scheme, and the construction work sites within Flood Zone 3 would be managed in accordance with flood emergency protocols and procedures (informed by Environment Agency flood warnings), in the unlikely event of flooding from the River Rother, Ulley Brook or Whiston Brook.
Floodplains and land drainage – increase in flood risk or impeded drainage	<p>Existing land drainage routes/key flow paths would be retained.</p> <p>As part of pre-construction works, a record of existing land drainage would be compiled and, subject to landowner/occupier agreement, new drains would be established to help prevent damage to soil structure, maintain work areas in a dry condition and to enable</p>

Potential receptor and/or impact	Control, enhancement and monitoring measures
	<p>current drainage systems to continue to operate through the construction phase.</p> <p>Any topsoil and/or excavated material will be reinstated to ensure no detriment to the existing land drainage regime.</p>
Degradation of groundwater body (Don & Rother Millstone grit & Coal Measures Water Body) quality	<p>An Environmental Emergency Response Plan will document measures to be implemented to prevent pollutants infiltrating into the soils beneath the site and reaching the groundwater receptors. Appropriate equipment (e.g. absorption mats) would also be made easily accessible on site to deal with accidental spillages, and the plan would provide a full list of protocols and communication channels with the Environment Agency in the event of an accidental groundwater pollution incident.</p> <p>Materials would be stored in accordance with best practice in construction areas, to prevent pollution of the groundwater environment.</p>
Water resources – water efficiency	<p>Water efficiency measures would be implemented during construction to minimise demand for main water. Measures would include such as the use of recycled water wheel washing and low-use fittings within welfare facilities, and regular inspection and maintenance of equipment to prevent leaks and unnecessary water use.</p>

Operational Control Measures

- 3.6.26 No drainage works are proposed to serve the operational development. Part of the operational development will be situated in Flood Zone 2/3, however the new overhead lines will connect to existing pylons and so are not expected to increase flood risk.
- 3.6.27 Based on the above, no control or monitoring measures are required for the operational Scheme.

3.7 Land and Ground Conditions

Introduction

- 3.7.1 This section details the Land and Ground Conditions baseline conditions and the environmental appraisal of the potential Land and Ground Conditions impacts associated with the construction and operation of the land required to construct the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.7.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; and Appendix D, Long Lane New Overhead Lines Drawings, Figures 3.7.1, 3.7.2 and 3.7.3.

Study Area

- 3.7.3 The study area for the Land and Ground Conditions appraisal, as seen in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.7.1, comprises the land required to construct the Scheme, plus a 250m buffer on all sides. For ground conditions, the study area reflects the surrounding geological environment and considers the distance over which significant effects can reasonably be thought to have the potential to occur. For contamination, the study area is considered appropriate as this is the distance over which potentially contaminative sites could cause greater impacts on the land required to construct the Scheme, e.g. migration of gases from a landfill site, migration of contamination in the air, within groundwater, or surface water.

Consultation

- 3.7.4 Consultation was undertaken with RMBC in 2024 for the separate substation development and the “tie in” works were included within this. A summary of the consultation is presented in the Table 3.7.1 below.

Table 3.7.1 Summary of consultation

Consultee/date	Summary of issues raised/agreed
13/07/2024 RMBC (Environmental Protection Officer)	<p>No comments or further suggestions were provided by the Environmental Protection Officer on the proposed layout and content of the Land and Ground Conditions appraisal. However, the following information relevant to the land required to construct the Scheme was provided:</p> <ul style="list-style-type: none"> • Contamination/spills – no records relating to contamination or past contaminative land uses, spills or illegal tipping. • Landfill sites – No landfill site records within 500m relating to planning permission. • Mining – almost the whole of Rotherham has been mined and therefore areas may be affected by subsidence or mines gas migration and further investigation may be required. • No sites are currently designated as contaminated land under Part IIA of the Environmental Protection Act 1990. • No storage of hazardous materials being stored at the enquiry site. • There are records for one petrol filling station, which is located 161m north east of the land required to construct the Scheme. • Previous land uses – the land is agricultural fields dating from 1888. • Two old quarries are annotated on historical maps from circa 1888 until 1916 – 1922/1928. One quarry is located on/adjacent to the top north west corner of the land required to construct the Scheme and the other is located on/adjacent to the top north east corner of the land required to construct the Scheme. • A sewage treatment works has also occupied land to the north of the land required to construct the Scheme from circa 1888 until 1967.
07/08/24 Environment Agency	The Environment Agency Planning Specialist (Yorkshire) provided a pre-planning application guidance note was provided with general advice for the planning process.

Consultee/date	Summary of issues raised/agreed
Planning Specialist (Yorkshire)	<p>A basic environmental check was also undertaken by Environment Agency detailing the following information which relates to the land required to construct the Scheme and a wider temporary works area:</p> <ul style="list-style-type: none"> • It is within Flood Zone 2 and 3 and its noted that the development proposal would likely be assessed as 'essential infrastructure'. • It is located above an aquifer (bedrock) classified as Secondary A. • It is located in close proximity to an aquifer (superficial) classified as Secondary (undifferentiated). • It displays groundwater vulnerability issues classified as high. • It may present a need to demonstrate compliance with the Water Framework Directive (WFD). • It is located in proximity to records of high priority protected species.

Baseline

Site and Study Area Description

- 3.7.5 The land required to construct the Scheme is located crossing the M1 and Long Lane north to south, is irregular in shape and will comprise the extent of new overhead lines and the associated areas of access and construction. The land required to construct the Scheme is predominantly undeveloped, primarily used as agricultural fields. The western extent of the land required to construct the Scheme crosses over Rotherway Road (A630).
- 3.7.6 The study area is defined as the land required to construct the Scheme plus a 250m buffer around it. It is predominantly undeveloped, comprising agricultural fields to the east, south and west. Further to the west over Long Lane is a marshy area with reed beds (approximately 30m) with a gas main noted to be running along Long Lane. To the north is a wooded area of public open space with Whiston Brook flowing through east to west. Whiston lies approximately 100m to the north east. The A618 is present approximately 125m east of the land required to construct the Scheme with further fields beyond. On the walkover, fly tipping was observed within the M1 underpass.

Geology

- 3.7.7 **Made Ground:** Made Ground is mapped in several areas of the land required to construct the Scheme associated with construction of the M1 and the A630 and directly north associated with an infilled quarry. There are also several mapped areas of infilled ground directly north west of the land required to construct the Scheme (infilled sandstone quarry) and approximately 75m to the east (historic open coal workings). A large area of opencast coal workings is also mapped directly west and is labelled as infilled ground.
- 3.7.8 **Superficial geology:** Alluvium, described as clay, silt, sand and gravel, is mapped in the west of the land required to construct the Scheme. Head deposits are also mapped approximately 40m to the north of the land required to construct the Scheme. The local superficial deposits are presented in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.7.2.

- 3.7.9 **Bedrock geology:** The majority of the land required to construct the Scheme is underlain by Mexborough Rock – Sandstone, described by the BGS (2026) as ‘stratified sandstone bedrock of Bolsovian sub-age’, shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.7.3. The Pennine Middle Coal Measures Formation of mudstone, siltstone and sandstone (which are of Bolsovian to Duckmantian in age) are mapped in the south west and north east and the Ackworth Rock– Sandstone is mapped in the north east.
- 3.7.10 Inferred faults are mapped on-site in the south west and the east of the land required to construct the Scheme. Coal seams and marine fossil horizons are mapped approximately 20m north east and marine fossil horizons and coal seams are mapped in the south west (BGS, 2026).
- 3.7.11 No geological sites (regional or local) or other sensitive designation with respect to geology are recorded within the study area (Groundsure, 2024). There are no records to indicate that the land required to construct the Scheme is located within a Regionally Important Geological and Geomorphological Site.
- 3.7.12 The GeoIndex Viewer (BGS, 2026) indicates that there are boreholes located directly on-site, associated with the construction of the M1. Selected boreholes are summarised below in Table 3.7.2 and depths are presented as metres below ground level (bgl).

Table 3.7.2 Selected BGS borehole records

Borehole ID	Location from Site	Geology	Depth to base (m bgl)	Groundwater strike depth (m bgl)
SK48NW765	Approximately 10m west	Made Ground – sand or gravel of sandstone, limestone clinker and coal.	>2.15	Not recorded
SK48NW764	Approximately 10m west	Made Ground – gravelly sand or gravelly clay. Gravel of clinker, slag, limestone, sandstone, siltstone and coal.	6.40	Not recorded
		Extremely weak sandstone.	>7.78	
SK48NW783	Adjacent east	Made Ground – variable layers of gravel, sand, silt and clay. Gravel of mudstone, siltstone, sandstone, limestone and occasional cinder.	6.70	4
		Sandy gravelly clay with gravel of siltstone and sandstone.	10.20	
		Gravelly very clayey sand. Gravel is sandstone.	13.50	
		Sandstone bedrock.	>19.00	
SK48NW757		Made Ground – variable layers of clay, gravels and sand.	7.20	Not recorded

Borehole ID	Location from Site	Geology	Depth to base (m bgl)	Groundwater strike depth (m bgl)
	Approximately 30m east	Occasional brick and limestone fragments.		
		Soft brown clay with much fine to coarse sandstone gravel.	8.50	
		Greyish brown thinly bedded siltstone. Thin beds of coal.	15.50	
		Reddish brown slightly weathered sandstone.	>19.70	
		Weathered mudstone becoming very stiff mudstone.	2.60	
		Argillaceous sandstone.	>2.70	

Geology (Encountered)

- 3.7.13 A ground investigation was undertaken in relation to the new 400kV Long Lane Substation site and surrounding land between 17 September and 18 October 2024. This was undertaken by Winshall Ltd with Jacobs Ltd as designers and producers of the Ground Investigation Report (GIR), Ref: B2441B05-JAC-BR-XX-RP-C-02106, dated February 2025 (Jacobs, 2025). The following exploratory holes were undertaken within the vicinity of land required to construct the Scheme: four hand-dug trial pits (TP), five machine-excavated trial pits and six boreholes (BH) comprising dynamic sampling/rotary follow on.
- 3.7.14 The general conditions encountered comprised a thin layer of organic topsoil and weathered Mexborough Rock (predominantly recorded as medium dense red brown gravel) over intact Mexborough Rock (extremely weak to medium strong thinly bedded red brown sandstone. Within TP4 between 1.7–2m bgl and in BH1 between 0.95–2m bgl, cohesive deposits were encountered which were interpreted as Pennine Coal Measure overlying the Mexborough Rock, by Jacobs. A summary of recorded depths by Jacobs are presented in Table 3.7.3 below.

Table 3.7.3 Summary of recorded strata depths

Strata	Min. top depth (m bgl)	Max. top depth (m bgl)	Thickness range (m)
Topsoil	0.00	0.00	0.25–0.40
Weathered Mexborough Rock	0.25	0.40	0.25–2.02
Mexborough Rock	0.55	2.32	0.35–14.95*
Weathered Pennine Coal Measures	0.25	0.25	5.35
Pennine Middle Coal Measures	5.60	5.60	29.40*

*Base of geological unit not encountered

Hydrogeology

- 3.7.15 The desk study and the Multi-Agency Geographic Information for the Countryside (MAGIC) maps database (Defra, 2026) indicate that the underlying bedrock geology and superficial alluvium is classified as a Secondary A aquifer. Secondary A aquifers are defined as '*permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers*' (Groundsure, 2024). These are generally aquifers formerly classified as minor aquifers.
- 3.7.16 The superficial head deposits to the north are designated as a Secondary Undifferentiated aquifer.
- 3.7.17 The groundwater vulnerability classification is designated as medium to high for the bedrock aquifer (Groundsure, 2024). The desk study (Arcadis, 2025) also states that the land required to construct the Scheme is not within a Source Protection Zone. The superficial alluvium and nearby head are both designated as high vulnerability.
- 3.7.18 The search conducted by RMBC in 2024 found no records of private water supplies located on-site and no records of groundwater abstractions located on-site, or within the 250m study area.
- 3.7.19 Groundwater monitoring was undertaken on the three boreholes drilled in 2024 as detailed in the Jacobs GIR. The GIR indicates that groundwater underlying the land required to construct the Scheme is generally between 2–4m bgl, however this was undertaken in winter so allowance for seasonal variation should be considered. The groundwater ranges are presented below in Table 3.7.4 for drilling and post field monitoring.

Table 3.7.4 Groundwater level readings from post-field work monitoring and drilling

Borehole ID	Depth (m bgl)	Date	Activity
BH1	6.20 – 8.10	14 October 2024 – 15 October 2024	Drilling
BH1	1.59 – 3.92	18 November 2024 – 6 January 2025	Post-fieldwork monitoring
BH2	2.50 – 4.60	7 October 2024 – 8 October 2024	Drilling
BH3	Dry	1 October 2024 – 10 October 2024	Drilling
BH4	Dry – 13.00	24 September 2024 – 22 October 2024	Drilling
BH4	1.68 – 3.85	5 December 2024 – 7 January 2025	post-fieldwork monitoring
BH6	0.25 – 3.28	17 September 2025 – 25 September 2025	Drilling
BH6	1.40 – 3.50	11 October 2024 – 7 January 2025	Post-fieldwork monitoring

Hydrology

- 3.7.20 According to the Groundsure Report (Groundsure, 2024), there are 35 surface water features within 250m of the land required to construct the Scheme. The identified water features on Site are Ulley Brook, River Rother and Whiston Brook and unnamed channels and streams which are culverted/channelled in places. Ecology surveys have confirmed the presence of several ponds within the study area, and the Canklow Washlands, a ponded/marshy area, is located approximately 30m west of the land required to construct the Scheme.

Unexploded Ordnance

- 3.7.21 The Unexploded Ordnance risk maps (Zetica, 2026) indicate the land required to construct the Scheme is located within an area of low risk, '*indicated as having less than 15 bombs per 1000 acres or less*'. The Preliminary Desk Study Assessment for the land required to construct the Scheme concluded that '*a detailed desk study, whilst always prudent, is not considered essential in this instance*'.

Radon

- 3.7.22 According to the UK Radon Risk Map (UK Health Security Agency, 2024), the land required to construct the Scheme is in an area where <1% of properties are estimated to be above the radon action level. As such, it is unlikely that new development or structures within the land required to construct the Scheme will require radon protection measures.

Historic Review

- 3.7.23 Following a review of the OS maps of the local area, found in the Groundsure (2024) report, salient points are detailed below.
- 3.7.24 The land required to construct the Scheme has remained largely unchanged from the earliest map (1855) as agricultural/undeveloped land (labelled as liable to flooding and marshy) with roads and watercourses until the construction of the M1 by 1979 (centre running east–west) and the existing Brinsworth Substation with overheads lines spanning across the land required to construct the Scheme. Other features noted include Haworth Hall that was demolished as part of the M1, a quarry (1855–1891) in north west (bordering the northern boundary) and an opencast coal workings mapped in the southwest (1940s). To the north and north east is the village of Whiston which is part of the wider built-up area of Rotherham. An industrial estate is present approximately 300–350m north east, however the surrounding land is mainly agricultural fields to the west, south and east.

Environmental Information

- 3.7.25 **Landfills and waste:** No active landfills and no waste sites are recorded within the land required to construct the Scheme. A waste exemption for storing sludge (non-agricultural waste) is present on-site in the north at Spa Farm Spa Houses.
- 3.7.26 There are two historic landfill sites recorded within the study area by the RMBC and the Environment Agency:
- Brinsworth Switching Station immediately adjacent to the northwest boundary. No further information listed;

- Canklow Tip approximately 196m west was licensed to receive industrial waste. First recorded in 1952. No further information listed.

3.7.27 **Current industrial land use:** The 2026b Groundsure report indicates the only industrial land uses currently on-site are the pylons associated with existing overhead lines and the existing Brinsworth Substation in the west. The other currently industrial land uses indicated to be within the study area are:

- electricity substations, located approximately 75m north and 130m east of the land required to construct the Scheme;
- “Bike Box Alan” (manufacturer of bike boxes), located approximately 30m north east of the land required to construct the Scheme; and
- gas valve compound, located approximately 80m north of the land required to construct the Scheme.

3.7.28 **Pollution incidents:** No sites have been determined as contaminated land within the study by RMBC. However, the 2026b Groundsure report indicates that there are 17 pollution incidents recorded within the Environment Agency database within the study area. They predominantly relate to fuel or sewage spills to the north of the land required to construct the Scheme. The closest incident was a diesel spill from 2002, located approximately 10m north of the land required to construct the Scheme, which had only minor impact to water and land. The closest recorded ‘significant impact’ which relates to water, from a crude sewage spill in 2003, is not likely to affect the land required to construct the Scheme owing to age and nature.

3.7.29 **Environmental designations:** The 2026a Groundsure report, indicates the land on-site is designated as Green Belt. The land required to construct the Scheme is not within an SSSI or an SSSI impact risk zone. No other environmental designations are recorded within the study area.

Mining, Quarries and Minerals

3.7.30 The Consultants Coal Mining Report Ref. 51003373983001 (The Coal Authority (now Mining Remediation Authority), 2023) relates to land around the Scheme but is not exact. Therefore, distances have been approximated from the land required to construct the Scheme. A summary of the report is presented below:

- No mine entries are recorded within 100m of the land required to construct the Scheme;
- No probable unrecorded shallow workings;
- No recorded incidents of mine gas within 500m of the land required to construct the Scheme;
- No mine water treatment schemes are recorded within 500m of land required to construct the Scheme;
- There are three outcrops of the Brecks coal seam within the land required to construct the Scheme (0.4–0.6m thick);
- There are two outcrops of the Shafton coal seam within the land required to construct the Scheme (0.7m thick) and one outcrop 8.1m north of the land required to construct the Scheme;

- The shallowest coal seam below the land required to construct the Scheme is Wath Wood at 314m bgl;
- Two records of unlicensed opencast coal mining are recorded in the land required to construct the Scheme: one in the south west and one in the north east; and
- The High Hazel seam is located south west of the land required to construct the Scheme at 285m bgl.

3.7.31 The South Yorkshire Mineral Resources Map (BGS, 2006) indicates that the land required to construct the Scheme is within an area of shallow coal, and Policy CS 26 of the Rotherham Local Plan (RMBC, 2018) states that mineral safeguarding areas will be defined around all deposits of coal that are considered to be of current or future economic importance. Therefore, the land required to construct the Scheme would fall within a potential mineral safeguarding area. However, as no coal seams or other potential mineral resources are mapped within the land required to construct the Scheme, it is not likely that the Scheme would sterilise coal or other potential mineral resources that are economically viable to extract.

Contamination

3.7.32 As part of the Jacobs ground investigation, 22 natural soil samples were collected and scheduled for chemical analysis located within the study area. When compared to industrial/commercial assessment criteria, no exceedances were identified. Additionally, asbestos was not identified in the samples selected and all testing for polycyclic aromatic hydrocarbon (PAH), mineral oil, methyl tert-butyl ether (MTBE), benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and polychlorinated biphenyl (PCB) determinants were below the laboratory limits of detection.

3.7.33 Soil leachate testing was undertaken in 11 samples collected within the study area, and the testing was compared to Environmental Quality Standards (EQS). Several minor exceedances (within the same order of magnitude) were recorded for chromium, copper, cadmium and mercury.

3.7.34 Three rounds of groundwater monitoring and chemical sampling were undertaken within the BH1, BH4 and BH6 installed in 2024 ground investigation. The results were compared to the EQS, and a number of metal determinants were exceeded on-site and in BH4 located within the study area to the south. There were also notable exceedances for sulphate (as SO₄) and phenol, elevated most in BH4 close to historical mining activities.

3.7.35 Surface water monitoring undertaken within a nearby receptor, Ulley Brook, was also compared to the EQS and found minor exceedances of fluoranthene, chromium and chromium (III).

3.7.36 Beyond the chemical testing, no reports of visual or olfactory evidence of contamination were made within the soil and WM3 waste classification resulting in all 22 soil samples from the investigation being found to be non-hazardous.

Key Receptors and Value (Sensitivity)

3.7.37 Table 3.7.5 below provides a summary of the values assigned to receptors. These have been assigned using the criteria presented in Appendix B, Methodology.

Table 3.7.5 Key Land and Ground Conditions receptors

Receptor type	Receptors	Value (sensitivity)
Geology	Head deposits – Superficial (in study area)	Negligible
	Alluvium – Superficial (in study area)	Negligible
	Mexborough Rock – bedrock	Negligible
Human health	Construction workers	Very high
	Farmers and users of PRowS	High
	Existing off-site neighbours (commercial/residential properties)	Medium
	Users of development	Medium
Hydrogeology	Secondary A aquifers (alluvium and bedrock in study area)	Medium
	Secondary Undifferentiated aquifer (head in study area)	Low
Surface water	Ulley Brook, Whiston Brook and River Rother	Medium to high
Buildings/structures and services	Proposed overhead lines and pylons	Medium

Future Baseline

- 3.7.38 The existing baseline conditions with respect to ground conditions and hydrogeology are unlikely to change significantly within the time prior to the construction. Based on the available information, gross and widespread contamination is not anticipated, however this is subject to completion of site-specific ground investigation works to confirm if remediation is needed. Significant changes to ground conditions are not anticipated.

Potential Construction Impacts

- 3.7.39 Construction workers will be present during the construction of the Scheme. They will be exposed to soil and shallow groundwater (potentially contaminated) during earthworks including excavation, topsoil stripping, stockpiling, transportation and backfilling. Exposure could be through accidental ingestion, inhalation of dust and dermal exposure. Nearby residents could also potentially be exposed to dust blown from earthwork activities. Construction workers are considered to be of very high sensitivity and existing offsite neighbours (commercial and residential properties) of medium sensitivity. Assuming the appropriate mitigation measures detailed in Table 3.7.6 and paragraph 3.7.47, including adoption of an appropriate CEMP and Construction Phase (Health and Safety) Plan, the magnitude of impact is considered to be negligible. The level of effect is assessed as an overall **neutral** effect.
- 3.7.40 During construction activities there is the potential for accidental spillages of oils, chemicals, cement and fuels from the movement of construction traffic and the storage of chemicals. This could impact the underlying ground and nearby surface water (Ulley Brook), with the potential for contamination to migrate into the water environment. Geology across the land required to construct the Scheme is considered to have a **negligible** value. If the design and mitigation measures detailed in Table 3.7.6 and paragraph 3.7.47 are implemented, the magnitude of impact is considered to be **negligible** with an overall **neutral** level of effect.

Groundwater underlying the land required to construct the Scheme is considered to have a **medium** value with regards the alluvium superficial aquifer, and **low** value with regards to the superficial head and bedrock aquifers. With the implementation of the design and mitigation measures detailed in Table 3.7.6 and paragraph 3.7.47, the magnitude of impact is considered to be **minor adverse** with an overall **slight to neutral** level of effect. Surface water is considered to be of **medium to high** value, and assuming the appropriate environmental design measures and mitigation are adopted, the magnitude of impact is considered to be **negligible**. The level of effect is assessed as an overall **slight adverse to neutral**.

- 3.7.41 Geology across the land required to construct the Scheme is considered to have a **negligible** value with the magnitude of impact considered to be **negligible**. During any earthworks or foundation construction there is the risk of initiating ground failure. There are known historical opencast mine workings and outcropping coal seams in the east of the land required to construct the Scheme and the south west. Additionally, there are inferred faults in the south west and north east of land required to construct the Scheme. However, the 2023 mining risk assessment (Jacobs, 2023) and 2024 GIR (Jacobs, 2025) indicated that there was a low risk of impact to construction from historical mining. Any structure is considered to be of **medium** value and assuming the appropriate design measures and mitigation are adopted, the magnitude of impact is considered to be **negligible**. The level of effect is assessed as an overall **neutral** effect.

Potential Operational Impacts

- 3.7.42 Sustainable Drainage System (SuDS) are not proposed at this Site, therefore the risk of contaminant infiltration will not change. Therefore, the magnitude of impact is considered to be **negligible** and does not warrant further consideration.
- 3.7.43 As there are no planned enclosed buildings, users (e.g. maintenance workers) will not be affected by potential ground gasses and therefore there will be no future risk.
- 3.7.44 Geology across the land required to construct the Scheme is considered have a **negligible** value. The superficial deposits underly the west of the land required to construct the Scheme. The land required to construct the Scheme is located in a mineral safeguarding zone, likely in relation to the coal in the Middle Pennine Coal Measures (bedrock), however there is evidence that the shallow coal deposits have already been extracted south west and east of the land required to construct the Scheme. Given the limited footprint of the Scheme (pylons of overhead lines), it is considered there will be limited mineral resource loss. Therefore, the magnitude of impact is considered to be **negligible** with the level of effect assessed to be **neutral**.
- 3.7.45 Permanent structures may be affected by ground stability issues. There are known historical opencast mine workings with associated coal outcrops to the southwest and east of the land required to construct the Scheme. Additionally, there is an inferred fault onsite and coal seams are mapped on the BGS maps (2024) and Consultants Coal Mining Report (The Coal Authority, 2023). Nonetheless, the geotechnical appraisal in the Jacobs 2024 GIR indicated that the risk from historical mining is low where the new 400kV Long Lane Substation is proposed. Any structure is considered to be of **medium** value and assuming the appropriate design measures and mitigation are adopted, the magnitude of impact is considered to be **negligible**. The level of effect is assessed as an overall **neutral** effect.

Construction Control Measures

- 3.7.46 The control measures listed in Table 3.7.6 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP and their implementation will be monitored by National Grid.

Table 3.7.6 Construction control and monitoring measures for Land and Ground Conditions

Potential receptor and/or impact	Control, enhancement and monitoring measures
Human health – construction workers	Adoption of a CEMP and Construction Phase (Health and Safety) Plan.
Human health – nearby residents (commercial/residential properties)	Adoption of a CEMP and Construction Phase (Health and Safety) Plan.
Geology (contamination)	Adoption of a CEMP.
Geology (ground stability)	Appropriate geotechnical design. Update of the mining risk assessment with the information from the ground investigation. Application for a permit with the Mining Remediation Authority, if coal is encountered during construction works. Adoption of a CEMP and Construction Phase (Health and Safety) Plan.
Buildings/structures and services	Appropriate design of buried concrete (BRE, 2005)
Hydrogeology (Secondary A “local supplies” aquifers)	Should piled foundations be required it is recommended that a piling risk assessment is undertaken to assess the potential risks to groundwater and surface water receptors. Any recommended mitigation measures would be implemented through a CEMP.
Surface water (Ulley Brook)	Should piled foundations be required it is recommended that a piling risk assessment is undertaken to assess the potential risks to groundwater and surface water receptors (unlikely). Any recommended mitigation measures would be implemented through a CEMP.

- 3.7.47 During the construction works, the following will be incorporated by way of the CEMP:

- During removal of vegetation, stripping of topsoil, excavation, earthworks and construction, a watching brief protocol will be adopted as detailed in a CEMP, with site workers remaining vigilant such that visual or olfactory signs of contamination will be noted and that contaminated soil will be kept separate from other materials. Suspected contaminated material will be analysed to determine if it is suitable for re-use on-site (in accordance with agreed strategies) or requires disposal off-site to an appropriate soil recycling or disposal facility.
- In line with best practice and as detailed in a CEMP, prior to any construction compound area being prepared, a baseline survey will be undertaken to determine the current land quality across the compound area. This will identify localised contamination present above risk-based suitable-for-use criteria. If required, such areas will be remediated prior to, or as part of, the soil stripping/enabling works. Alternatively, other measures will be applied, such as using an appropriate cover system/barrier to reduce the risk of exposure to site workers and to prevent pathways to sensitive receptors. This may include impermeable bunding and sheeting to prevent the spread of existing contamination and potential leaching.
- Within any construction site compounds, specific areas will be designated for the storage of chemicals, waste oils and fuel and refuelling activities. These areas will be bunded and placed on hardstanding to prevent downward migration of contaminants. Any transfer of fuel or other potentially contaminated liquids will only take place within a designated fuel transfer area. Drip trays will be provided to reduce the risk of impact of spillages. These areas will be designed with appropriate drainage to ensure any spillages can be isolated.
- An Environmental Emergency Response Plan will be produced by the Contractor. Appropriate equipment (e.g. spill kits, absorption mats) will be made easily accessible on-site and personnel will be trained in using them. Clear protocols and communication channels will be provided to ensure that any spillages are dealt with immediately and adequately. This will prevent large areas of soil/geology potentially becoming contaminated and, in turn, protect surface and ground water quality.
- A repeat baseline survey will be undertaken once the construction has finished and the compound dismantled to demonstrate the area has been returned to its previous state. If contamination has occurred during the lifetime of the compounds, remediation will be undertaken to return the land to its previous land quality state as detailed in a CEMP.
- During construction, excavated soils will be appropriately stored to ensure that if dust is generated in dry weather periods, it is not directed towards existing properties. Other best practice measures such as damping down areas, vehicle wheel washing, and covering stockpiles and lorries containing soils will be utilised to reduce the impacts from dust.
- To avoid the spread of contaminants, contaminated soils (where identified by investigation) within areas to be excavated will be removed prior to the main works as detailed in a remedial method statement. Materials will be further assessed, and if necessary treated, for reuse within the land required to construct the Scheme, e.g. for use in areas of open space. Material that cannot be reused will be disposed of at an appropriate waste facility.

- If contaminated materials are proved suitable for use within less sensitive parts of the land required to construct the Scheme after agreement with the regulator, information about their location and quality will be included in the H&S file (prepared in accordance with the Construction (Design and Management) Regulations 2015) so that future works (i.e. in operational phase) know of their existence and can take the necessary precautions if they must work in that area.
- Any contaminated groundwater encountered during the construction phase will be treated/disposed of appropriately and with the necessary agreements in place. During the dewatering activities, consideration will be given to soil contamination in the locality to ensure that contaminants do not become mobilised and enter the water environment.
- To reduce the risk to surface water, excavated materials will be appropriately stored to ensure that water runoff from stockpiles does not enter the water environment via drains and nearby watercourses. If necessary, stockpiles will be covered. Pollution prevention best practice protocols will be adopted to ensure contamination does not enter surface water.
- A Site Waste Management Plan and an Outline Materials Management Plan (that will form part of a CEMP and will be developed by the Contractor) will be prepared following the protocols within the CL:AIRE Definition of Waste: Development Industry Code of Practice (CL:AIRE, 2011) to ensure that excavated materials are re-used appropriately and sustainably in line with the waste hierarchy, as required. Materials designated for re-use but classified as hazardous should be re-used in accordance with the Environmental Permitting Regulations and may require remediation or sorting/segregation, as required.
- During the construction phase, construction/site workers could be exposed to localised contaminated if present, via accidental ingestion, inhalation or dermal contact with soil and any contamination present. To mitigate risks from contaminated soils/materials, all persons engaged in site construction works will be made aware of the findings of the intrusive investigations and the hazards associated with handling potentially contaminated materials via a CEMP, Construction Phase (Health and Safety) Plan and toolbox talks.
- Suitable Personal Protective Equipment (PPE) including Respiratory Protective Equipment (RPE) (if necessary) will be available to all site workers as detailed in the construction Phase (Health & Safety) Plan. Appropriate site hygiene protocols will be adopted during the construction phase.
- Where hazardous chemicals are used in the construction works, risk assessments will be made and detailed in a CEMP.

Operational Control Measures

- 3.7.48 The measures listed in Table 3.7.7 will be implemented during the operational phase of the Scheme and the appraisal has been undertaken assuming these measures are in place.

Table 3.7.7 Operational control and monitoring measures for Land and Ground Conditions

Potential receptor and/or impact	Control, enhancement and monitoring measures
Geology (ground stability)	Implementation of the recommendations from the geotechnical appraisal in the Jacobs 2024 GIR.
Hydrogeology (Secondary A “local supplies” aquifers)	Given the limited footprint of the infrastructure and no planned SuDS, no operational control measures are considered necessary.
Surface water	Given the limited footprint of the infrastructure and no planned SuDS, no operational control measures are considered necessary.
New buildings/ infrastructure	Given the limited footprint of the infrastructure, no operational control measures are considered necessary.

3.8 Noise and Vibration

Introduction

- 3.8.1 This section details the Noise and Vibration baseline conditions and the environmental appraisal of the potential Noise and Vibration impacts associated with the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.8.2 The residual impacts of construction noise and vibration have been scoped out of this EAR on the basis that this will be mitigated through the implementation of a Noise and Vibration Management Plan, via a CEMP, and due to the temporary nature of the construction impact. Operational maintenance activities will also be managed by the implementation of noise and vibration management measures.
- 3.8.3 Operational noise impacts are most likely to be associated with the new 400kV Long Lane Substation proposed alongside the Scheme. This substation has been appraised and consented separately (planning application reference: RB2025/1468). Information about the operational noise impacts of the new 400kV Long Lane Substation is therefore presented as part of this appraisal, alongside the appraisal of noise from the operation of overhead lines.
- 3.8.4 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Methodology; and Appendix F, Noise Impact Assessment.

Study Area

- 3.8.5 Given the nature of the Scheme, the study area for Noise and Vibration comprises the land required to construct the Scheme, including the land required for the new 400kV Long Lane Substation, and 200m either side of the proposed overhead lines as well as those to be retained.

Consultation

- 3.8.6 No further consultation has been undertaken for Noise and Vibration and the Scheme.

Baseline

Existing Operational Noise Sources

- 3.8.7 The Scheme is centred around the proposed new 400kV Long Lane Substation, as well as being located east of the existing Brinsworth Substation. Items of equipment generally termed 'reactive plant' are usually the main sources of noise in high voltage substations. Reactive plant, such as super grid transformers and shunt reactors, are predominantly responsible for the tonal 'hum' associated with substations.
- 3.8.8 Insulators, and Gas Insulated Busbar, will under certain conditions 'crackle' or 'fizz' due to the occurrence of a phenomenon called corona discharge. Corona discharge may be audible when close to the substation, but it is not continuous and not considered to be a major source of noise.

Noise from Overhead Lines

- 3.8.9 Noise from high voltage overhead lines is primarily due to corona discharge. Line noise is generated when the conductor surface voltage gradient (electric stress, or E_{max} expressed in kilovolts per centimetre (kV/cm)) exceeds the inception level for corona discharge activity which is released as acoustic energy and radiates into the air as sound. In UK conditions, the corona inception level is regarded to occur when electric stress is in the range 17 to 20kV/cm. Whilst most high voltage overhead lines are designed to operate below this level, those that operate close to this may produce audible noise when enhancement of conductor surface electric stress occurs due to rainfall (wet noise) or the presence of conductor surface contamination (dry noise). Overhead lines that operate below the corona inception level are much less likely to produce audible noise.
- 3.8.10 When it occurs, overhead line noise can be described as a 'crackle', which is sometimes accompanied by a tonal 'hum' in wet conditions. The highest noise levels generated by an overhead line generally occur during rainfall. Hum, if it occurs, is typically more annoying than crackle alone and therefore the occurrence of wet noise is considered worst-case.

Acoustic Survey Observations

- 3.8.11 During the installation and collection of the noise monitoring equipment, the acoustic environment was dominated by traffic along the M1, occasional birdsong, and infrequent overhead aircraft.

Noise Sensitive Receptors

- 3.8.12 Residential receptors surrounding the land required to construct the Scheme are considered to be the most exposed receptors that could be affected by the Scheme. These are:

- Whiston Vale – residential properties located north east of the Scheme (from the noise modelling, 41 Whiston Vale is considered the most exposed building for receptors along Whiston Vale); and
- Games – residential property located west of the Scheme.

3.8.13 The receptors above are considered the most sensitive due to their proximity to the Scheme.

3.8.14 Further details on the location of the noise sensitive receptors can be found in Appendix F, Noise Impact Assessment.

Potential Construction Impacts

3.8.15 The construction phase of the Scheme may potentially introduce additional sources of noise and vibration, such as construction activities and construction traffic, plant and equipment. These impacts will be temporary and transitory in nature, due to the phased nature of removing and constructing overhead lines.

Potential Operational Impacts

3.8.16 National Grid has committed to embedded mitigation for reducing operational noise, set out in its Operational Audible Noise Policy for Overhead Lines (PS(T)134), in the form of a conductor system or alternative technology that performs to the same or better standard than the existing overhead lines in relation to noise on standard lattice pylons. This would be a similar design to the existing 400kV overhead line. Due to its geometrical configuration, the design is one of the least electrically stressed conductor systems that National Grid uses, reducing the effects of dry and wet noise from the proposed 400kV overhead line during operation.

3.8.17 Where modifications for existing transmission overhead lines are required, like-for-like conductors are proposed. No change in noise is therefore expected in these situations, and no further assessment has been undertaken.

3.8.18 Noise from the operation of the scale and type of overhead line proposed and to be retained, even in worst-case wet weather conditions, would be below impact criteria for noise sensitive receptors. Noise sensitive receptors within 200m of the proposed and retained overhead lines are therefore more likely to experience noise from operation of the existing and proposed substations than operation of the overhead lines. There would therefore be no noise impacts associated with the operation of the Scheme.

3.8.19 Based on the acoustic modelling undertaken for the proposed new 400kV Long Lane Substation, the noise impacts are anticipated to be negligible to all receptors. Therefore, a power quality filter, circuit breakers, disconnectors and relay room are considered suitable to mitigate potential noise impacts from the Scheme. No further acoustic mitigation is proposed.

Construction Control Measures

3.8.20 National Grid is committed to implementing control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme.

3.8.21 The following measures contain outline proposals to manage noise and vibration during construction and will be included in the CEMP:

- commitments for active control of construction noise and vibration, including issues such as specific and detailed complaint procedures, community liaison, compliance survey requirements and a risk based mitigation scheme to control noise and vibration on an ongoing basis;
- mitigation strategies formulated on the basis of 'Best Practicable Means';
- undertaking construction during the proposed working hours;
- recommendations and good practice as detailed in BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise and Part 2: Vibration;
- measures as set out in BS 5228 Code of practice for noise and vibration control on construction and open sites including:
 - careful planning of methodology, programming of the works at less sensitive times and selection of plant to minimise adverse impacts;
 - selection of plant that conforms with relevant national or international standards, directives and recommendations on noise and vibration emissions;
 - location of construction plant as far as is reasonably practicable away from adjacent occupied buildings, or as close as possible to noise barriers or Site hoardings where these are located between the plant and buildings;
 - selection and location of generators so as to minimise adverse impacts on the local community;
 - fitting static and semi-static plant/equipment with suitable enclosures where practicable;
 - instruction of personnel on best practicable means to reduce noise and vibration, as part of induction training and prior to specific work activities;
 - shut down of plant and vehicles when not in use, i.e., no idling;
 - audible warning systems and alarms designed to minimise noise;
 - broadband reverse alarms fitted to all vehicles;
 - notification of local residents in advance of works commencing; and
 - use of localised mobile screening where reasonably practicable to reduce noise levels from handheld tools such as concrete saws.
- implementation of appropriate construction traffic routeing to minimise noise impacts on sensitive receptors. Details of the routeing of construction vehicles and visitors to the construction areas will be agreed with RMBC; and
- all construction traffic entering and leaving the construction areas will be closely controlled. Vehicles making deliveries or removing material will travel via designated routes. Measures will be taken to review and reduce, where possible, the numbers of construction vehicles accessing the construction areas during peak hours, by adopting measures such as 'just-in-time' deliveries.

Operational Control Measures

3.8.22 No further measures are proposed during operation of the Scheme.

3.9 Traffic and Transport

Introduction

- 3.9.1 This section details the Traffic and Transport baseline conditions and the environmental appraisal of the potential Traffic and Transport impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.9.2 This section should be read in conjunction with Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations; Appendix B, Long Lane New Overhead Lines Methodology; Appendix C, Long Lane Overhead Works Plans; and Appendix D, Long Lane New Overhead Lines Drawings.

Study Area

- 3.9.3 The study area for Traffic and Transport is limited to roads along the proposed construction route including Long Lane, Bole Hill, Pleasley Road, Flatts Lane, Haworth Lane, the A631 West Bawtry Road and the A630 (non-Strategic Road Network (SRN) section). Beyond these roads, the construction traffic will be distributed onto the M1 which forms part of the SRN, dispersing further along numerous SRN routes, and the effect of the additional traffic will be diluted. The proposed construction route and construction accesses where construction vehicles depart the public highway is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route.

Consultation

- 3.9.4 Consultation was undertaken with RMBC in 2024 for the separate substation development, and the “tie in” works were included within this. Table 3.9.1 provides a summary of the issues raised and agreed during consultation with respect to Traffic and Transport.

Table 3.9.1 Summary of consultation

Consultee/date	Summary of issues raised/agreed
RMBC – local highway authority (28 June 2024)	<p>A request was submitted for an opinion on the Traffic and Transport proposed approach, which includes the methodology, the proposed construction route, and mitigation measures. This was for the new 400kV Long Lane Substation construction route, however this is shared by construction vehicles associated with the Scheme.</p> <p>The following response was received:</p> <ul style="list-style-type: none">‘Overall, no objections to the route or approach. However, requested for information regarding the size and frequency of heavy goods vehicles (HGVs) accessing the scheme to be shared/discussed.Provided contact for consultation regarding affected PRow’.

Consultee/date	Summary of issues raised/agreed
Rotherham District Council – Public Rights of Way Officer (2 August 2024)	<p>A request was submitted for an opinion on the PRowWs that will be affected by the Scheme.</p> <p>The following response was received:</p> <ul style="list-style-type: none"> • <i>‘Attachment of the application form that would need to be completed and returned for the temporary closures to be arranged. Three weeks’ notice for advertisement purposes will be required.</i> • <i>No surveys would need to be undertaken for the purpose of temporary closures; however, alternative routes would need to be shared/discussed including the duration of closures’.</i>
National Highways (July 2026)	<p>RMBC consulted with National Highways on the information submitted as part of the Form B process. National Highways responded to confirm the information it requires about construction methodology, programme and mechanisms, and which will be provided by National Grid and its delivery partners.</p>

Baseline

Local Highway Network

- 3.9.5 The extent of highway network considered within this appraisal was informed by the proposed construction route identified for material and equipment delivery to the Scheme and by roads which will be used by construction staff traffic. The construction route consists of Long Lane, Bole Hill, Flatts Lane, Pleasley Road, Haworth Lane, A631 West Bawtry Road and the A630 connecting to the M1 Junction 33 (Catcliffe Roundabout) which forms part of the SRN. The proposed construction route is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route.

A630 (dual carriageway section)

- 3.9.6 The assessed section of the A630 is a dual carriageway road between Catcliffe Roundabout and Rotherway Roundabout. It has two lanes in each direction, is subject to a speed limit of 50mph, is well lit, and is fronted by agricultural land and the existing Brinsworth Substation. There are no footways along the A630 mainline. However, there is a footway along the northern section of Rotherway Roundabout connecting to the A631 West Bawtry Road. There are no sensitive receptors in the vicinity of the proposed construction route identified along this section of the A630 Rotherway Road.

A631 West Bawtry Road (dual carriageway section)

- 3.9.7 The assessed section of the A631 West Bawtry Road is a dual carriageway road between Rotherway Roundabout and the junction with Pleasley Road. It has two lanes in each direction, is subject to a speed limit of 50mph, is not lit, and is fronted by agricultural land and the town of Rotherham. To the west of Long Lane, a shared footway for pedestrians and cyclists extends up to a staggered signalised toucan crossing, which then connects to the shared footway on the northern side of the A631 which is between 2.5m and 3m wide.

- 3.9.8 On the southern side of the A631 to the west of the junction with Long Lane, there is a grassed verge separated from the carriageway by a wooden fence which connects to an uncontrolled pedestrian crossing and access to PRoW Whiston Footpath no.9.

Haworth Lane (off A631 West Bawtry Road (dual carriageway section))

- 3.9.9 One of the construction routes uses Haworth Lane from the A631, accessing the land required to construct the Scheme via Haworth Lane. The existing junction between the A631 and Haworth Lane is approximately 80m east of the Rotherway Roundabout. Entry onto Haworth Lane is allowable from both directions with a right turn lane on the eastbound A631 to facilitate the right turn movement, although exit onto the A631 is left turn only. Haworth Lane is a no through road and is also private, therefore traffic movement is anticipated to be minimal. Due to the private nature of this road and with the established junction, the level of impact on this road is expected to be not significant. Therefore, this road has been excluded and not assessed in this appraisal.

Long Lane

- 3.9.10 The assessed section of Long Lane is a single carriageway road with one lane in each direction and a carriageway width approximately 5.5m. It is subject to the national speed limit (60mph), is well lit, has no footways and is fronted by agricultural land. There are no sensitive receptors in the vicinity of the proposed construction route identified along this section of Long Lane.

Bole Hill

- 3.9.11 Bole Hill forms the southern continuation of Long Lane. The assessed section of Bole Hill is a single carriageway road with one lane in each direction and a carriageway width approximately 9m wide. It is subject to a speed limit of 30mph and is lit. On the transition between Long Lane and Bole Hill there is a short section (approximately 170m) of unsegregated on-road cycle lane in the southbound direction. This ends at the junction between Bole Hill and Spa Well Crescent. Up to this point from Long Lane in the north, Bole Hill has a footpath on the eastern side of the road (adjacent to the southbound traffic lane) only. From the south of this junction, Bole Hill has footways on both sides of the road and is fronted by residential dwellings. There are no sensitive receptors in the vicinity of the proposed construction route identified along this section of Bole Hill.

Flatts Lane

- 3.9.12 The assessed section of Flatts Lane is a single carriageway road with one lane in each direction and a carriageway width approximately 6m, connecting to Bole Hill in the south. It provides access to approximately 20 properties including those on Flatts Close (a cul-de-sac) and a few on Flatts Lane. It is subject to a speed limit of 30mph, is lit and is fronted by agricultural land and residential dwellings. On the eastbound side of the carriageway, there is a footway measuring approximately 2m. Flatts Lane is private beyond 200m north of its junction with Bole Hill.

A618 Pleasley Road

- 3.9.13 The assessed section of Pleasley Road is a single carriageway road. It has one lane in each direction, is subject to a speed limit of 30mph within Whiston, 50mph continuing south for approximately 1km and then 60mph beyond towards Aughton.

For the 30mph section, it is lit, has footways on both sides of the carriageway and is fronted by agricultural land and residential dwellings. The 50mph section is unlit, with footways on both sides of the carriageway and is fronted by agricultural land. The 60mph section is also unlit, with a shared use footpath located on the western side and is similarly fronted by agricultural land. All the footways adjacent to the carriageway are approximately 2m to 4m in width.

Public Transport

3.9.14 Public transport in the vicinity of the Scheme includes several bus services that route on the A631, near the junction with Long Lane, and Pleasley Road.

- **A631 West Bawtry Road**

- Service no. X7 Maltby – Pond Street at Sheffield Interchange (Monday to Friday 6:25am–7:45am, and 4:43pm–6:04pm in the opposite direction);
- Service no. X11 Doncaster Interchange – Sheffield Interchange;
- Service no. 207 Sheffield City Centre – Rotherham; and
- Service no. 608 Sheffield – Whiston (school bus).

- **Pleasley Road**

- Service no.20 Rotherham – Dinnington; and
- Service no.21 Rotherham – Harthill.

- **Bole Hill**

- Service no.73 Rotherham – Sheffield City Centre via Treeton; and
- Service no.95 Walkley – Rotherham.

3.9.15 The closest bus stops to the construction accesses served by these bus services are located on the following roads:

- The A631, approximately 400m walking distance north of the Scheme access point on the A631. There are two bus stops at this location: one for eastbound and the other westbound.
- Bole Hill, approximately 160m walking distance south of the Scheme access point on Flatts Lane. There is one bus stop at this location for southbound travel.
- Pleasley Road near Upper Whiston Lane, approximately 140m walking distance north of the northernmost Scheme access point on Pleasley Road. There are two bus stops at this location, one for northbound travel and one for southbound travel.
- Pleasley Road near Reservoir Road, approximately 190m walking distance north of the southernmost Scheme access point on Pleasley Road. There are two bus stops at this location, one for northbound travel and one for southbound travel.

3.9.16 No bus stops are located on the A630 or on the Long Lane sections of the construction route.

3.9.17 The closest railway station is Rotherham Central Station which is a driving distance of 4.1km from the proposed Scheme access on A631 West Bawtry Road. The station is managed by Northern Railway, providing a service to Adwick, Leeds, Parkgate,

and Sheffield. Additionally, a service to Sheffield Cathedral Square is provided by Sheffield Supertram.

Cycling, Walking and Equestrian Provision

- 3.9.18 Key elements of the existing walking and cycling infrastructure along the proposed construction route are as follows.
- 3.9.19 The PRowS in the vicinity of the land required to construct the Scheme are shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route. There are nine PRowS within the land required to construct the Scheme:
- Whiston footpath no.7 spans primarily in the south west – north east direction connecting Pleasley Road in the north east and intersecting Long Lane to the south west.
 - Whiston footpath no.9 connects to Whiston footpath no.7 to the west of where it intersects Long Lane and spans north west before heading north east to connect onto the A631 West Bawtry Road.
 - Whiston footpath no.10 spans in the north west – south east direction and connects to Whiston footpath no.12 at its south eastern end.
 - Whiston footpath no.12 spans in the south west – north east direction connecting Long Lane to The Green, whilst intersecting Pleasley Road to the south of Whiston footpath no.7. The south eastern end of Whiston footpath no.10 meets the middle of Whiston footpath no.12 within the land required to construct the Scheme in its upper central area.
 - Whiston footpath no.13 connects Whiston footpath no.12 to Pleasley Road in a north west – south east direction.
 - Treeton footpath no.1 is a continuation of Whiston footpath no.7 to its south west and continues south west to Flatts Lane, where it connects to Treeton footpath no.2.
 - Treeton footpath no.4 connects Pleasley Road in the north east to Bole Hill in the south west.
 - Whiston footpath no.15 connects Pleasley Road in the south west to Doles Lane in the north east.
 - Treeton footpath no.2 connects Long Lane in the east and Flatts Lane to the west, where Flatts Lane provides construction traffic access rights to the Scheme.
- 3.9.20 There are a further 14 footpaths and one bridleway located within 500m of the land required to construct the Scheme.
- 3.9.21 Doorstep Walk Number 14 (RMBC) is located to the north east.
- 3.9.22 During construction, Whiston Footpath no.12 will remain open with the proposed separation between public and construction users. For the other eight PRowS mentioned above, temporary closures with diversions will be provided during construction.

- 3.9.23 For sections of the Doorstep Walk and Rotherham Round Walk where they fall within land required to construct the Scheme, a temporary closure with diversion will be provided during construction.
- 3.9.24 There are a number of warning signs showing accompanied horses or ponies for drivers on Long Lane and Pleasley Road:
- Long Lane: one sign on the approach to the A631 West Bawtry Road in the northbound direction;
 - Long Lane: two signs on the approaches to the Treeton footpath no.12, which connects Long Lane to itself, therefore having two accesses. The two warning signs are on the north/eastbound direction at the southern access and the south/westbound direction on the approach to the northern access of the Treeton footpath no.12; and
 - Pleasley Road: one sign adjacent in the northbound direction adjacent to the access onto Whiston footpath no.15.
- 3.9.25 The Scheme would not permanently impact or change existing highway infrastructure or PRoWs. It has been assumed that temporary PRoW diversions and stone roads will be removed following construction. However, discussions with the local highway authority (LHA) could be undertaken to identify locations where it may be favourable to retain such infrastructure.

National Cycle Network Route 6

- 3.9.26 National Cycle Network Route 6 runs from Watford, Luton, Milton Keynes, Northampton, Market Harborough, Leicester, to Sheffield, Manchester, and Lancashire to Windermere. The route overlaps the proposed construction route along Pleasley Road in two locations, from its junction with the A631 West Bawtry Road to its junction with Chaff Lane to the south, a distance of approximately 300m, and also between its junction with Guilthwaite Common Lane and Reservoir Road, a distance of approximately 360m, this section is provided as a shared footway. The location of this route is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route.

Traffic Flows

- 3.9.27 Annual Average Daily Traffic (AADT) flow data has been obtained from the Department for Transport (DfT) website. The traffic count locations are shown on a plan in Appendix D, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route. In the interests of providing a more robust assessment, which takes account of the traffic flows during the assessed construction period (7am–7pm), the AADT data was used to calculate traffic flows within this period for a typical weekday. The AADT flows were converted into Annual Average Weekday Traffic (AAWT) flows and 12-hour flows (7am–7pm) by applying an appropriate factor. This factor was derived from a standard daily traffic profile from the DfT's online road traffic statistics Table TRA0307 (DfT, 2024).
- 3.9.28 Additional traffic flows data were obtained via commissioning traffic surveys. These were undertaken for a one-week period, for 24 hours between 2 July and 8 July 2024 to avoid the school summer holidays. This data was collected via Automatic Traffic Counts (ATC) on Long Lane and the A631 West Bawtry Road. The locations of traffic

counts are shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1.

- 3.9.29 Background traffic growth is anticipated to occur between 2024 (for which existing traffic flows are available) and the following two years:
- 2028 – when peak cumulative traffic movements are predicted to occur with the identified committed developments. This will be for the following roads where the construction traffic routes are expected to overlap: A630, A631 West Bawtry Road and Long Lane; and
 - 2029 – when peak HGV movements are predicted to occur for the overhead line activity, but do not coincide with the construction route of other committed developments. This will apply to the following roads: Bole Hill, Pleasley Road and Flatts Lane.
- 3.9.30 To account for this growth an appropriate growth factor derived from Trip End Model Presentation Program (TEMPPro) has been applied to the traffic flow data.
- 3.9.31 The resultant predicted 2027 future baseline AAWT 12-hour (7am–7pm) flows on road links along the construction routes are shown in Table 3.9.2.
- 3.9.32 For Bole Hill, there are no publicly available traffic counts for this road. As it is a continuation of Long Lane to the south, with a limited number of no-through roads and properties connecting to it, the data obtained from the southern ATC on Long Lane is considered to be representative of this road.
- 3.9.33 For Flatts Lane, there are no publicly available traffic counts for this road. As it is a private road beyond 200m north of its junction with Bole Hill, only provides access to a number of residential properties and is a cul-de-sac, the number of vehicles on this road is anticipated to be minimal. It is therefore considered that any impact from the Scheme on this road would also be limited. Given the nature of the road, the expected traffic and there being no sensitive receptors, it is considered the level of impact on this road would not be significant. Flatts Lane has therefore been excluded and not assessed in this appraisal.

Table 3.9.2 Future Baseline traffic AAWT flows, 12hrs (7am–7pm) both directions

DfT/ATC ref.	Road	Two-way 12hr (7am–7pm) flows	
		HGVs	Total vehicles
Future Baseline Year 2028 (peak cumulative traffic year for Scheme and committed development on overlapping construction route)			
37899	A630	1,670	29,626
47409	A631 West Bawtry Road	463	30,620
ATC 1	A631 West Bawtry Road	465	29,330
ATC 2	Long Lane	36	1,418
Future Baseline Year 2029 (peak construction traffic for Scheme)			
As ATC 2	Bole Hill	37	1,427
77548	Pleasley Road	130	11,987
37425	Pleasley Road	118	10,799

3.9.34 For the Future Baseline years, the average weekday 12-hour (7am–7pm) HGV flows on the roads that form the construction route are between 36 HGVs (on Long Lane in 2028) and 1,670 HGVs (on the A630 in 2028). Average weekday 12-hour (7am–7pm) total vehicle flows are between 1,418 (on Long Lane in 2028) and 30,620 vehicles (on the A631 West Bawtry Road in 2028).

Sensitive Receptors

3.9.35 There are no potential sensitive receptors within 150m of the construction route.

3.9.36 However, other receptors that could potentially be affected during construction include:

- residents of houses and farms along the construction traffic routes;
- users of the PRoW network in the vicinity and crossing the construction traffic routes. This includes Treeton Footpath no.1, 2, 4, Whiston Footpath no.7, 9, 10, 12, 13 and 15;
- users of National Cycle Network Route 6 and cycle lanes; and
- drivers and passengers, which includes commercial, emergency and freight vehicles.

Collision Data

- 3.9.37
- The latest three-year personal injury collision data (2022–2024) was obtained from Crashmap.co.uk (Crashmap, 2025) for the roads forming the construction route and for access to the land required to construct the Scheme.
- 3.9.38
- Table 3.9.3 provides a summary of all collisions by severity for each road link and junction on the construction route. Location plans showing all collisions along the proposed construction route are presented in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.9.1 Traffic and Transport Assessment Proposed Construction Route.

Table 3.9.3 Summary of total collisions by severity on road links and junctions

Location	Severity			
	Slight	Serious	Fatal	Total
Catcliffe Roundabout	9	1	0	10
A630 (south of Rotherway Roundabout)	0	1	0	1
Rotherway Roundabout	2	2	0	4
A631 West Bawtry Road	2	0	1	3
Long Lane	0	1	0	1
A631 West Bawtry Road/Pleasley Road Junction	6	0	0	6
Pleasley Road	2	2	1	5
Total	21	7	2	30

- 3.9.39
- The analysis of the collision data identified the following:
- Total of 30 collisions were recorded along the construction route between 2022 and 2024, 21 (70%) were of ‘slight’ severity, 7 (23%) were classified as ‘serious’ and 2 (7%) were of ‘fatal’ severity;
 - Two fatal collisions were recorded along the proposed construction route: one on A631 West Bawtry Road near the junction with Long Lane and one on Pleasley Road over the M1;
 - One serious collision was recorded on Long Lane;
 - Two collisions involving cyclist casualties were recorded: one on West Bawtry Road east of the Rotherway Roundabout and one on Pleasley Road over the M1; and
 - No collisions involving a pedestrian casualty was recorded. However, three collisions resulted in a motorcyclist casualty: one at Catcliffe Roundabout, one on A631 West Bawtry Road east of the Rotherway Roundabout and one at the A631 West Bawtry Road junction with Pleasley Road.

- 3.9.40 There is a collision cluster on the southern section of the Rotherway Roundabout. A total of four collisions occurred within 100m of each other, two of which were classified as serious in severity, and two as slight in severity. Two of these collisions occurred on the southern internal section of the roundabout, and the remaining two occurred on the approach to the roundabout.
- 3.9.41 There is a collision cluster at the junction between West Bawtry Road and Pleasley Road. A total of five collision occurred within 100m of each other on the A631, all of which were classified as slight in severity.

Traffic Generation

- 3.9.42 Table 3.9.4 below shows the estimated maximum daily traffic movements associated with construction activities, which includes HGVs and the car/Light Goods Vehicle (LGV) movements associated with construction staff travelling to and from the Scheme.

Table 3.9.4 Peak daily indicative maximum construction vehicle movements

Vehicle type	Total vehicles	Total movements
Future Year 2028 (peak cumulative traffic for Scheme and committed development on overlapping construction route: A630, A631 Bawtry Road and Long Lane)		
HGVs	1	2
Cars/LGVs	17	34
Total	18	36
Future Year 2029 (peak construction traffic for Scheme, no overlap with committed development: Bole Hill, Pleasley Road and Flatts Lane)		
HGVs	6	11*
Cars/LGVs	18	36
Total	24	47

*Odd value due to inclusion of one crane (arrival or departure) as a worst case

- 3.9.43 For the period where the peak cumulative traffic is expected, it can be seen from Table 3.9.4, there will be a maximum total of 36 vehicle movements generated by the Scheme onto each of the roads assessed. This equates to three vehicle movements per hour across the day (7am–7pm).
- 3.9.44 Only the construction vehicles associated with the overhead line activity will use Bole Hill, Pleasley Road and Flatts Lane as the construction route at these locations do not overlap with other committed development traffic. A maximum total of 47 vehicle movements is expected to be generated by the Scheme on these roads. Of these, 10 movements will be by HGVs and one movement will be by a crane. In total, this equates to four vehicle movements per hour across the day (7am–7pm).
- 3.9.45 For the assessment it has been assumed as a worst case that all construction vehicle movements shown in Table 3.9.4 occur on each of the roads that provide direct access only to the Scheme (Bole Hill, Pleasley Road and Flatts Lane).

However, it is unlikely that this would occur at the same time on each of these roads during the peak construction period.

- 3.9.46 Based on the indicative construction traffic estimates, construction will commence in July 2027 and end in June 2031. Peak cumulative construction traffic where it overlaps with committed development activity is anticipated to occur over a two-month period during September and October 2028. The peak construction traffic generated by the overhead line activity where it does not overlap with other committed developments are expected to occur over a four-month period between December 2028 to March 2029, the future baseline year 2029 has been used as worst case.

Committed Developments

- 3.9.47 Committed developments identified within the Traffic and Transport study area included within the cumulative impact assessment are set out Table 3.9.5; these were considered as all the following criteria are met:
- Construction or operational traffic route coincide with the Scheme's construction traffic route; and
 - Construction or operational traffic trips generated will occur during the peak construction period of the Scheme.
- 3.9.48 The development Land south of West Bawtry Road, Whiston (planning reference RB2025/1420) was reviewed, and the construction is likely to overlap with the Scheme construction phase as it is expected to be operational in 2031. However, as no construction phase information or impacts are identified in the information currently available, it is not possible to include in this appraisal as a cumulative development. The Scheme activity for the period between October 2030 and June 2031 (potential overlap between January and June 2031) is associated with reinstatement, close out and demobilisation. The Scheme traffic associated with these activities are anticipated to be limited and less than those stated in Table 3.9.4, and hence this overlap scenario has not been assessed.

Potential Construction Impacts

- 3.9.49 The peak daily (7am–7pm) construction activity for the Scheme is anticipated to occur in 2029. Table 3.9.7 presents the predicted increase in HGV and total traffic on road links that form the proposed construction routes as a result of this activity. This table also presents the Scheme construction flow during the period where the combined traffic with the committed development traffic considered is at its peak, occurring in 2028.
- 3.9.50 An assessment has been undertaken on the potential construction impacts of the Scheme when combined with other committed developments to represent the peak daily worst-case on all roads forming the proposed construction route. It was identified that this would occur over a two-month period within 2028. The impact of the Scheme alone on the road links where the construction traffic overlaps are presented in Table 3.9.6.
- 3.9.51 Table 3.9.6 presents the future baseline traffic flows on all road links forming the proposed construction route derived from applying TEMPro growth factors and identifies the combined flows associated with the Scheme and other committed

developments. The increase in these combined total and HGV traffic flows and associated percentage increase against the future baseline has been presented.

- 3.9.52 As can be seen from Table 3.9.6, the predicted increase in construction HGV traffic on all the roads assessed against the 2029 future baseline flows do not exceed the 30% threshold recommended in the Institute of Environmental Management and Assessment (IEMA) (2023) guidance. As such, a full appraisal of potential residual effects on existing and future road users and potential receptors is not required.
- 3.9.53 Bole Hill has the largest percentage increase in HGVs as a result of the construction of the Scheme at 30%. Bole Hill is to the south of Long Lane and the A631 West Bawtry Road and will be used to provide access to a Construction access to the Scheme. The route has been identified as not sensitive due to there being no sensitive receptors along the section of Bole Hill assessed.
- 3.9.54 While the projected percentage increase in HGV traffic is higher than the other roads assessed, it must be seen in the context of the future traffic baseline on Bole Hill which is very low (37 HGVs) and the increase (11 HGV movements in 12 hours) does not exceed the 30% threshold recommended in the IEMA (2023) guidance.
- 3.9.55 It should be noted that the construction phase will be temporary, and appropriate control measures aiming to reduce adverse effects from traffic associated with the proposed Site will be included in the CEMP and are outlined in Construction Control Measures below.
- 3.9.56 The potential impacts along Bole Hill and the roads on the proposed construction route for the Scheme will be short-term and temporary in nature and are therefore considered to be negligible.

Table 3.9.5 Short-list of committed developments included within the Traffic and Transport assessment

Reference	Name of committed development	Status	Construction route overlap	Description of the committed development	Traffic included in assessment
1	Land at Long Lane, Whiston, N/A (planning ref: RB2025/1468)	Awaiting decision	A630 A631 West Bawtry Road Long Lane	Erection of a new 400kV Gas Insulated Switchgear	Construction trips – Development construction period between September 2026 and January 2031 (Construction trips for 2028 cumulative peak period – 8 HGVs, 180 Cars/LGVs)

Table 3.9.6 Predicted increase from Scheme construction traffic against Future Baseline flows

DfT counter/ ATC ref.	Road	2029 Future Baseline 12hr flows (7am–7pm)		Construction traffic movements, per day			Percentage increase in 12hr flows (7am–7pm)		Road sensitivity
		HGVs	Total	HGVs	Cars/vans	Total	HGV	Total	
Future Year 2028 (Scheme and Committed developments peak)									
37899	A630	1,670	29,626	2	34	36	0%	0%	Not Sensitive
47409	A631	463	30,620	2	34	36	0%	0%	Not Sensitive
ATC 1	A631	465	29,330	2	34	36	0%	0%	Not Sensitive
ATC 2	Long Lane	36	1,418	2	34	36	5%	3%	Not Sensitive
Future Year 2029 (Scheme only peak)									
As ATC 2	Bole Hill	37	1,427	11	36	47	30%	3%	Not Sensitive

DfT counter/ ATC ref.	Road	2029 Future Baseline 12hr flows (7am–7pm)		Construction traffic movements, per day			Percentage increase in 12hr flows (7am–7pm)		Road sensitivity
		HGVs	Total	HGVs	Cars/vans	Total	HGV	Total	
77548	Pleasley Road	130	11,987	11	36	47	8%	0%	Not Sensitive
37425	Pleasley Road	118	10,799	11	36	47	9%	0%	Not Sensitive

Table 3.9.7 Predicted increase from Scheme construction traffic and committed developments against Future Baseline flows

DfT counter/ ATC ref.	Road	2029 Future Baseline 12hr flows (7am–7pm)		Construction traffic movements, per day			Percentage Increase in 12hr flows (7am– 7pm)		Road sensitivity
		HGVs	Total	HGVs	Cars/vans	Total	HGV	Total	
Future Year 2028 (Scheme and Committed developments peak)									
37899	A630	1,670	29,626	10	214	224	1%	1%	Not Sensitive
47409	A631	463	30,620	10	214	224	2%	1%	Not Sensitive
ATC 1	A631	465	29,330	10	214	224	2%	1%	Not Sensitive
ATC 2	Long Lane	36	1,418	10	214	224	27%	16%	Not Sensitive

Potential Operational Impacts

3.9.57 During normal operation of the Scheme, it is understood that the only traffic generated would be associated with infrequent (assumption of less than 10 vehicles per year) repair and routine maintenance and inspection activities and a small number of operational staff. Operational traffic numbers will also be dependent on any operational issues with the Scheme. Therefore, movements are not anticipated to have a material effect on the transport network and receptors, and therefore, no further assessment will be required.

Construction Control Measures

3.9.58 The control measures listed in Table 3.9.8 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP and a constituent Construction Traffic Management Plan (CTMP) and their implementation will be monitored by National Grid.

Table 3.9.8 Construction control and monitoring measures for Traffic and Transport

Potential receptor and/or impact	Control, enhancement and monitoring measures
Site access and security	<p>Site access control:</p> <ul style="list-style-type: none"> A Traffic Marshal will be appointed to control access to and from the site where required and ensure drivers have been through the site induction process. Appropriate security fencing will be established around the site including compounds, works areas and areas used for the storage of plant and machinery and hazardous substances. These will be subject to regular inspection. Where necessary, CCTV will be installed within construction areas. Remote cameras will be installed at compounds for security purposes when items of value are left, with permanent CCTV being installed at the primary compound. Access to working areas will be restricted to approved personnel only, with the Site Supervisor to monitor and manage traffic and site visitors.
Pedestrian, severance, amenity, fear and intimidation – Personnel and visitor access and safety	<p>Security gates will be used to ensure that only authorised personnel and deliveries can enter and will remain closed at all other times on access to the work area (gates within the site may remain open).</p> <p>Safe pedestrian access routes between car parking locations, access points, work areas, site offices and welfare facilities will be provided.</p> <p>Where pedestrian and vehicle routes interact, appropriate crossing points and segregation will be provided.</p>

Potential receptor and/or impact	Control, enhancement and monitoring measures
	<p>Personnel requiring access to the site for reasons other than carrying out physical construction work will be treated as a site visitor. All visitors will be granted access by appointment only and must in all cases be authorised by a senior manager at the site and be required to attend a site induction session to maintain health and safety.</p> <p>All visitors, except for authorised collection or delivery drivers, shall always be the responsibility of the permanent pass holder whilst on-site and must sign in at security.</p> <p>Visitors must always use the pedestrian walkways and access gates provided for safe and easy access to site office.</p> <p>Compounds will be segregated into PPE and non-PPE areas. Personnel will not be allowed access into PPE areas without the appropriate equipment as per construction standards.</p>
HGV environmental effects including road users, accidents and safety, residents and air/noise quality	<p>HGV booking:</p> <ul style="list-style-type: none"> • A booking system (Delivery Management System) will be used to ensure deliveries to the sites will be spread across the whole day where possible. • Delivery vehicle dwell times will be kept to a minimum; vehicle engines will also be turned off to reduce noise and air pollution. Appropriate traffic management including clear and visible construction works signage will be implemented and used when/where required; this will be submitted by the Contractor prior to commencement, as requested by RMBC. Banksman will also be in position as and when required. <p>HGV emissions:</p> <ul style="list-style-type: none"> • All vehicles used in the construction of the Scheme will be to Euro standard V class or better
Seamless flow of movement, together with safety and security on-site	<p>Traffic Marshall:</p> <ul style="list-style-type: none"> • Trained personnel (Traffic Marshal) will be in place at key locations when necessary, during the construction of the Scheme.
Parking and loading	<p>Appropriate loading/unloading and parking areas for construction vehicles will be designated to avoid the need for parking or waiting on the highway.</p> <p>Upon arrival to the site compound, all deliveries will report to the coordinated delivery contact. This will be communicated to all suppliers and subcontractors at their site induction for all new drivers.</p> <p>Whilst on-site, the delivery operation will be controlled by a trained Traffic Marshal, from the point of guiding a vehicle to its designated off-loading area to guiding the vehicle back onto the Local Road Network. Both the Traffic Marshal and drivers will follow relevant safety procedures and operate the same signalling systems.</p>

Potential receptor and/or impact	Control, enhancement and monitoring measures
	<p>Adequate parking will be provided to ensure that the safety and efficient operation of the public highway is not reduced. At no time will construction personnel, including contractors and suppliers, be authorised to park outside of the Scheme boundary, including on the public highway, unless prior permission has been granted by either the relevant landowner or the LHA.</p> <p>On-site parking will be managed to ensure safety of all personnel. Parking terms and regulations will be clearly displayed using signage displayed in the immediate vicinity of the parking provision.</p>
Road safety	<p>Suitable space within the works site will be provided for all vehicles to park, unload and manoeuvre, therefore enabling all egressing vehicles to exit onto the access road in a forward-facing direction. Reversing onto any public highway will not be permitted.</p> <p>A 'Near Miss' reporting system will be implemented for all highways incidents. The Contractor will ensure that all accidents and near misses are recorded within this system and that drivers are instructed to report all issues recorded through the system. Any accidents or near misses involving vehicles travelling to/from the site will be recorded, investigated, and reported internally and to the client referring specific incidents to the LHA as deemed necessary.</p> <p>The Contractor will retain records of all incidents (e.g. speeding and driver hours) and submit to the relevant authorities upon request. If emerging issues are identified, the Contractor and the LHA will initiate discussions with relevant stakeholders.</p>
Ensuring the construction routes are adequate for ALL deliveries	<p>ALL deliveries:</p> <ul style="list-style-type: none"> • Constraints along the construction route have been identified, which includes constrained widths, sharp turns, conflict with street furniture, and constrained junction geometry. Based on the outcome of the route appraisal, Swept Path Analysis at each of the 'pinch points' to inform mitigation measures that may be required. • As highlighted in the CTMP all components have been identified as transportable using the local road network. Depending on a type and size of the equipment component, the following measures for abnormal loads could be required: <ul style="list-style-type: none"> – marker boards; – escort vehicles; – police escort; – appropriate notice; – speed restriction; and – additional lights. <p>Discussions with LHA/National Highways to be undertaken regarding ALL Strategy and required permissions.</p>

Potential receptor and/or impact	Control, enhancement and monitoring measures
Road condition – ensure that the surface of the highway altered for the Scheme remains in good repair and safe for the public traffic using the highway	<p>Road condition surveys:</p> <ul style="list-style-type: none"> Each access point to the Local Road Network by any access road or track used by the Scheme will be inspected. These inspections shall take place before first use, regularly during use and following final use, to ensure that the surface of the highway altered for the Scheme remains in good repair and safe for the public traffic using the highway. Any repairs that are required to maintain the altered highway throughout the construction period will be carried out in a timely manner. Regular inspections will be carried out in all locations where the works corridor passes over a public highway, private road, or PRoW. These will be recorded, and remedial action will be taken to remove any dirt and debris resulting from construction operations. Any damage to the surface will be scheduled for repair at the earliest opportunity. Wheel washing/dry rumble When leaving the CDM construction site, all vehicles exiting the site will be checked and cleaned if required prior to using the Local Road Network. If required, a road sweeper will be utilised to further ensure that the Local Road Network remains safe and clean of debris.
Accidents and safety	<p>Tipper covers:</p> <ul style="list-style-type: none"> It is expected that all tippers importing or removing loose material will be covered if required and it is the responsibility of the Traffic Marshal to ensure vehicles do not leave site without the appropriate covers. Any vehicles arriving to site without appropriate covers will be reported immediately to ensure the supplier is informed and appropriate action taken.
Ensuring vehicles comply to minimise impact on road users and the public	<p>Vehicle identification:</p> <ul style="list-style-type: none"> Vehicles dedicated to the Scheme long-term, i.e. staff cars and Site Supervisor commercial LGVs, will also be inducted and their registrations stored on record. If the public have any issues with the vehicles travelling to/from Site, they will be able to report this to a free phone line, which will then be investigated. <p>Information packs:</p> <ul style="list-style-type: none"> Information packs will be provided to all Contractors, which will form part of the contractual agreement between the Contractors and National Grid. The information pack may contain the details of the following CTMP requirements: <ul style="list-style-type: none"> site induction; HGV restrictions; construction routes;

Potential receptor and/or impact	Control, enhancement and monitoring measures
	<ul style="list-style-type: none"> – non-compliance guidance; – complaints procedure; – CTMP protocols and indications required for all Contractors including a code of good practice; – guidance on standard communication procedures between Contractors and Site; and – CTMP contacts (emergency and non-emergency). • Information packs and communication details will be shared with relevant local planning authorities and LHAs ahead of any construction works. • Information packs to provide details on potential hazard locations along construction route, e.g. locations where vulnerable road users will be on or crossing the construction route. • All construction HGVs will adhere to the designated construction traffic routes to and from the site. • Appropriate road signs warning all road users of the site access/egress and of construction HGVs turning in and out of the site will be provided. • Appropriate signage will be provided where PRowS connect to the designated construction routes and at connections to adjoining PRowS to warn users of an increased presence of HGVs on the local highway network. • Appropriate signage will also be provided where PRowS are temporarily closed/diverted. • Appropriate warning signage of pedestrians and cyclists in the road ahead or crossing the road ahead to be provided where required.
Sustainable travel – manage and improve the way employees travel to, from and during work	<p>Staff Travel Plan</p> <ul style="list-style-type: none"> • Based on the construction personnel numbers, it is not considered necessary to produce a travel plan for the Scheme. • Notwithstanding the above, if deemed possible and appropriate, construction teams will be transported to the site from local accommodation or agreed pick-up points in personnel transport vans. These vans will only be parked on-site within the defined working areas, and only while construction staff are on-site during work hours. Outside of working hours there will be no parking of personnel vans on-site.

Operational Control Measures

- 3.9.59 No operational control measures have been identified for Traffic and Transport within the land required to construct the Scheme or study area.

3.10 Agriculture and Soils

Introduction

- 3.10.1 This section details the Agriculture and Soils baseline conditions and the environmental appraisal of the potential Agriculture and Soils impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are set out to reduce or avoid these impacts.
- 3.10.2 This section should be read in conjunction with Appendix A, Long lane New Overhead Lines Glossary and Abbreviations, Appendix B, Methodology, Appendix D, Long Lane New Overhead Lines Drawings; and Appendix H, Long Lane New Overhead Lines Agricultural Land Classification (ALC) Report.

Study Area

- 3.10.3 The study area comprises approximately 47.40ha of agricultural land, 0.68ha of non-agricultural land for a total area of 48.12ha.

Consultation

- 3.10.4 No consultation specific to Agriculture and Soils and the Scheme has been undertaken.

Baseline

Land Use

- 3.10.5 Aerial imagery indicates that the land use across the land required to construct the Scheme is predominantly a mixture of arable agriculture and grassland with hedgerows forming field boundaries, along with some small parcels of broadleaf woodland. The overhead lines also cross the following roads: M1, A630, Long Lane, and A618.

Topography and Relief

- 3.10.6 Available Ordnance Survey (OS) mapping indicates that topography within the land required to construct the Scheme is undulating, with elevations ranging from approximately 27-74m AOD. Elevations are generally lower in the west and centre of the land required to construct the Scheme, reflecting the floodplain associated with river valleys, and rise towards the south and east/north east.

Flooding

- 3.10.7 Government long-term flooding risk service information (Environment Agency, 2024) was consulted to assess the flooding risk of the land required to construct the Scheme. Areas of low, medium and high flood risk have an annual probability of flooding of 0.1-1%, 1-3.3% and >3.3%, respectively.

- 3.10.8 Mapped flood risk is concentrated in the western and central parts of the land required to construct the Scheme, particularly around the M1 corridor and the lower-lying land associated with the River Rother, Whiston Brook and Ulley Brook.
- 3.10.9 Areas of high flood risk are primarily along watercourse corridors and lowest lying parts of the floodplain. These are most apparent around the River Rother to the east of the A630/M1 junction, along Whiston Brook to the north of the M1, and along parts of Ulley Brook to the south east. Areas of medium flood risk typically bound and extend high-risk. Areas of low flood risk occur around the outer margins of the mapped floodplain and in localised areas associated with field drains, topographic depressions and minor drainage features. The remainder of the land required to construct the Scheme has very low flood risk.

Geology

- 3.10.10 The BGS Geology Viewer (BGS, 2025) indicates that bedrock geology within the land required to construct the Scheme is mapped as the Mercia Mudstone Group. This is described as Triassic sedimentary mudstone bedrock of fluvial, lacustrine and marine origin, formed between approximately 247.1 and 201.3 million years ago.
- 3.10.11 Superficial deposits are mapped across parts of the land required to construct the Scheme. The Holme Pierrepont Sand and Gravel Member is mapped across parts of the north east of the land required to construct the Scheme towards Fledborough. These deposits comprise Quaternary-age sand and gravel of fluvial origin formed between 11,800 and 126,000 years ago.
- 3.10.12 Alluvium is mapped within fields adjoining the River Trent, with a small section extending east towards Skegby along watercourses at field margins. These deposits comprise Quaternary-age clay, silt, sand and gravel of fluvial origin.

Previous Agricultural Land Classification (ALC)

- 3.10.13 Predictive ALC mapping (Defra, 2026) at a scale of 1:250,000, shows land the land required to construct the Scheme to be predominantly mapped as Subgrade 3a, with areas of Subgrade 3b along Ulley Brook and an area of Grade 4 within the north eastern section of the overhead lines.
- 3.10.14 Predictive ALC Mapping for the Scheme is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.10.1.
- 3.10.15 There is no published detailed ALC mapping available for the Scheme.

Previous Soil Survey Data

- 3.10.16 Available national soil survey information (Cranfield, 2026) indicates that the soils across the Scheme are characterised by three main Soil Associations. Along the west and south west of the Scheme the soils comprise the Conway Association, comprising deep stoneless fine silty and clayey soils variably affected by groundwater and the Bardsey Association, comprising slowly permeable seasonally wet acid loamy soils over silty and clayey soils. Soils of the Rivington 1 Association, which comprises well drained coarse loamy soils over sandstone, lie within the southern and north eastern parts of the Scheme.

- 3.10.17 National Soil Associations Mapping for the Scheme is shown in Appendix D, Long Lane New Overhead Lines Drawings, Figure 3.10.2.

Climatological Data

- 3.10.18 The climate data required for the ALC assessment are provided for 5km intersections of the British National Grid by the Meteorological Office. Interpolated data for the Scheme is set out in Table 3.10.1. The climate data covers the centre of the land required to construct the Scheme and the areas of highest and lowest elevation.

Table 3.10.1 Climatological data of the land required to construct the Scheme

Parameter	Values		
British National Grid Reference	SK 435 892	SK 448 880	SK 443 862
Altitude	28	46	61
Average annual rainfall (AAR) (mm)	624	634	641
Accumulated temperature (AT0) (mm)	1402	1381	1364
Moisture deficit for wheat (mm)	109	107	105
Moisture deficit for potatoes (mm)	101	98	95
Field Capacity Days (FCD)	139	140	141

Agricultural Land Classification (ALC)

- 3.10.19 No detailed ALC surveys have been undertaken for the Scheme. In the absence of detailed survey data, predictive ALC mapping indicates that, where soils remain undisturbed and representative of natural conditions, the majority of the Scheme is Subgrades 3a and 3b. Subgrade 3a (good quality) is Best and Most Versatile (BMV) agricultural land where grades 3b (moderate quality) and grade 4 (poor quality) are not.
- 3.10.20 The distribution of grades across the Scheme, based on Predictive mapping, are as follows:
- ALC Grade 3a accounts for 30.1ha (62.5%);
 - ALC Grade 3b accounts for 17.2ha (35.8%);
 - ALC Grade 4 accounts for 0.14ha (0.3%); and
 - Non-Agricultural Land accounts for 0.68ha (1.4%).
- 3.10.21 A detailed ALC survey will be undertaken pre-construction, to inform a Soil Management Plan (SMP). Where practicable, data will be incorporated into this EAR report, where any updates will be made accordingly.

Potential Construction and Operational Impacts

- 3.10.22 Construction and maintenance (during operation) of the Scheme has the potential to affect agricultural land quality and soil resources. Potential impacts include topsoil and subsoil stripping, soil compaction and structural degradation from construction traffic, soil profile mixing, drainage disruption, and localised loss of agricultural land associated with infrastructure.
- 3.10.23 During operation, land taken temporarily will have been reinstated and returned to agricultural use, whilst land taken permanently will remain out of agricultural use. As the construction phase will account for both the temporary and permanent losses, there would be no further permanent losses of agricultural land as a result of operation.
- 3.10.24 Periodic maintenance activities during operation of the Scheme has the potential to affect agricultural land quality and soil resources, particularly where temporary land take, vegetation clearance, access, excavation, storage of materials, vehicle movements and reinstatement are required. Following pre-construction ALC surveys, a detailed SMP will be prepared and implemented during construction and operation to protect agricultural land quality and soil resources, ensuring that good practice measures are implemented for soil stripping, stockpiling and reinstatement. The SMP will be developed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009) and the Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings (Institute of Quarrying, 2021).
- 3.10.25 Following implementation of the SMP and associated good practice soil management measures, effects on agricultural land quality and soil resources during construction and operation are expected to be negligible and no significant residual effects are anticipated.

Control Measures

- 3.10.26 The control measures listed in Table 3.10.2 will be applied during the construction and maintenance (during operation) phases of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP and their implementation will be monitored by National Grid.

Table 3.10.2 control and monitoring measures for Agriculture and Soils

Potential receptor and/or impact	Control, enhancement and monitoring measures
Agricultural land quality and soil resources	<p>A detailed Soil Management Plan (SMP) will be prepared following planning consent and implemented throughout the construction and operational phases of the Scheme. The SMP will be developed in accordance with the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009) and the Institute of Quarrying Good Practice Guide for Handling Soils in Mineral Workings (Institute of Quarrying, 2021).</p> <p>The SMP will set out measures for the identification, stripping, handling, storage and reinstatement of topsoil and subsoil resources, including the management of soil stockpiles, prevention of soil compaction and soil profile mixing, protection of soil resources during wet weather, maintenance and reinstatement of agricultural drainage systems, and supervision and monitoring requirements during earthworks and reinstatement.</p> <p>A detailed Agricultural Land Classification (ALC) survey will be undertaken prior to construction to inform the SMP and identify the distribution of Best and Most Versatile (BMV) agricultural land within the land required to construct Scheme.</p> <p>During operation, any maintenance activities requiring temporary land take, access by vehicles or plant, excavation, vegetation clearance, material storage or reinstatement will be undertaken in accordance with the SMP. Areas disturbed during maintenance works will be reinstated to their pre-existing agricultural condition and land use as soon as practicable following completion of the works.</p>

3.11 Socioeconomics and Human Health

Introduction

- 3.11.1 This section details the Socioeconomics and Human Health baseline conditions and the environmental appraisal of the potential Socioeconomics and Human Health impacts associated with the construction and operation of the Scheme. Where potential environmental impacts are identified, relevant control measures are prescribed to reduce or avoid these impacts.
- 3.11.2 This section should be read in conjunction with Section 3.3 Landscape and Visual, Section 3.5 Air Quality, Section 3.6 Water Resources and Flood Risk, Section 3.7 Land and Ground Conditions, Section 3.8 Noise and Vibration, Section 3.9 Traffic and Transport, Appendix A, Long Lane New Overhead Lines Glossary and Abbreviations, Appendix B, Methodology.

Study Area

- 3.11.3 The study area for Socioeconomics and Human Health comprises:
- Socioeconomics: This assessment is based on the local planning authority the Scheme falls within, Rotherham metropolitan borough. For comparative purposes, Yorkshire and The Humber have also been identified;
 - Community facilities: This assessment is based on a 500m buffer from the land required to construct the Scheme;
 - Business, recreation and tourism assets: This assessment is based on a 500m buffer from the land required to construct the Scheme; and
 - Human health: This assessment is based on the local planning authority the Scheme falls within, Rotherham metropolitan borough.

Consultation

- 3.11.4 No further consultation specific to Socioeconomics and Human Health and the Scheme has been undertaken.

Baseline

Socioeconomics

- 3.11.5 There were 276,595 residents Rotherham metropolitan borough in 2024 (Nomis, 2026), 61.3% of whom were aged 16 to 64 (i.e. working age), which is marginally lower than the Yorkshire and The Humber (62.3%), and Great Britain (62.8%) averages.
- 3.11.6 The proportion of the working age population that was economically active between January and December 2025 in the borough (73.9%) is lower than the regional (76.8%) and national (79.2%) averages. Job density (i.e., the ratio of total jobs to population aged 16 to 64) data for Rotherham in 2024 (0.65) is significantly lower than the region of Yorkshire and The Humber (0.80) and the national (0.85) average in 2024. This indicates a lower availability of employment opportunities within the region.
- 3.11.7 There were estimated to be 100,000 jobs available in Rotherham in 2024, of which 69.0% were full-time and 32.0% were part-time. The dominant industries in Rotherham are “wholesale and retail trade; repair of motor vehicles and motorcycles” (16.0%), “human health and social work activities” (15.0%) and “manufacturing” (14.0%). The proportion of employees in “manufacturing” in Rotherham (14.0%) is nearly twice as high as the national average (7.3%).
- 3.11.8 The Indices of Multiple Deprivation (IMD) show that Rotherham was ranked 53 out of the 296 local authorities in England in 2025, indicating the District is one of the more deprived local authorities (Ministry of Housing, Communities and Local Government, 2019).

Community Facilities

- 3.11.9 There are no community facilities within the land required to construct the Scheme.
- 3.11.10 There are a number of community facilities located 500m from the land required to construct the Scheme. These include:
- Whiston Parish Hall is located approximately 450m north east of the land required to construct the Scheme; and
 - Newman School is located approximately 500m north east of the northern most of the land required to construct the Scheme.

Business, Recreation and Tourism Assets

- 3.11.11 Whiston Meadows LWS lies within land required to construct the Scheme. There are public accesses to the LWS located immediately north and west of the land required to construct the Scheme.
- 3.11.12 There are no other business, recreation or tourism assets within the land required to construct the Scheme. However, there are seven receptors located within 500m of the land required to construct the Scheme. These include:
- Burnt Wood LWS (a recreational site located directly adjacent to the land required to construct the Scheme);
 - Revel Wood LWS (a recreational site located directly adjacent to the land required to construct the Scheme);
 - Whiston allotment – Whiston Vale Site (a private allotment located approximately 80m north of the land required to construct the Scheme);
 - Whiston Forge Cricket Club (a sports club located approximately 110m east of the land required to construct the Scheme);
 - Ulley Country Park LWS (a recreational site located approximately 140m south east of the land required to construct the Scheme);
 - Whiston allotment – Barfield Site (a private allotment located approximately 165m north east of the land required to construct the Scheme);
 - Canklow Meadows Industrial Estate (an industrial estate located approximately 380m north west of the land required to construct the Scheme); and
 - Whiston Parish Church Cricket Club (a sports club located approximately 470m east of the land required to construct the Scheme).
- 3.11.13 There are a number of recreational paths within the land required to construct the Scheme. These include:
- Nine PRowWs (Treeton Footpath no.1, Treeton Footpath no.2, Treeton Footpath no.4, Whiston Footpath no.7, Whiston Footpath no.9, Whiston Footpath no.10, Whiston Footpath no.12, Whiston Footpath no.13 and Whiston Footpath no.15); and
 - National Cycle Network (NCN) No.6;
 - Doorstep Walk Number 15 (RMBC, N/a); and

- Rotherham Round Walk long distance path (The Long Distance Walkers Association, 2026).

3.11.14 There are a further 14 footpaths and one bridleway located within 500m of the land required to construct the Scheme.

Human Health

- 3.11.15 The Department of Health and Social Care (2025) data shows that the majority of health indicators are categorised as significantly worse in Rotherham when compared to the England averages, for example life expectancy at birth for males and females; under 75 mortality rate from all causes; and adults and children classified as overweight or obese. The health indicators in Rotherham that are significantly better than England are related to estimated dementia diagnosis rate (aged 65 and older); new Sexually Transmitted Infections diagnoses and Tuberculosis incidence.
- 3.11.16 Rotherham has a higher rate of patients recorded for emergency hospital admission for chronic obstructive pulmonary disease (149.4 when compared to the regional rate of 118.2). The area also has a higher number of the population with limiting long-term illness or disability (22.0% when compared to the regional rate of 18.8%).
- 3.11.17 Further baseline of the wider environment relevant to health related environmental change is presented in Section 3.3 Landscape and Visual, Section 3.5 Air Quality, Section 3.6 Water Resources and Flood Risk, Section 3.7 Land and Ground Conditions, Section 3.8 Noise and Vibration, and Section 3.9 Traffic and Transport.

Potential Construction Impacts

Socioeconomics

- 3.11.18 Due to the nature of the Scheme, the capital cost of the Scheme will be relatively small in scale when compared with other large scale energy developments. The extent to which construction expenditure will be directed into the local economy cannot be determined until construction contracts have been awarded. Drawing on experience from similar energy developments, it is anticipated that the majority of the construction expenditure will be allocated to specialist Contractors, who may not be based in the local area. Therefore, the potential residual impacts on the local economy and local employment are anticipated to be temporary negligible beneficial.

Community Facilities

- 3.11.19 There are no community facilities within the land required to construct the Scheme.
- 3.11.20 Newman School and Whiston Parish Hall are located approximately 500m from the land required to construct the Scheme. However, the community facilities are situated at a distance from the land required to construct the Scheme where no land-take or disruption to direct access are anticipated. Therefore, no impact on community facilities is anticipated during construction.

Business, Recreation and Tourism Assets

- 3.11.21 The Whiston Meadows LWS lies within the land required to construct the Scheme. There are alternative access points to reach the north eastern extent of the LWS which falls beyond the land required to construct the Scheme. However, those areas within the land required to construct the Scheme will be temporarily closed due to safety reasons. Given that there will be severance in place with partial closure during the construction of the overhead lines, a temporary medium adverse impact is anticipated during construction.
- 3.11.22 Although there are a few businesses, recreation and tourism assets within 500m of the land required to construct the Scheme, they are situated at a distance from the land required to construct the Scheme with no land-take or disruption to direct access anticipated during construction. Therefore, no impacts on assets located beyond the land required to construct the Scheme are anticipated during construction.
- 3.11.23 There is the potential that PRowS will require diversion and potential temporary closure depending on the works required during construction for the recreational routes that fall within the land required to construct the Scheme:
- Temporary closure with diversion will be provided for eight PRowS (i.e., Treeton Footpath no.1, Treeton Footpath no.2, Treeton Footpath no.4, Whiston Footpath no.7, Whiston Footpath no.9, Whiston Footpath no.10, Whiston Footpath no.13 and Whiston Footpath no.15) located within the land required to construct the Scheme due to safety reasons during construction, where practicable. Given that diversion will be in place, adequate accessibility will be maintained during construction, a temporary low adverse residual impact is anticipated.
 - Whiston Footpath no.12 will remain open during construction with the proposed separation between public and construction users. Given that adequate accessibility will be maintained during construction, a temporary negligible adverse residual impact is anticipated.
 - NCN No.6 will remain open during construction on the existing alignment along Pleasley Road. Given that access will be maintained at its current alignment, no impact is anticipated during construction.
 - Temporary closure with diversion will be provided for sections of the Doorstep Walk Number 15 and Rotherham Round Walk long distance path that falls within the land required to construct the Scheme due to safety reasons during construction, where practicable. Given that diversion will be in place, adequate accessibility will be maintained during construction, a temporary low adverse residual impact is anticipated.
- 3.11.24 There are a further 14 footpaths and one bridleway located within 500m of the land required to construct the Scheme. As these recreational routes are situated at a distance from the land required to construct the Scheme, and no direct impacts are predicted, no disruption to access is anticipated. Therefore, no impacts on recreational routes located beyond the land required to construct the Scheme are anticipated during construction.

Human Health

3.11.25 There are potential construction impacts on human health from the changes in the wider health determinants. These comprise the following:

- **Employment and income:** The potential employment opportunity will be limited due to the nature of the Scheme. These limited employment gains are likely to result in induced employment from the potential limited additional spending from the construction workers. This is likely to result in beneficial health outcomes, such as improved mental health and provide opportunities for social contact. Therefore, a temporary negligible beneficial impact is anticipated on human health associated with employment and income.
- **Physical activity:** PRoWs and other recreational routes provide opportunities for walking for recreation. The construction of the Scheme is anticipated to result in temporary access disruption and diversion to some recreational routes. The diversion may increase journey length and may discourage physical activities. Section 3.3 Landscape and Visual also identified major to negligible adverse effects on visual amenity of PRoW users. Provided that relevant construction information will be provided to the public, especially PRoW users, to ensure transparency and facilitate a clear understanding of the proposed works, public expectations on views of a small section of PRoW network are expected to be effectively managed. Therefore, a temporary low adverse residual impact is anticipated on human health associated with physical activity.
- **Visual amenity:** Visual amenity contributes to individuals' perceptions of their surroundings, influence mental wellbeing, stress levels, and overall quality of life. Section 3.3 Landscape and Visual identified potential major to moderate adverse effects on residential properties within 2km due to the potential views of the construction activity. The duration of construction activities is likely to be short-term and not anticipated to result in extensive change in mental wellbeing. Therefore, a temporary low adverse residual impact is anticipated on human health associated with mental wellbeing and quality of life.
- **Air quality:** Section 3.5 Air Quality identified a negligible residual impact on construction dust from construction activities. These include a potential for a low to medium risk of dust to human health from demolition, whilst the potential risk of earthworks, construction and trackout is negligible to low. The potential decrease in air quality may adversely affect the population with preexisting respiratory and cardiovascular disease. Given that mitigation will be in place to reduce construction dust, the potential change in air quality due to the Scheme will be within the statutory standards, resulting in a temporary negligible adverse residual impact on human health associated with respiratory and cardiovascular disease.
- **Water quality and flood risk:** Section 3.6 Water Resources and Flood Risk identified a negligible to low impact on water environment following the implementation of mitigation measures. Given that mitigation will be in place to reduce pollution and risk of flooding, the potential change due to the Scheme will be within the statutory standards, resulting in a temporary negligible adverse impact on human health associated with water quality and flood risk.

- **Land quality:** Section 3.7 Land and Ground Conditions identified a neutral to slight adverse effect from potential exposure to contaminated dust and contamination. Given an appropriate CEMP and Construction Phase (Health and Safety) Plan will be implemented to reduce exposure to contaminated land, the potential change due to the Scheme will be within the statutory standards, resulting in a temporary negligible adverse impact on human health associated with exposure to contamination.
- **Noise:** Changes in noise levels from construction work and construction traffic could lead to impacts on mental wellbeing. Section 3.8 Noise and Vibration identified a potential temporary impact from construction activities and construction traffic, plant and equipment. The Noise and Vibration assessment suggests that the potential impact will be temporary and transitory in nature. An CEMP will be implemented to reduce or avoid any potential impact that may occur during the construction of the Scheme. Given that mitigation will be in place to appropriately manage and reduce construction noise levels, the potential change due to the Scheme will be within the statutory standard, resulting in a temporary negligible adverse impact on human health associated with noise levels.
- **Transport mode, access and connections:** Section 3.9 Traffic and Transport identified temporary negligible adverse impact from the increase in construction traffic. Given that mitigation (i.e., CEMP and CTMP) will be in place to manage construction traffic, there will be a temporary negligible adverse impact on human health associated with access.

Potential Operational Impacts

Socioeconomics

- 3.11.26 Due to the nature of the Scheme, the proposed overhead lines will not require any operators to be permanently on Scheme. Therefore, no impact is anticipated on the local economy and local employment during operation.

Community Facilities

- 3.11.27 There are no community facilities within the land required to construct the Scheme.
- 3.11.28 Newman School and Whiston Parish Hall are located approximately 500m from the land required to construct the Scheme. As the community facilities are situated at a distance from the land required to construct the Scheme and the nature of the Scheme being overhead lines, no disruption to access is anticipated. Therefore, no impact on community facilities is anticipated during operation.

Business, Recreation and Tourism Assets

- 3.11.29 The proposed overhead lines will be located above the Whiston Meadows LWS. Therefore, no access disruption is anticipated during operation. Therefore, no impact on accessibility on the LWS is anticipated during operation.
- 3.11.30 Although there are a few businesses, recreation and tourism assets within 500m of the land required to construct the Scheme, they are situated at a distance from the land required to construct the Scheme with no land-take or disruption to direct access

anticipated during operation. Therefore, no impact on assets located beyond the land required to construct the Scheme is anticipated during operation.

3.11.31 Access to recreational routes within the land required to construct the Scheme will be reinstated during operation, no disruption to access is anticipated. Therefore, no impacts on recreational routes within the land required to construct the Scheme are anticipated during operation.

3.11.32 Although there are further 15 PRowWs located within 500m of the land required to construct the Scheme, these PRowWs are situated at a distance from the land required to construct the Scheme, no disruption to access is anticipated. Therefore, no impact on recreational routes located beyond the land required to construct the Scheme is anticipated during operation.

Human Health

3.11.33 There are potential operational impacts on human health from the changes in the wider health determinants. These comprise the following:

- **Physical activity:** Access to recreational route within the land required to construct the Scheme will be reinstated during operation, no disruption anticipated during operation. Section 3.3 Landscape and Visual identified potential minor to moderate beneficial effects, and negligible to moderate adverse effects on visual amenity for recreational route users in Years 1 and 15 (when mitigation planting reaches maturity). Furthermore, changes to visual amenity affecting the PRowW network in the area are not anticipated to significantly discourage the overall pursuit of physical activity. Therefore, a permanent low beneficial and low adverse residual impact is anticipated on human health associated with physical activity.
- **Visual amenity:** Section 3.3 Landscape and Visual identified potential negligible to minor adverse and minor beneficial effects during operation on residential properties in Years 1 and 15. Whilst there are likely to be individuals who experience adverse mental health and wellbeing impacts associated with visual change, this is not anticipated to be at a significant scale or disproportionately affect health deprived populations. Furthermore, there are existing overhead lines at the current setting. Therefore, a permanent negligible adverse impact is anticipated on human health associated with mental wellbeing and quality of life.
- **Radiation and mental health:** The overhead lines may pose a perception risk associated with EMFs to impact mental health. The Scheme is located south and east of major settlements, in a rural area. However, given that the Scheme will be designed and operated in full compliance with established guidelines related to EMF including the International Commission on Non-Ionizing Radiation Protection (ICNIRP) Guidelines, potential EMF impacts will be effectively mitigated and the Scheme will be in compliance with health and safety standards. Therefore, a permanent negligible adverse impact on human health associated with radiation and mental health is anticipated.
- **Water quality and flood risk:** Section 3.6 Water Resources and Flood Risk identified that water quality of the surrounding environment is not expected to be impacted during operation. Hence, neutral impact on human health associated with water quality and flood risk is anticipated.

- **Land quality:** Section 3.7 Land and Ground Conditions identified a negligible impact from potential the risk of contaminant infiltration during operation. Therefore, a temporary negligible adverse impact on human health associated with exposure to contamination.
- **Noise:** Section 3.8 Noise and Vibration identified a potential negligible impact from the Scheme during operation. Therefore, a permanent negligible adverse impact on human health associated with noise is anticipated.

Construction Control Measures

- 3.11.34 The control measures listed in Table 3.11.1 will be applied during the construction phase of the Scheme. National Grid is committed to implementing the identified control measures to reduce or avoid any potential impacts that may occur during the construction of the Scheme. The control measures will be included in the CEMP, and their implementation will be monitored by National Grid.

Table 3.11.1 Construction control and monitoring measures for Socioeconomics and Human Health

Potential receptor and/or impact	Control, enhancement and monitoring measures
Temporary direct, indirect and induced employment opportunities from the construction works (beneficial)	Not required.
Temporary access disruption on businesses, recreation and tourism assets (adverse)	Where businesses, recreation and tourism assets cannot be avoided and fall within the land required to construct the Scheme, access to the affected assets will be maintained where practicable. In the case of closures, appropriate access arrangements, including temporary diversion will be provided. Advance notice signage will be erected regarding route diversion. The notice boards will be erected prior to and throughout the construction phase.
Temporary access disruption to recreational routes (adverse)	Where recreational routes cannot be avoided and fall within the land required to construct the Scheme, access to the routes will be maintained where practicable. In the case of closures, temporary diversion will be provided. Any recreational route closures or diversions during the construction phase will be clearly communicated and advertised prior to and throughout the construction phase. Diversionary routes will be equipped with appropriate signage to minimise route uncertainty and ensure clarity for users. The proposed recreational routes diversion will follow best practices to ensure safety of users.

Potential receptor and/or impact	Control, enhancement and monitoring measures
Temporary changes in visual amenity (adverse)	<p>Adoption and implementation of the CEMP and relevant construction practices (such as appropriately sited construction areas, suitable control of construction lighting away from surrounding countryside and implementing tree protection measures) as detailed in Section 3.3.</p> <p>Relevant construction information will be provided to the public to ensure transparency and facilitate a clear understanding of the proposed works, which could assist in managing public expectations effectively.</p>
Temporary changes in air quality (adverse)	<p>A Dust Management Plan will be produced and implemented by the Contractors as detailed in Section 3.5 to minimise dust emissions from the excavation of materials, general construction activities and the movement of construction vehicles.</p>
Temporary changes in water quality and flood risk (adverse)	<p>Adoption of mitigation measures, including best practice pollution prevention measures, dewatering operations in accordance with relevant permits, appropriate disposal of waste water, the implementation of sustainable drainage, Environmental Emergency Response Plan, best practice in material storage, best practice for water consumption, and attenuated water discharges outlined in Section 3.6.</p>
Temporary changes in potential exposure to contaminated dust (adverse)	<p>Adoption of best practice construction measures as detailed in CEMP and Section 3.7, as well as Construction Phase (Health and Safety) Plan.</p>
Temporary changes in noise levels (adverse)	<p>A Best Practicable Means approach will be adopted to reduce noise and vibration impacts on residents.</p>
Temporary changes in traffic (adverse)	<p>A CEMP and CTMP will be produced and implemented by the Contractor to minimise disruption from the construction traffic, including the compliance with safety measures, adherence to the designated construction route to and from the site, implementation of emergency access protocols, minimisation of debris deposits onto public roads implementation of appropriate road signs warning, and implementation of site induction covering travelling through the construction route.</p>

Operational Control Measures

- 3.11.35 The measures listed in Table 3.11.2 will be implemented during the operational phase of the Scheme and the appraisal has been undertaken assuming these measures are in place.

Table 3.11.2 Operational control and monitoring measures for Socioeconomics and Human Health

Potential receptor and/or impact	Control, enhancement and monitoring measures
Permanent change in visual amenity along recreational routes (adverse)	Vegetation retainment and enhancement have been considered. The Scheme has been designed to minimise potential impacts upon existing vegetation and maintain existing screening.
Permanent changes in mental health due to perceived risk from EMFs (adverse)	The Scheme will be designed and operated in full compliance with established guidelines related to EMFs. Adherence to these guidelines will ensure that potential EMF impacts are effectively mitigated, maintaining compliance with health and safety standards.

3.12 Cumulative Impacts

Introduction

- 3.12.1
- This section of the EAR reports the results of the appraisal of the intra-project and inter-project cumulative impacts associated with the construction and operation of the Scheme. There are two types of cumulative impacts, both of which are considered within this EAR:

 - intra-project cumulative impacts: the combination of individual impacts from the Scheme on a particular receptor; and
 - inter-project cumulative impacts: the combination of impacts from several developments, in this case, and the Scheme together with other reasonably foreseeable developments, which individually might have negligible or slight impacts, but when considered together could create a moderate or major cumulative impact.

Potential Cumulative Impacts

Intra-Project Impacts

- 3.12.2
- The outcome of the Stage 1 – Screening Assessment is presented in Table 3.12.1 below which summarises whether a sensitive receptor or group of receptors experiences more than one type of residual impact. Sensitive receptors or receptor groups have been identified based on professional judgement.
- 3.12.3
- The following topics were identified as having no residual impacts during construction or operation, following implementation of control and mitigation measures, and have therefore been scoped out of further intra-project impact assessment:

 - ecology;
 - air quality; and
 - noise and vibration.

Table 3.12.1 Summary of the interaction between common receptors

Receptor									
Table notes:									
M+ – Moderate or above impact									
NM – minor or negligible impact									
	Landscape and Visual	Cultural Heritage and Archaeology	Water Resources and Flood Risk *no operational impacts	Land and Ground Conditions *no operational impacts	Traffic and Transport *no operational impacts	Agriculture and Soils* *no operational impacts	Socioeconomics and Human Health		
Construction									
Regional Landscape Character: LCA 5C – Coalfield Tributary Valleys – Canklow	NM								
Regional Landscape Character: LCA 6 – Rother Valley Floor	M+								
Local Landscape Character	M+								
Residential receptors off the A618, including Guilthwaite Nurseries, Guilthwaite Cottage, High Winds, The Barn House and Guilthwaite Grange (RV02)	M+								
Residential properties within the Spa Farm estate, including Spa Farm, Spa House and two cottages (RV09)	M+								
Residential properties along the urban fringe of Whiston (RV04)	M+								
Whiston Footpath no.10 (RV05)	M+								
Whiston Footpath no.12 (RV03)	M+								

Receptor										
Table notes: M+ – Moderate or above impact NM – minor or negligible impact		Landscape and Visual	Cultural Heritage and Archaeology	Water Resources and Flood Risk *no operational impacts	Land and Ground Conditions *no operational impacts	Traffic and Transport *no operational impacts	Agriculture and Soils* *no operational impacts	Socioeconomics and Human Health		
Treeton Footpath no.1 (RV06 and RV07), Treeton Footpath no.4 (RV09) and Whiston Footpath no.7 (RV05)	M+									
Long Lane and the M1	NM									
A630 Rotherway and Haworth Lane (RV08)	NM									
Pleasley Road (RV01, RV02 and RV03)	NM									
Blue Man's Bower (SM1)			NM (beneficial)							
Whiston Conservation Area (CA1)			NM							
Listed buildings LB12 and LB13			NM							
Heritage assets 12 and 31			NM							
Heritage asset 41			NM (beneficial)							
Water quality of surface water receptors				NM	NM					
Hydromorphology of Whiston Brook, River Rother and Ulley Brook				NM						
Water resource/supply				NM						
Groundwater				NM	NM					

Receptor Table notes: M+ – Moderate or above impact NM – minor or negligible impact		Landscape and Visual	Cultural Heritage and Archaeology	Water Resources and Flood Risk *no operational impacts	Land and Ground Conditions *no operational impacts	Traffic and Transport *no operational impacts	Agriculture and Soils* *no operational impacts	Socioeconomics and Human Health
Agricultural land quality							NM	
Bole Hill and roads used for construction						NM		
Employment								NM (beneficial)
Whiston Meadows LWS								M+
PRoWs (i.e., Treeton Footpath no.1, Treeton Footpath no.2, Treeton Footpath no.4, Whiston Footpath no.2, Whiston Footpath no.7, Whiston Footpath no.9, Whiston Footpath no.10, Whiston Footpath no.13, Whiston Footpath no.15, Whiston Footpath no.12)								NM
Doorstep Walk Number 15 and Rotherham Round Walk								NM
Human health								NM
Operation								
Regional Landscape Character: LCA 5C – Coalfield Tributary Valleys – Canklow		NM						
Regional Landscape Character: LCA 6 – Rother Valley Floor		NM (beneficial)						

Receptor										
Table notes: M+ – Moderate or above impact NM – minor or negligible impact		Landscape and Visual	Cultural Heritage and Archaeology	Water Resources and Flood Risk *no operational impacts	Land and Ground Conditions *no operational impacts	Traffic and Transport *no operational impacts	Agriculture and Soils* *no operational impacts	Socioeconomics and Human Health		
Residential receptors off the A618, including Guilthwaite Nurseries, Guilthwaite Cottage, High Winds, The Barn House and Guilthwaite Grange (RV02)		NM								
Residential properties within the Spa Farm estate, including Spa Farm, Spa House and two cottages (RV09)		NM								
Residential properties along the urban fringe of Whiston (RV04)		NM (beneficial)								
Whiston Footpath no.10 (RV05)		NM (beneficial)								
Whiston Footpath no.12 (RV03)		M+								
Treeton Footpath no.1 (RV06 and RV07), Treeton Footpath no.4 (RV09) and Whiston Footpath no.7 (RV05)		M+ (beneficial)								
Long Lane and the M1		NM (beneficial)								
A630 Rotherway and Haworth Lane (RV08)		NM (beneficial)								
Pleasley Road (RV01, RV02 and RV03)		NM								

Receptor									
Table notes:									
M+ – Moderate or above impact									
NM – minor or negligible impact									
	Landscape and Visual	Cultural Heritage and Archaeology	Water Resources and Flood Risk *no operational impacts	Land and Ground Conditions *no operational impacts	Traffic and Transport *no operational impacts	Agriculture and Soils* *no operational impacts	Socioeconomics and Human Health		
Blue Man's Bower (SM1)		NM (beneficial)							
Heritage assets 12 and 31		NM							
Heritage asset 41		NM (beneficial)							
Human health							NM		

- 3.12.4 As outlined in Table 3.12.1, during construction, three receptor groups (surface water, groundwater and PRowWs) have the potential to experience more than one type of residual impact. Table 3.12.2 details the intra-project cumulative impacts on these receptors during construction.

Table 3.12.2 Appraisal of intra-project cumulative impacts

Receptor	Discipline	Residual Impact	Intra-project cumulative impact and mitigation
Surface water	Water Resources and Flood Risk	The hydromorphology of the Ulley Brook could be affected by excess silt entering channels. This risk will be mitigated during construction. The Scheme is considered to have a low to negligible impact.	The Ulley Brook could be affected by excess silt entering channels as well as the potential for accidental spillages of oils, chemicals, cement and fuels during the construction phase. Following the implementation of a CEMP, no intra-project cumulative impact is anticipated.
	Land and Ground Conditions	There is the potential for accidental spillages of oils, chemicals, cement and fuels from the movement of construction traffic and the storage of chemicals affecting Ulley Brook. The overall level of effect is assessed to be slight adverse to neutral.	
Groundwater	Water Resources and Flood Risk	There are potentially historical mines in the study area, which influence the local hydrological regime. There is considered to be a low to negligible impact overall on water environment receptors during construction.	Groundwater could be affected by excess silt entering channels as well as the potential for accidental spillages of oils, chemicals, cement and fuels during the construction phase. Following the implementation of a CEMP, no intra-project cumulative impact is anticipated.
	Land and Ground Conditions	There is the potential for accidental spillages of oils, chemicals, cement and fuels from the movement of construction traffic and the storage of chemicals affecting groundwater. The overall level of effect is assessed to be slight adverse to neutral.	
PRowWs	Landscape and Visual	The scale of construction activity, coupled with close proximity and limited intervening vegetation to screen views, will result in a major to moderate adverse level of effect, albeit temporary in nature for Whiston Footpath no.10 and a major to moderate adverse level of effect for Whiston Footpath no.12,	During construction, users of the PRow will experience a change in visual amenity and access. Through the implementation of a CEMP and alternative access, no intra-project

Receptor	Discipline	Residual Impact	Intra-project cumulative impact and mitigation
		Treeton Footpath no.1, Treeton Footpath no.4 and Whiston Footpath no.7, albeit temporary in nature.	cumulative impacts are anticipated.
	Socioeconomics and Human Health	Given that a diversion will be in place and adequate accessibility will be maintained during construction, a temporary low adverse residual impact is anticipated for nine PRowS (i.e., Treeton Footpath no.1, Treeton Footpath no.2, Treeton Footpath no.4, Whiston Footpath no.2, Whiston Footpath no.7, Whiston Footpath no.9, Whiston Footpath no.10, Whiston Footpath no.13 and Whiston Footpath no.15) and a temporary negligible adverse residual impact for Whiston Footpath no.12.	

Inter-Project Impacts

- 3.12.5 Based on the defined approach in Appendix B, Methodology, the following committed developments listed in Table 3.12.3 below have been considered within this assessment of inter-project cumulative impacts. These committed developments have been shown in, Appendix D Long Lane New Overhead Line Drawings, Figure 3.12.1.

Table 3.12.3 Short-list of committed developments

Reference	Name of committed development	Status	Distance from the land required to construct the Scheme	Description of the committed development
1	Whitestone Net Zero Ltd	Pre-application	Overlap	A Solar Farm generating station with an estimated capacity of up to 750MW and connecting to the National Grid Brinsworth Substation. The development comprises of solar photovoltaic (PV) modules, an associated Battery Energy Storage System, onsite cabling, a collector substation and satellite substations,

Reference	Name of committed development	Status	Distance from the land required to construct the Scheme	Description of the committed development
				and other associated and ancillary development.
2	Canklow Regulator off Rotherway Canklow (RB2023/0484)	Granted	0.4km west	Demolition of 2 No. existing buildings and regulator gate, construction of new regulator gate, crane pad and compound with new control building with associated infrastructure, relocation of generator container on new concrete slab and erection of security fencing and lighting and EV charging point
3	Land to north west of Worry Goose Lane (RB2024/0104)	Proposed to committee	1.3km north east	Reserved matters application (details of internal access, landscaping, layout, scale, & appearance) for the erection of 450 dwellinghouses (reserved by outline permission RB2019/0552)
4	Moorgate Road, Moorgate Rotherham S60 3AR (RB2020/1591)	Granted	1.15km north	Application for full planning permission for residential development to include the demolition of existing unlisted buildings, the erection of 170 dwellings and the conversion of 4 existing buildings to create 27 dwellings with associated landscaping
5	Canklow Service Station, West Bawtry Road Brinsworth (RB2023/0725)	Granted	1.4km north west	Demolition of all buildings and erection of 24 hour roadside services, comprising of petrol filling station with ancillary retail and Class E (a) food outlet, including 19 car parking spaces (1 disabled, 4 electric charging bays and 8 pump island spaces), cycle parking and a jet wash bay
6	Land off Morthen Lane, Morthen (RB20205/0714)	Proposed to committee	2km north east	Construction, operation, and subsequent decommissioning of a renewable energy park, comprising ground mounted solar photovoltaic (PV) together with associated infrastructure including inverters, substation compound, cabling, access tracks, fencing, and landscaping.
7	Land off Warden Street/Castle	Granted	1.98km north west	Construction of new Day Centre (Use Class E(f)). Construction of 6no.

Reference	Name of committed development	Status	Distance from the land required to construct the Scheme	Description of the committed development
	Ave/Rother View Road Canklow (RB2024/0156)			blocks of dwellings, comprising 1no. seven bedroom adult care unit (Use Class C2), 1no. block of 2no. two bed flats, 1no. four bedroom dormer bungalow, and 3no. blocks of 4no. two bed apartments (all use Class C3), along with associated external works comprising service roads, car park, and gardens
8	Land south of West Bawtry Road, Whiston (RB2025/1420)	Proposed to be delegated	60m north	Outline planning application for the construction of up to 170 dwellings with associated landscaping, open space, drainage infrastructure and associated works (all matters reserved except access from Long Lane)
9	Land at Long Lane Whiston (RB2025/1468)	Granted	Overlap	Erection of a new 400kV Gas Insulated Switchgear (GIS) substation including gantries, internal access roads, a GIS building, parking, drainage, emergency diesel generator, lighting and CCTV, permanent access road from Long Lane, earthworks, landscaping and biodiversity enhancement, and fencing and the permanent realignment of Whiston Footpath 10

- 3.12.6 In addition to the above inter-project committed developments, there is an additional Great Grid Upgrade project to consider, the Chesterfield to High Marnham Project, which largely comprises the construction of two new 400kV substations, one at land off Calow Lane, Chesterfield and one on land north of High Marnham. Due to the distance between the Scheme and the Chesterfield to High Marnham Project, the intervening topography and the nature of the Scheme, no inter-project impacts are anticipated.
- 3.12.7 Table 3.12.4 below outlines the conclusions of the qualitative evaluation of the inter-project impacts associated with the Scheme. This appraisal has been undertaken using professional judgement and environmental information relating to the committed developments available at the time of the appraisal.
- 3.12.8 The following topics have been scoped out of further inter-project assessment as they were identified as having no residual impacts during construction or operation, following the implementation of control and mitigation measures:

- ecology;
- air quality; and
- noise and vibration.

3.12.9 Agriculture and soils is scoped into the inter-project assessment for the construction phase. Agriculture and soils has been scoped out of further assessment for the operational phase as there are no residual operational impacts.

Landscape Future Baseline

- 3.12.10 The future landscape and visual baseline is anticipated to include a considerable amount of infrastructure development, predominantly in the form of solar farms and associated battery storage facilities.
- 3.12.11 The scale of these developments is likely to result in a reduction in landscape sensitivity and magnitude of change, which will result in a potentially lower overall landscape effect.
- 3.12.12 It is possible that this (and other) development may introduce additional visual receptors (i.e. an increased number of residents close to the land required to construct the Scheme), which could result in potentially heightened adverse visual effects overall, however it is assumed that any proposed development within close proximity to the Scheme would incorporate its own visual mitigation measures.

Traffic and Transport

- 3.12.13 Cumulative impacts relating to traffic and transport are set out in Section 3.9.

Table 3.12.4 Inter-project cumulative impacts

Committed development	Inter-project cumulative impacts
Construction	
1	<p>Landscape and Visual:</p> <p>The committed development is a large-scale scheme that would be a dominant feature in the wider landscape. According to the Landscape and Visual chapter of the committed development Environmental Statement (Whitestone Net Zero Ltd, 2025), the construction phase is anticipated to have a moderate to major adverse impact to the local landscape. Following the implementation of CEMPs and best practice measures for each scheme, an inter-project impact on landscape during construction is anticipated. This is as a result of increased construction activity, workers compounds and partially completed structures throughout construction. During construction, there is anticipated to be a moderate to major adverse impact to visual amenity for sensitive receptors, including residential properties and PRow users (Whitestone Net Zero Ltd, 2025). As such, it is anticipated that there will be an inter-project cumulative visual amenity impact during the construction phase.</p> <p>Cultural Heritage and Archaeology:</p> <p>During construction, the committed development is anticipated to have a negligible to minor adverse impact to the setting of designated and non-designated heritage assets. Blue Man’s Bower (SM1) is anticipated to experience a minor to moderate impact during construction of the committed development. Following the implementation of the CEMP, it is anticipated that there will be an inter-project cumulative visual amenity impact to Blue Man’s Bower during the construction phase, and the remaining heritage assets will experience no inter-project cumulative impacts.</p> <p>Water Resources and Flood Risk:</p> <p>Flooding associated with the committed development is considered to be negligible, following the implementation of a CEMP (Whitestone Net Zero Ltd, 2025). As such, with the implementation of a CEMP, it is anticipated that there will be no inter-project cumulative water and flood risk impact during the construction phase.</p> <p>Land and Ground Conditions:</p> <p>During construction of the committed development, a negligible impact to land and ground conditions is anticipated. As such, with the implementation of a CEMP, it is anticipated that there will be no inter-project cumulative land and ground conditions impact during the construction phase.</p>

Committed development	Inter-project cumulative impacts
	<p>Socioeconomics and Human Health:</p> <p>The committed development is likely to generate temporary employment during construction, and is anticipated to have a minor beneficial impact to the local economy (Whitestone Net Zero Ltd, 2025). As such, no inter-project cumulative socioeconomic impact is anticipated.</p>
2	<p>Due to the small scale of the committed development, and the intervening topography between the Scheme and the committed development, it is deemed unlikely that there will be any inter-project cumulative impacts during the construction.</p>
3	<p>Landscape and Visual:</p> <p>During construction, there is the potential for the committed development to impact the surrounding landscape through an increase in construction noise, traffic and the presence of machinery and plant. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.</p> <p>Cultural Heritage and Archaeology:</p> <p>The committed development has the potential to impact the setting of heritage assets during construction. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>Should the construction programme for the committed development and the Scheme overlap, there is the potential for pollution from construction activities that would affect groundwater and surface water receptors. With the implementation of a CEMP for both schemes and a drainage strategy for the committed development, this is expected to cause no inter-project cumulative impact.</p> <p>Land and Ground Conditions:</p> <p>During construction, there is the potential for pollution to groundwater as a result of the committed development and the Scheme. Provided that the CEMP is appropriately implemented for each scheme, it is anticipated that there will be no inter-project cumulative impact during the construction phase.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impact during the construction phase.</p>

4

Landscape and Visual:

During construction, there is the potential for the committed development to impact the surrounding landscape through an increase in construction noise, traffic and the presence of machinery and plant. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Cultural Heritage and Archaeology:

The committed development has the potential to impact the setting of heritage assets during construction. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Water Resources and Flood Risk:

The committed development is located within Flood Zone 1 and a Flood Risk Assessment and Drainage Strategy was produced to ensure no increase in flood risk to the wider catchment. As such, it is anticipated that there will be no inter-project impacts during construction.

Land and Ground Conditions:

During construction, there is the potential for pollution to groundwater as a result of the committed development and the Scheme. Provided that the CEMP is appropriately implemented for each scheme, it is anticipated that there will be no inter-project cumulative impact during the construction phase.

Socioeconomics and Human Health:

The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impact during the construction phase.

5

Landscape and Visual:

During construction, there is the potential for the committed development to impact the surrounding landscape through an increase in construction noise, traffic and the presence of machinery and plant. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Cultural Heritage and Archaeology:

The committed development has the potential to impact the setting of heritage assets during construction. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Water Resources and Flood Risk:

The committed development is located within Flood Zone 1 and a Drainage Strategy Report (Goodson Associates, 2023) has been produced to minimise flood risk. As such, with the implementation of a CEMP, it is anticipated that there will be no inter-project cumulative water and flood risk impact during the construction phase.

Land and Ground Conditions:

The Phase I/II Environmental Site Assessment (Intelligent Ground Remediation, 2022) and the Drainage Strategy Report (Goodson Associates, 2023) concluded that there is a moderate risk to groundwater receptors as a result of the committed development during construction. There is anticipated to be a low risk to human health during construction. Following the implementation of a CEMP and best practice measures, no inter-project cumulative impact is anticipated.

Socioeconomics and Human Health:

The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impact during the construction phase.

6

Landscape and Visual:

During construction, there is the potential for the committed development to impact the surrounding landscape through an increase in construction noise, traffic and the presence of machinery and plant. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Cultural Heritage and Archaeology:

The committed development has the potential to impact the setting of heritage assets during construction. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Water Resources and Flood Risk:

The committed development is located within Flood Zone 1. Careful site selection and incorporation of SuDS, including a swale into the drainage system, ensures flood risk is minimised on and off site. As such, it is anticipated that there will be no inter-project impacts during construction.

Land and Ground Conditions:

Site assessment and strategic planning appropriately address potential risks. Following the implementation of a CEMP and best practice measures, no inter-project cumulative impact is anticipated.

Committed development	Inter-project cumulative impacts
	<p>Socioeconomics and Human Health:</p> <p>The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impact during the construction phase.</p>
7	<p>Landscape and Visual:</p> <p>During construction, there is the potential for the committed development to impact the surrounding landscape through an increase in construction noise, traffic and the presence of machinery and plant. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.</p> <p>Cultural Heritage and Archaeology:</p> <p>The committed development has the potential to impact the setting of heritage assets during construction. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>The committed development is located within Flood Zone 1. Incorporation of drainage tanks and SuDS, including porous drives and parking spaces, ensures flood risk is minimised on and off site. As such, it is anticipated that there will be no inter-project impacts during construction.</p> <p>Land and Ground Conditions:</p> <p>Site assessment concluded a need for remediation. Remediation, foundation design and the drainage design are proposed to address risks from contamination, ground gas and surface water runoff. Following the implementation of a CEMP and best practice measures, no inter-project cumulative impact is anticipated.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impact during the construction phase.</p>
8	<p>Landscape and Visual:</p> <p>During construction, there is the potential for the committed development to impact the surrounding landscape through an increase in construction noise, traffic and the presence of machinery and plant. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.</p>

Cultural Heritage and Archaeology:

The committed development has the potential to impact the setting of heritage assets during construction. Following the implementation of a CEMP, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts are anticipated.

Water Resources and Flood Risk:

Should the construction programme for the committed development and the Scheme overlap, there is the potential for pollution from construction activities that would affect groundwater and surface water receptors. With the implementation of a CEMP for both schemes and a drainage strategy for the committed development, this is expected to cause no inter-project cumulative impact.

Land and Ground Conditions:

During construction of the committed development, there is the potential for risk as a result of land and ground conditions. Provided that the CEMP is appropriately implemented for each scheme, it is anticipated that there will be no inter-project cumulative impact during the construction phase.

Socioeconomics and Human Health:

The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impact during the construction phase.

9

The committed development overlaps with the Scheme.

Landscape and Visual:

The committed development is centred within the Scheme, and within the vicinity of the existing Brinsworth substation and associated infrastructure. Following the implementation of CEMPs, it is anticipated that there will be an inter-project landscape impact during construction, but this will be temporary and limited to the construction phase.

Regarding visual amenity, it is anticipated that there will be a visual amenity inter-project cumulative impact during the construction phase.

Cultural Heritage and Archaeology:

Following the mitigation measures set out in this EAR and the CEMP, it is anticipated that there will be no inter-project cumulative impacts during construction.

Water Resources and Flood Risk:

The construction programme for the committed development and the Scheme will overlap and there is the potential for pollution from construction activities to affect groundwater and surface water receptors. With the implementation of a CEMP

Committed development	Inter-project cumulative impacts
	<p>for both of the schemes and a drainage strategy for the committed development, this is expected to cause no inter-project cumulative impacts.</p> <p>Land and Ground Conditions:</p> <p>During construction, there is the potential for pollution to groundwater as a result of the committed development and the Scheme. Provided that the CEMP is appropriately implemented for both schemes, no inter-project cumulative impacts for land and ground conditions are anticipated.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development is likely to generate temporary small-scale employment during the construction phase, similar to the Scheme. As such, it is anticipated that there will be no inter-project cumulative impacts on the local economy during construction. Following the implementation of a CEMP for each of the committed development and the Scheme, it is anticipated that there will be no inter-project cumulative impacts during construction.</p> <p>Agricultural Land and Soils:</p> <p>As a result of the construction activities affecting agricultural land during the construction of the committed development and the Scheme, inter-project cumulative impacts are anticipated.</p>
Operation	
1	<p>Landscape and Visual:</p> <p>During operation, LCA 6 (Rother Valley Floor) is anticipated to experience a minor adverse impact in Year 1 and Year 15 as a result of the committed development (Whitestone Net Zero Ltd, 2025). Following the implementation of landscape designs, it is anticipated that there will be an inter-project cumulative impact on LCA 6 during operation.</p> <p>No impact to LCA 5C (Coalfield Tributary Valleys – Canklow) is anticipated as a result of the committed development. As such, no inter-project cumulative impacts to LCA 5C are anticipated during operation. During Year 1 and Year 15 of the committed development, a negligible impact is anticipated for sensitive Lreceptors in proximity to the Scheme. Recreational users of PROWs and bridleways are anticipated to experience a minor adverse impact in Year 1 and Year 15 as a result of the committed development. As such, no inter-project cumulative impact to visual amenity is anticipated during the operational phase.</p> <p>Cultural Heritage and Archaeology:</p> <p>During operation of the committed development, it is expected that there will be a minor to moderate impact to the screening of designated heritage assets, and no effect to the screening of non-designated heritage assets (Whitestone Net Zero Ltd, 2025). Blue Man’s Bower (SM1) is anticipated to experience a minor to moderate impact as a result of the operation of the</p>

Committed development	Inter-project cumulative impacts
	<p>committed development. As such, it is anticipated that there will be an inter-project cumulative visual amenity impact to Blue Man's Bower during the operational phase, and the remaining heritage assets will experience no inter-project cumulative impacts during operation.</p> <p>Water Resources and Flood Risk:</p> <p>A negligible impact to water resources and flood risk is anticipated during operation of the committed development (Whitestone Net Zero Ltd, 2025). As such, no inter-project cumulative impact to water resources and flood risk is anticipated during operation.</p> <p>Land and Ground Conditions:</p> <p>The committed development is expected to have a negligible impact to groundwater and soils during the operational phase. As such, no inter-project cumulative impact to land and ground conditions is anticipated during operation.</p> <p>Socioeconomics and Human Health:</p> <p>Due to the nature of the committed development, operational staff numbers are anticipated to be minimal. As such, no inter-project cumulative impacts on socioeconomics and human health are anticipated.</p>
2	<p>Due to the small scale of the committed development, and the intervening topography between the Scheme and the committed development, it is deemed unlikely that there will be any inter-project cumulative impacts during operation.</p>
3	<p>Landscape and Visual:</p> <p>The committed development will have adverse impacts to the local landscape and visual amenity which will likely decrease by Year 15. Following the implementation of the landscape design, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts to landscape and visual amenity are anticipated.</p> <p>Cultural Heritage and Archaeology:</p> <p>The committed development has the potential to impact the setting of heritage assets during operation. Following the implementation of the landscape design, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts to cultural heritage are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>There is the potential that the committed development may increase flood risk in the surrounding catchment area. Following the implementation of the drainage strategy for the committed development, and the FRA and for the Scheme, no inter-project cumulative impacts are anticipated during operation.</p> <p>Land and Ground Conditions:</p>

Committed development	Inter-project cumulative impacts
	<p>During operation, it is deemed unlikely that there are any aspects of the committed development that would lead to inter-project cumulative impacts.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development will have limited socioeconomic impacts during operation due to its nature. As such, no inter-project cumulative impacts on socioeconomics and human health are anticipated.</p>
4	<p>Landscape and Visual:</p> <p>The committed development will have adverse impacts to the local landscape and visual amenity which will likely decrease by Year 15. Following the implementation of the landscape design and a Landscape Management Plan (Rotherham Borough Council, 2021), and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts to landscape and visual amenity are anticipated.</p> <p>Cultural Heritage and Archaeology:</p> <p>The committed development has the potential to impact the setting of heritage assets during operation. Following the implementation of the landscape design, and in consideration of the distance and intervening topography between the committed development and the Scheme, no inter-project cumulative impacts to cultural heritage are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>The committed development is located within Flood Zone 1 and a Flood Risk Assessment and Drainage Strategy was produced to ensure no increase in flood risk to the wider catchment. As such, it is anticipated that there will be no inter-project cumulative impacts during operation.</p> <p>Land and Ground Conditions:</p> <p>During operation, it is deemed unlikely that there are any aspects of the committed development that would lead to inter-project cumulative impacts.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development will have limited socioeconomic impacts during operation due to its nature. As such, no inter-project cumulative impacts on socioeconomics and human health are anticipated.</p>
5	<p>Landscape and Visual:</p> <p>During operation, the committed development is deemed to be a sufficient distance from the Scheme, with intervening topography and surrounding similar land use, that no inter-project cumulative impacts to landscape and visual amenity is anticipated.</p> <p>Cultural Heritage and Archaeology:</p>

Committed development	Inter-project cumulative impacts
	<p>During operation, the committed development is deemed to be a sufficient distance from the Scheme, with intervening topography and surrounding developments, such that no inter-project cumulative impacts to the setting of heritage assets are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>The committed development is located within Flood Zone 1 and a Drainage Strategy Report has been produced to minimise flood risk. As such, it is anticipated that there will be no inter-project impacts during operation.</p> <p>Land and Ground Conditions:</p> <p>The Phase I/II Environmental Site Assessment (Intelligent Ground Remediation, 2022) and the Drainage Strategy Report (Goodson Associates, 2023) concluded that there is a moderate risk to groundwater receptors as a result of the committed development during operation. There is anticipated to be a low risk to human health during operation. Following the implementation of a drainage strategy and planning conditions, no inter-project cumulative impact is anticipated.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development will have limited socioeconomic impacts during operation due to its nature. As such, no inter-project cumulative impacts to socioeconomic and human health are anticipated.</p>
6	<p>Landscape and Visual:</p> <p>During operation, the committed development is deemed to be a sufficient distance from the Scheme, with intervening topography and surrounding similar land use, that no inter-project cumulative impacts to landscape and visual amenity is anticipated.</p> <p>Cultural Heritage and Archaeology:</p> <p>During operation, the committed development is deemed to be a sufficient distance from the Scheme, with intervening topography and surrounding developments, such that no inter-project cumulative impacts to the setting of heritage assets are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>The committed development is located within Flood Zone 1. Careful site selection and incorporation of SuDS, including a swale into the drainage system, ensures flood risk is minimised on and off site. As such, it is anticipated that there will be no inter-project impacts during operation.</p> <p>Land and Ground Conditions:</p> <p>Site assessment and strategic planning appropriately address potential risks. No inter-project cumulative impact is anticipated.</p>

Committed development	Inter-project cumulative impacts
	<p>Socioeconomics and Human Health:</p> <p>The committed development will have limited socioeconomic impacts during operation due to its nature. As such, no inter-project cumulative impacts to socioeconomics and human health are anticipated.</p>
7	<p>Landscape and Visual:</p> <p>During operation, the committed development is deemed to be a sufficient distance from the Scheme, with intervening topography and surrounding similar land use, that no inter-project cumulative impacts to landscape and visual amenity is anticipated.</p> <p>Cultural Heritage and Archaeology:</p> <p>During operation, the committed development is deemed to be a sufficient distance from the Scheme, with intervening topography and surrounding developments, such that no inter-project cumulative impacts to the setting of heritage assets are anticipated.</p> <p>Water Resources and Flood Risk:</p> <p>The committed development is located within Flood Zone 1. Incorporation of drainage tanks and SuDS, including porous drives and parking spaces, ensures flood risk is minimised on and off site. As such, it is anticipated that there will be no inter-project impacts during operation.</p> <p>Land and Ground Conditions:</p> <p>Site assessment concluded a need for remediation. Remediation, foundation design and the drainage design are proposed to address risks from contamination, ground gas and surface water runoff. No inter-project cumulative impact is anticipated.</p> <p>Socioeconomics and Human Health:</p> <p>The committed development will have limited socioeconomic impacts during operation due to its nature. As such, no inter-project cumulative impacts to socioeconomics and human health are anticipated.</p>
8	<p>Landscape and Visual:</p> <p>The landscape and visual appraisal for the committed development identified a residual adverse impact on landscape character, and visual amenity with regards to impacts on users of PRow. These impacts were not considered to be unacceptable.</p> <p>The Scheme identified residual beneficial impacts on visual amenity relating to properties along the urban fringe of Whiston to the north due to the removal of several pylons from the western extent of the Scheme. No inter-project cumulative impacts are therefore identified.</p> <p>Cultural Heritage and Archaeology:</p>

Committed development**Inter-project cumulative impacts**

No residual impacts were identified for the committed development and therefore it is considered unlikely that there will be inter-project cumulative impacts for heritage.

Water Resources and Flood Risk:

The FRA concludes that there is not a significant risk of flooding to or from the committed development. Therefore, there is unlikely to be a cumulative impact.

Land and Ground Conditions:

Further investigation and detailed design in relation to sources of contamination and ground gas will be undertaken for the committed development. During operation, it is deemed unlikely that there are any aspects of the committed development that would lead to inter-project cumulative impacts.

Socioeconomics and Human Health:

The committed development will have limited socioeconomic impacts during operation due to its nature. As such, no inter-project cumulative impacts to socioeconomics and human health are anticipated.

9

The committed development overlaps with the Scheme.

Landscape and Visual:

The committed development is centred within the Scheme, and within the vicinity of the existing Brinsworth substation and associated infrastructure. An inter-project cumulative landscape impact is anticipated during the operational phase.

It is anticipated that there will be a visual amenity inter-project cumulative impact during the operational phase.

Cultural Heritage:

Following the mitigation measures set out in this EAR, it is anticipated that there will be no inter-project cumulative impacts during the operational phase.

Water and Flood Risk:

Following the implementation of the drainage strategy for the committed development, no inter-project cumulative impacts during the operational phase are anticipated.

Land and Ground Conditions:

During operation, it is deemed unlikely that there are any aspects of the committed development that would lead to inter-project cumulative impacts.

Socioeconomics and Human Health:

During operation, there would be a small number of staff present for the committed development, which would have a limited impact on the local economy. As such, no inter-project cumulative impacts are anticipated during operation. No PRowS will be permanently affected by the Scheme. As such, no inter-project cumulative impacts are anticipated during operation.

4. Summary of Impacts and Measures

4.1 Construction Control Measures and Impacts

4.1.1 Table 4.1.1 summarises the key control, enhancement and monitoring measures, and residual impacts identified for the construction phase for each discipline as part of this EAR.

Table 4.1.1 Summary of construction control measures and impacts

Discipline	Control, enhancement and monitoring measures	Level of residual impact
Ecology	Construction will be managed by a CEMP. The CEMP will include controls around lighting, screening, vegetation retention and removal, PRow management and reinstatement.	No residual impacts.
Landscape and Visual	Construction will be managed by a CEMP. The CEMP will include controls around lighting, screening, vegetation retention and removal, PRow management and reinstatement.	There will be temporary adverse impacts on landscape and visual amenity during the construction phase.
Cultural Heritage and Archaeology	Construction will be managed by a CEMP. Traffic management measures will be managed through CTMP.	There will be temporary adverse impacts on designated and non-designated heritage assets during the construction phase.
Air Quality	Implementation of measures included in this EAR and Appendix G Construction Dust Assessment and Methodology via a Dust Management Plan.	No residual impacts.
Water Resources and Flood Risk	Construction will be managed by a CEMP including method statements and controls to protect water environment receptors, manage surface water runoff, and promote water use efficiency.	There would be a low to negligible temporary impact to water environment resources.
Land and Ground Conditions	Construction will be managed by a CEMP and a Construction Phase (Health and Safety) Plan.	There will be a negligible to neutral impact during the construction phase.

Discipline	Control, enhancement and monitoring measures	Level of residual impact
Noise and Vibration	The residual impacts of construction noise and vibration have been scoped out of this EAR on the basis that this will be mitigated through the implementation of a CEMP and due to the temporary nature of the construction impact.	Construction noise has been scoped out of this EAR and has not been assessed.
Traffic and Transport	Construction traffic will be managed by a CTMP, covering but not limited to site access control, segregation of routes, HGV booking, traffic marshalling, delivery logistics, road condition surveys, management of abnormal load deliveries, wheel washing and a staff travel plan.	There will be short-term, temporary and negligible impact during construction.
Agriculture and Soils	Implementation of an SMP and CEMP.	No residual impacts.
Socioeconomics and Human Health	Construction will be managed by a CEMP and associated management plans for dust, traffic, and health and safety.	There will be temporary low to negligible adverse impacts during the construction phase.
Cumulative Impacts	Construction will be managed by a CEMP and associated management plans, including a CTMP.	No intra-project cumulative impacts are anticipated. The following inter project cumulative impact is anticipated: Landscape and Visual (committed development 1 and 9) and Agriculture and Soils (committed development 9).

4.2 Operation Control Measures and Impacts

4.2.1 Table 4.2.1 summarises the key control, enhancement and monitoring measures, and residual impacts identified for the operation phase for each discipline as part of this EAR.

Table 4.2.1 Summary of operation control measures and impacts

Discipline	Control, enhancement and monitoring measures	Level of residual impact
Ecology	Maintenance will be managed by an Environmental Management Plan (EMP). The EMP will include controls around maintenance activities, vegetation retention and management, PRow management and reinstatement.	No residual impacts.
Landscape and Visual	Maintenance will be managed by an Environmental Management Plan (EMP). The EMP will include controls around maintenance activities, vegetation retention and management, PRow management and reinstatement.	There will be negligible adverse and minor beneficial residual impacts on landscape. There will be residual minor adverse, minor neutral, minor beneficial, moderate adverse, moderate to minor beneficial, minor to negligible beneficial and minor to negligible adverse impacts on visual amenity.
Cultural Heritage and Archaeology	None identified	No residual impacts
Air Quality	None identified	No residual impacts
Water Resources and Flood Risk	None identified	No residual impacts
Land and Ground Conditions	Implementation of the recommendations from the Jacobs 2024 GIR (Jacobs, 2025). Given the limited footprint of the infrastructure and no planned SuDS, no operational control measures are considered necessary.	No residual impacts
Noise and Vibration	None identified.	No residual impacts.
Traffic and Transport	None identified.	No residual impacts.
Agriculture and Soils	Implementation of an SMP as part of the management of maintenance works.	No residual impacts.

Discipline	Control, enhancement and monitoring measures	Level of residual impact
Socioeconomics and Human Health	None identified.	There will be low beneficial and adverse to negligible residual impacts to human health.
Cumulative Impacts	Retention and protection of existing screening vegetation.	No intra-project cumulative impacts are anticipated. The following inter project cumulative impact is anticipated: Landscape and Visual (committed development 1 and 9).

5. Planning and Policy

5.1 Introduction

- 5.1.1 This chapter of the EAR provides an overview of the legislation and planning policies applicable to the Scheme.

The Electricity Act 1989

- 5.1.2 Section 9(2) of the Electricity Act 1989 places general duties on National Grid as a licence holder:

‘to develop and maintain an efficient, co-ordinated and economical system of electricity transmission...’

- 5.1.3 The Electricity Act 1989 sets out that, with certain exceptions, consent must be obtained for installing and maintaining any electric lines above ground (i.e. overhead lines). However, Section 37 includes thresholds for electrical line installation which are considered minor works, including those less than 2km in length, less than 132kV nominal capacity and that are replacing an existing line that meets certain tests. For such minor works, an application for consent is submitted to the Secretary of State under Section 37 of the Electricity Act 1989.

- 5.1.4 In addition, Schedule 9 of the Electricity Act 1989 requires an electricity licence holder such as National Grid, when formulating proposals for new lines and other works, to:

‘(a)... have regard to the desirability of preserving natural beauty, of conserving flora, fauna and geological or physiographical features of special interest and of protecting sites, buildings and objects of architectural, historic or archaeological interest; and

(b) ...do what it reasonably can to mitigate any effect which the proposals would have on the natural beauty of the countryside or on any such flora, fauna, features, sites, buildings or objects.’

- 5.1.5 National Grid’s Stakeholder, Community and Amenity Policy, published November 2025, sets out how the company will meet the Schedule 9 duty placed upon it by the legislation.

The Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017

- 5.1.6 The EIA process for development requiring consent under Section 37 of the Electricity Act 1989 is stipulated within the Electricity Works (Environmental Impact Assessment) (England and Wales) Regulations 2017.

The Town and Country Planning Act 1990

- 5.1.7 The Town and Country Planning Act 1990 is a key piece of planning legislation which consolidates various planning laws in England and Wales. It regulates the development of land and designates local councils as the primary authorities responsible for planning decisions. Under this Act, most types of new development

will require permission from the local planning authority, who make decisions based on policy compliance and the potential impacts relevant development may have on the environment and community.

- 5.1.8 Works requiring Section 37 consent may be subject to requests for deemed planning permission from the Secretary of State (not the LPA) under s.90(2A) of the 1990 Act.

5.2 National Planning Policy

National Planning Policy Framework

- 5.2.1 The National Planning Policy Framework (NPPF), 2026 (amended on 17 February 2026) sets out the Government's planning policies for England and how these should be applied. It establishes a national framework for plan-making and decision-making, with the purpose of contributing to the achievement of sustainable development. Importantly, the NPPF is a material consideration in determining planning applications and must be taken into account alongside the statutory development plan. The NPPF guides how the proposal should be assessed in relation to key national policy themes, such as meeting infrastructure needs, protecting the natural and historic environment, ensuring good design, climate change mitigation and adaptation, sustainable transport, and supporting a resilient energy and water system. The decision-maker must weigh the development's contribution to sustainable development against any environmental or community impacts, having regard to the relevant national decision-making policies of the NPPF and using the framework as a national benchmark for what constitutes acceptable and well-planned development.

National Policy Statements

- 5.2.2 National Policy Statements (NPSs) set out national policy for Nationally Significant Infrastructure Projects. The Scheme is not a Nationally Significant Infrastructure Project, however the following NPSs contain content which remains relevant because the Scheme seeks to deliver energy transmission infrastructure.

Overarching National Policy Statement for Energy (EN-1)

- 5.2.3 NPS EN-1 references the role of the NPS and its purpose to set out the Government's policy for delivery of major energy infrastructure. NPS EN-1, in conjunction with any relevant technology specific NPS, is the primary policy for Secretary of State decision making on associated development. NPS EN-1 outlines Government policy on energy and energy infrastructure development. It acknowledges that to produce the energy required for the UK and ensure it can be transported to where it is needed, a significant amount of infrastructure is needed at both local and national scale, and further outlines the Government's commitment to reach Net Zero and meet objectives for sustainable development.

National Policy Statement for Electricity Networks Infrastructure (EN-5)

- 5.2.4 NPS EN-5 defines how the UK plans, assesses and consents major electricity network infrastructure needed for net zero. It strengthens strategic planning, simplifies need assessments, sets clear environmental and design expectations, and provides detailed guidance for both onshore and offshore transmission projects.

5.3 Local Planning Policy

5.3.1 The following local planning policy documents are relevant to the Scheme.

Rotherham Local Plan Core Strategy 2013-2028 (adopted 2014)

5.3.2 The Rotherham Local Plan Core Strategy (CS) was adopted in September 2014.

5.3.3 The CS sets out the high-level strategy and policies to guide how Rotherham will change over the next 15 years. It forms part of the Development Plan for Rotherham, alongside the Sites and Policies document (2018) and the Barnsley, Doncaster and Rotherham Joint Waste Plan (2012).

5.3.4 The Development Plan does not contain specific policies relating to the development of new substations; however, a range of policies are relevant to the Scheme.

5.3.5 The CS policies of most relevance to the Scheme are:

- CS1: Delivering Rotherham's Spatial Strategy;
- CS2: Delivering Development on Major Sites;
- CS4: Green Belt;
- CS9: Transforming Rotherham's Economy;
- CS15: Key Routes and the Strategic Road Network;
- CS19: Green Infrastructure;
- CS20: Biodiversity and Geodiversity;
- CS21: Landscape;
- CS23: Valuing the Historic Environment;
- CS24: Conserving and Enhancing the Water Environment;
- CS25: Dealing with Flood Risk;
- CS27: Community Health and Safety;
- CS28: Sustainable Design;
- CS30: Low Carbon & Renewable Energy Generation;
- CS32: Infrastructure Delivery and Developer Contributions; and
- CS33: Presumption in Favour of Sustainable Development.

Sites and Policies (2018)

5.3.6 The Sites and Policies (SP) document was adopted by RMBC on 27 June 2018 and reviewed in 2023. The document identifies development sites across the borough to meet the targets set out in the CS.

5.3.7 The SP also includes an interactive Policies Map which identifies all sites, land uses and policy designations in the borough.

5.3.8 The SP policies of most relevance to the Scheme are:

- SP 2: Development in the Green Belt;
- SP 16: Land Identified for Industrial and Business Uses;
- SP 28: Development Affecting Key Routes and the Strategic Road Network;
- SP 32: Green Infrastructure and Landscape;
- SP 33: Conserving and Enhancing the Natural Environment;
- SP 34: Sites Protected for Nature Conservation;
- SP 35: Protected and Priority Species;
- SP 36: Soil Resources;
- SP 38: Protecting Green Space;
- SP 42: Archaeology and Scheduled Ancient Monuments;
- SP 43: Conserving and Recording the Historic Environment;
- SP 47: Understanding and Managing Flood Risk and Drainage;
- SP 49: Safeguarding Mineral Infrastructure;
- SP 52: Pollution Control;
- SP 54: Contaminated and Unstable Land;
- SP 55: Design Principles;
- SP 56: Car Parking Layout;
- SP 57: Sustainable Construction; and
- SP 69: Utilities Infrastructure.

Barnsley, Doncaster and Rotherham Joint Waste Plan (2012)

- 5.3.9 The Barnsley, Doncaster and Rotherham Joint Waste Plan was adopted in March 2012.
- 5.3.10 The Joint Waste Plan set out the overall approach to managing waste across Barnsley, Doncaster and Rotherham for the 15 years after its adoption.
- 5.3.11 The relevant planning policies in the Barnsley, Doncaster and Rotherham Joint Waste Local Plan are:
 - Policy WCS1: Barnsley, Doncaster and Rotherham's Overall Strategy For Achieving Sustainable Waste Management; and
 - Policy WCS7: Managing Waste in All Developments.

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Appendix A Long Lane New Overhead Lines Glossary and Abbreviations

Appendix A

Long Lane New Overhead Lines Glossary and Abbreviations

Term	Definitions
AADT	Annual Average Daily Traffic
AAR	Average annual rainfall
AAWT	Annual Average Weekday Traffic
ALC	Agricultural Land Classification
AOD	Above Ordnance Datum
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
AT0	Accumulated temperature
ATC	Automatic Traffic Count
BAP	Biodiversity Action Plan
bgl	Below ground level
BGS	British Geological Survey
BMV	Best and Most Versatile
BTEX	Benzene, toluene, ethylbenzene, and xylenes
CA	Conservation area
CCTV	Closed-circuit television
CE	Common Era
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CTMP	Construction Traffic Management Plan
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMMO	Definitive Map Modification Order
DMRB	Design Manual for Roads and Bridges
DWS	Drinking Water Standard
EAR	Environmental Appraisal Report
ECow	Ecological Clerk of Works
eDNA	Environmental DNA

Term	Definitions
EIA	Environmental Impact Assessment
EMF	Electric and magnetic field
EPS	European Protected Species
EPSM	European Protected Species Mitigation
EQS	Environmental Quality Standards
FAR	Further assessment required
FCD	Field Capacity Days
GB	Great Britain
GIR	Ground Investigation Report
HDV	Heavy Duty Vehicle
HER	Historic Environment Record
HGV	Heavy Goods Vehicle
HoCC	Habitat of Conservation Concern
HPI	Habitats of Principle Importance
HPiE	Habitats of Principle Importance in England
HSI	Habitat Suitability Index
IAQM	Institute of Air Quality Management
IEMA	Institute of Environmental Management and Assessment
IMD	Indices of Multiple Deprivation
INNS	Invasive Non-Native Species
LAQM	Local Air Quality Management
LB	Listed building
LBAP	Local Biodiversity Action Plan
LCA	Landscape Character Assessment
LDV	Light Duty Vehicle
LGV	Light Goods Vehicle
LHA	Local highway authority
LWS	Local Wildlife Site
MAGIC	Multi-Agency Geographic Information for the Countryside
MTBE	Mineral oil, methyl tert-butyl ether
NCA	National Character Area
NO ₂	Nitrogen dioxide
OS	Ordnance Survey

Term	Definitions
PAH	Polycyclic aromatic hydrocarbon
PCB	Polychlorinated biphenyl
PM	Particulate matter
PM ₁₀	Particulate matter less than 10 micrometres in diameter
PM _{2.5}	Particulate matter less than 2.5 micrometres in diameter
PPE	Personal Protective Equipment
PRF	Potential roost feature
PRoW	Public Right of Way
PV	Photovoltaic
RMBC	Rotherham Metropolitan Borough Council
RNAG	Reasons for Not Achieving Good
RPA	Root protection area
RPE	Respiratory Protective Equipment
RV	Representative Viewpoint
SAC	Special Area of Conservation
SCC	Sheffield City Council
SMP	Soil Management Plan
SPA	Special Protection Area
SRN	Strategic Road Network
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
TCPA	Town and Country Planning Act 1990
TEMPro	Trip End Model Presentation Program
UPVC	Unplasticized polyvinyl chloride
UXO	Unexploded Ordnance
WFD	Water Framework Directive
ZoI	Zone of Influence

Appendix B

Methodology

The Great Grid Upgrade

Brinsworth to Chesterfield

Brinsworth to Chesterfield

Environmental Appraisal Report - Appendix B: Methodology

October 2026



nationalgrid

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1. Ecology Methodology

1.1 Legislation, Policy and Guidance

1.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Ecology in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies is provided below.

Legislation

1.1.2 The following key legislation is of direct relevance to the appraisal of the Scheme.

Table 1.1 Legislation

Legislation	Details
Conservation of Habitats and Species Regulations 2017 (as amended) ('Habitats Regulations')	The Habitats Regulations require authorities on behalf of the Secretary of State to maintain a list of sites which are important for either habitats or species (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) and to provide protection for these sites through designation, planning, and other controls. The Habitats Regulations make it an offence (subject to exceptions) to deliberately, kill, injure, disturb, capture, or trade in the animals listed in Schedule 2, or pick, collect, cut, uproot, destroy, or trade in the plants listed in Schedule 4. However, these actions can be made lawful through the granting of licences by the appropriate authorities (Natural England in England). Licences may be granted for several purposes (such as science and education, conservation, preserving public health and safety), but only after the appropriate authority is satisfied that there are no satisfactory alternatives and that such actions will have no detrimental effect on the favourable conservation status of the species concerned.
The Wildlife and Countryside Act 1981, as amended (WCA)	<p>The Act is the main mechanism for legislative protection of wildlife in England. It gives protection to native species (particularly threatened species), their resting places and places of shelter by making it an offence to kill, injure, take, damage, destroy, sell, or possess them (with exceptions).</p> <p>The WCA gives protection to certain species of wild plants and safeguards important habitats by making it an offence to damage or destroy certain types of designated habitats, such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs). This Act also prohibits the spread and release of certain non-native species into the wild.</p>

Legislation	Details
Protection of Badgers Act 1992	<p>Badger (<i>Meles meles</i>) and their setts are protected under the Protection of Badgers Act 1992. This protects badgers and their setts by making it an offence to:</p> <ul style="list-style-type: none"> • wilfully kill, injure, or take a badger; • damage a badger sett or any part of it; • destroy a badger sett; • obstruct access to, or any entrance of, a badger sett; and • disturb a badger when it is occupying a badger sett. <p>A licence from Natural England is required for any activity that would result in obstruction, disturbance, or closure (temporarily or permanently) of an active sett. If a main sett requires closure, mitigation must be provided by the construction of an artificial sett along with proof of uptake by badgers.</p>
Countryside and Rights of Way Act 2000	<p>The Countryside and Rights of Way Act 2000 places a duty on government departments to have regard to the conservation of biodiversity and maintain lists of species and habitats for which conservation steps should be taken or promoted, in accordance with the Convention on Biological Diversity (this duty was strengthened in the Natural Environment and Rural Communities (NERC) Act 2006. It also strengthens legal protection for species considered to be threatened under the WCA and increases powers for the protection and management of SSSIs.</p>
Natural Environment and Rural Communities (NERC) Act 2006	<p>The NERC Act places a duty upon public bodies to maintain Section 41 (S41) lists of flora, fauna, and habitats, and to consider these ecological features as a material consideration in planning. It also requires decision-makers to have regard to the conservation of biodiversity in England, when carrying out their normal functions.</p>
The Invasive Alien Species (Enforcement and Permitting) Order 2019 (the Invasive Species Order)	<p>This order strengthens the legislation in relation to widely spread species of European Union concern, requiring effective management measures to be put in place to minimise their impacts.</p> <p>A person who plants or otherwise causes to grow in the wild any specimen which is of a species of plant which is included in Part 2 of Schedule 2 is guilty of an offence.</p>
Environment Act 2021	<p>In line with the 25 Year Plan for the Environment, new development should identify and pursue opportunities for securing measurable net gains for biodiversity and for the wider environment. The Environment Act 2021 introduces a mandatory requirement for 10% biodiversity net gain for new developments to ensure that they enhance biodiversity and create new green spaces for local communities to enjoy. Integrating biodiversity net gain into the planning system will provide a step change in how planning and development is delivered. There is also a strong focus on delivering environmental net gain. This would preferably be achieved on-site, however there are options to deliver these gains off-site and this would be demonstrated via the Statutory Biodiversity Metric calculation tool.</p>

Policy

- 1.1.3 The following key planning policies are of relevance to the appraisal of the Scheme for Ecology.

National policy

- 1.1.4 The National Planning Policy Framework (NPPF) (MHCLG, 17 August 2026) sets out the Government's planning policies for England and how these are expected to be applied by Local Authorities within their Local Development Frameworks (LDF). Section 19 (Conserving and Enhancing the Natural Environment) seeks to safeguard and enhance biodiversity, geodiversity, landscapes and natural capital, support nature recovery, strengthen ecological networks and protect designated sites and irreplaceable habitats. The NPPF requires development proposals to minimise adverse effects on biodiversity and secure biodiversity net gain where applicable. It states the following:

- If significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated or as a last resort compensated for then planning permission should be refused.
- Developments affecting habitat sites, SSSI and other designated sites of importance for biodiversity must be assessed in accordance with relevant national policy safeguards.
- Development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland, and ancient or veteran trees) should normally be refused unless there are wholly exceptional reasons and a suitable compensation strategy exists.
- Developments whose primary objective is to conserve or enhance biodiversity, strengthen ecological networks and contribute to nature recovery should be incorporated into development proposals wherever possible. Opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure net gains for biodiversity.

Local policy

- 1.1.5 The following policies within the Rotherham Local Plan 2013 to 2028 (RMBC, 2018) relate to biodiversity and nature conservation:

- Policy SP 2 Development in the Green Belt:
 - Inappropriate development is, by definition, harmful to the Green Belt and should not be approved except in very special circumstances.
- Policy SP33 Conserving and Enhancing the Natural Environment:
 - Development should conserve and enhance existing and create new features of biodiversity and geodiversity value.
- Policy SP34 Sites Protected for Nature Conservation:
 - Development or changes of use on land within or outside a statutorily protected site (either individually or in combination with other developments) which would adversely affect the notified special interest features, fabric or setting of the statutorily protected site will not be permitted.

- Policy SP 35 Protected and Priority Species:
 - Planning permission for development likely to have a direct or indirect adverse impact on the protected and priority species will only be granted if they can demonstrate that there are no alternative sites with less or no harmful impacts that could be developed and that mitigation and/or compensation measures can be put in place that enable the status of the species to be conserved or enhanced.
- Policy SP 36 Soil Resources:
 - Development will be required to demonstrate the sustainable use of soils during construction and operation stages, where appropriate and to be determined in discussion with the Local Planning Authority.
- Policy SP 38 Protecting Green Space:
 - Development proposals will be required to demonstrate how any likely negative impact on the amenity, ecological value and functionality of adjacent Green Space and other Green Infrastructure within the immediate vicinity has been mitigated.
- Policy SP 41 Conservation Areas:
 - Developments are required to ensure the preservation or enhancement of the special character or appearance of Rotherham's Conservation Areas and their settings.
 - Under section 211 of the Town and Country Planning Act 1990 the Local Planning Authority must be notified six weeks before the carrying out of works to, or removal of trees in a Conservation Area that are not protected by a Tree Preservation Order unless an exception applies. This notice period gives the Authority an opportunity to consider whether to make a Tree Preservation Order on the tree or trees.

Other relevant policy

- 1.1.6 The Rotherham Local Biodiversity Action Plan (LBAP) (Rotherham Biodiversity Forum, 2012) is a document that provides a framework for work on nature and conservation at a local level. It is part of a national approach to biodiversity and identifies important species and habitats in Rotherham, giving each one an action plan to aid in their conservation.
- 1.1.7 The Birds of Conservation Concern 5 (BoCC5) defines rare and threatened bird species on two lists (Red and Amber) describing the varying levels of conservation concern for each species (Stanbury A. J., 2021; Stanbury A. J., 2024).

Guidance

- 1.1.8 The Chartered Institute of Ecology and Environmental Management (CIEEM) is the leading professional membership body representing and supporting ecologists and environmental managers in the UK. CIEEM's competency framework specifies the skills and levels of competence expected of their members working in the profession (CIEEM, 2021). All surveys and assessments have been undertaken by suitably qualified and experienced ecologists as per CIEEMs competency framework. CIEEM has developed guidelines to promote good practice in Ecological Impact Assessment

(EcIA) (CIEEM, 2018). EcIA can be used for the appraisal of projects of any scale, including the ecological component of EIA. All surveys and assessments have been made in line with the CIEEMs guidelines for EcIA.

1.1.9 All surveys were conducted following the appropriate guidelines, as follows:

- Habitat Surveys:
 - Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017)
 - UK Habitat Classification Documents V2.0 (UKHab Ltd, 2023).
- Amphibian (Great Crested Newt):
 - Great Crested Newt Habitat Suitability Index (Amphibian and Reptile Groups of the United Kingdom, 2010); and
 - Analytical and methodological development for improved surveillance of Great Crested Newt (Biggs *et al.*, 2014).
- Otter:
 - Monitoring the Otter *Lutra lutra* (Chanin, 2003).
 - The Otter Field Survey and Monitoring Handbook (2026)
- Water vole:
 - The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series) (Dean *et al.*, 2016).
- Roosting Bats:
 - Bat Conservation Trust (BCT) 'Best Practice Guidelines' 3rd edition (Collins, 2016);
 - Bat Conservation Trust (BCT) 'Best Practice Guidelines' 4th edition (Collins, 2023); and
 - Arboriculture Association Safety Guides (Arboriculture Association, 2021).
- Foraging and Commuting Bats:
 - Bat Conservation Trust (BCT) 'Best Practice Guidelines' 3rd edition (Collins, 2016);
 - Bat Conservation Trust (BCT) 'Best Practice Guidelines' 4th edition (Collins, J., 2023).
- Badger:
 - Surveying Badgers (Harris *et al.*, 1989).

1.1.10 Planning Practice Guidance (PPG) for Biodiversity Net Gain (MHCLG, 2024b) was first published on 14 February 2024 and was last updated on 1 31 July 2026. As confirmed in the PPG Biodiversity Net Gain has not been commenced for planning permissions granted through a Deemed Planning Permission and so therefore any request for Deemed Planning Permission in support of the application for Section 37 consent will not be subject to the mandatory 10% BNG condition that does attach to the TCPAs. Study Area

1.1.11 Table 1.2 summarises the search areas used for ecological receptors with regard to the appraisal of this Scheme.

Table 1.2 Ecological receptors search area

Designation	Search Area from Site
International or European statutory designated sites	Land required to construct the Scheme plus 10km
National statutory designated sites	Land required to construct the Scheme plus 2km
Other statutory designated sites Non-statutory designated sites Protected and notable species Invasive, non-native species Granted European Protected Species Mitigation (EPSM) licences	Land required to construct the Scheme plus 2km
Protected and notable habitat (including ancient woodland)	Land required to construct the Scheme plus 2km

1.2 Surveys

Desk Study

- 1.2.1 A desktop study was initially undertaken by Arcadis in March 2023 and updated in June 2026. Existing ecological information relating to the Scheme and their surroundings was obtained as part of the assessment.
- 1.2.2 The baseline conditions were informed by a review of existing available information including:
- MAGIC (Multi-Agency Geographical Information for the Countryside) website (MAGIC, 2025). The MAGIC website was used to search for any statutory designated sites of nature conservation importance within a specific radius of the Scheme boundary, (radius based upon the maximum likely predicted zone of influence) as outlined in Table 1.2.
 - Ordnance Survey (OS) mapping and aerial photography were studied to place habitats within the study area in the wider context; identify potential ecological features that may not be evident on the ground during the field survey; and identify potential barriers to animal movements (such as road networks, built development and major watercourses) (Google, 2025).
 - The Rotherham Biological Records Centre was approached to provide ecological records of protected and notable species, habitats and non-statutory designated sites within 2km of the Scheme. Protected species records from this local records centre includes Environment Agency data.

Site Survey

Habitat Survey

- 1.2.3 An Extended Phase 1 habitat survey was conducted in March 2023. An updated walkover was conducted in September 2023, November 2023, April 2024 and June 2026, to ensure the baseline conditions of the Scheme had not changed and to fill in identified gaps. The surveys followed methodology in line with the Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017). These surveys included searches of the Scheme for field signs of protected and species of principal importance (HMSO, 2006).
- 1.2.4 A UK Habitat Classification (UKHab) survey was undertaken at the same time as the Extended Phase 1 habitat survey (JNCC, 2016), in compliance with the UKHab guidance documents (UKHab Ltd, 2023). Primary habitats on Site were classified using Level 3 and Level 4 of the UKHab hierarchy.

Invasive Non-Native Species (INNS)

- 1.2.5 The INNS surveys involved surveyors walking across all areas of the Scheme and recording any evidence of INNS presence listed on Schedule 9 of Wildlife and Countryside Act 1981 (HMSO, 1981) and/or Invasive Alien Species Order 2019 (HMSO, 2019). This survey was conducted on in conjunction with the Extended Phase 1 habitat survey. Surveyors used GIS to record species, presence, location and extent of INNS.

Amphibians

- 1.2.6 The aim of the surveys was to assess waterbodies within 250m of the Scheme to determine their suitability to support great crested newt and to undertake, where appropriate, additional surveys to determine the presence/absence of great crested newt in order to inform mitigation relating to the proposed works.
- 1.2.7 Initially, ten ponds were scoped into the assessment during a review of OS Mapping (OpenStreetMap, 2023) and aerial imagery (Google, 2023) of these, six were later scoped out due to ponds found to be dry/filled in. A Habitat Suitability Index (HSI) (Amphibian and Reptile Groups of the United Kingdom, 2010) assessment was undertaken for the remaining four ponds (Biggs et al., 2014). These surveys were completed by suitably qualified Arcadis ecologists alongside the Extended Phase 1 habitat survey in June 2026.

Otter and Water Vole

- 1.2.8 Otter and Water Vole surveys were carried out alongside the initial UK Habs and Extended Phase 1 habitat surveys, using the relevant guidelines, Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series) (2016), Monitoring the Otter *Lutra lutra* (2003) and The Otter Field Survey and Monitoring Handbook (2026). The surveys were conducted to search for, record and map signs of otter and water vole (namely droppings/latrines, feeding remains, footprints, paths/runs, burrows, holts, direct sightings). A team of two surveyors walked the length of each watercourse and along the sides of the channel, recording any otter or water vole activity field signs present. Additionally, surveyors assessed the watercourse and surrounding habitats' wider suitability for both species.

Roosting Bats

- 1.2.9 An initial Ground Level Tree Assessment (GLTA) was undertaken to assess the suitability of trees to support bat roosts in 2023. An updated survey was carried out in June 2026. Trees were visually inspected from the ground initially for evidence of roosting bats including droppings, urine staining, feeding remains, with a focus on recording potential roost features (PRFs).
- 1.2.10 To note the initial GLTA undertaken in 2023 were under the Bat Conservation Trust (BCT) 'Best Practice Guidelines' 3rd edition (Collins, 2016), as these were the most up to date guidelines at the time of the survey.
- 1.2.11 Where the GLTA categorised trees as suitable to support potential roost features (PRFs), a more detailed assessment was required to re-categorise the PRFs in 2026 following the updated guidance (Collins, 2023), through a single PRF aerial inspection survey.

Commuting and foraging bats

- 1.2.12 Bat surveys were undertaken for the new 400kV Long Lane substation application and these were considered sufficient data to inform the Scheme baseline.
- 1.2.13 In accordance with the BCT Good Practice Guidelines (Collins, 2023), three nighttime bat walkovers (NBW) were undertaken. A pre-determined transect around the new 400kV Long Lane substation boundary was followed, taking full spectrum acoustic recordings using a portable Anabat Scout 1 handheld bat detectors and Echo Meter Pro and observations of any commuting and foraging bats within the Scheme in October 2023, April 2024 and June 2024.

Breeding birds

- 1.2.14 Breeding bird surveys were undertaken for the new 400kV Long Lane substation application and these were considered sufficient data to inform the Scheme baseline.
- 1.2.15 In accordance with British Trust for Ornithology (BTO) Common Bird Census methodology (Gilbert *et al.* 1998), three breeding bird surveys were completed by a suitably qualified ornithologist between March and May 2026.

Badger

- 1.2.16 Evidence of badger within, and immediately adjacent to, the Scheme were surveyed for concurrently with the Extended Phase 1 habitat survey. The identification of badger field signs followed standard methodology detailed in "Surveying Badgers" (Harris, Cresswell, & Jefferies, 1989). This included surveying for badger setts, latrine/dung pits, foraging marks, feeding signs and pathways.

1.3 Appraisal Approach

Method of Assessment

- 1.3.1 The EcIA method has followed the current applicable guidance, including the CIEEM Guidelines for EcIA (CIEEM, 2018).
- 1.3.2 The current guidance on EcIAs (CIEEM, 2018) recommends that all ecological factors that occur within a 'zone of influence' (Zoi) for a proposed development are

investigated. The ZOI is variable depending on the ecological receptors affected and is commonly decided using experience and professional judgement.

- 1.3.3 The following assessment process, which will cover all phases of the Scheme, involves:
- determining the importance of ecological features affected, through survey and/or research and with reference to available contextual information;
 - assess impacts potentially affecting important features;
 - characterise the impacts, e.g. extent, magnitude, duration, reversibility, timing and frequency; and
 - identify cumulative impacts.
- 1.3.4 The assessment of impacts should take into account the baseline conditions to allow a description of how the baseline conditions will change as a result of the Scheme and associated activities and the identification of cumulative impacts arising from the proposal and other relevant developments.
- 1.3.5 There are a large number of sites, habitats and species that provide the key focus for biodiversity conservation in the UK and Ireland, supported by policy and legislation. These provide an objective starting point for identifying the important ecological features that need to be considered. The factors which will be taken into consideration in evaluating ecological features for both habitats and species are devised following CIEEM guidelines. The following geographic frame of reference have been used to determine the importance of ecological features: International; National; Regional; County; Local and Site as set out in the CIEEM guidelines. The categories of valuation are presented in Table 1.3.

Table 1.3 Categories of valuation

Level of Importance	Example
International	<p>Habitats</p> <p>An internationally designated site or candidate site (SPA, provisional SPA, SAC, candidate SAC, Ramsar Site, Biogenetic/Biosphere Reserve) or an area that would meet the published selection criteria for designation. A viable area of habitat type listed in Annex I of the Habitats Directive, or smaller areas of such habitat, which are essential to maintain the viability of a larger whole.</p> <p>Species</p> <p>Species populations of habitat areas (such as those listed in Annex I, II or IV of the Habitats Directive or Annex I of the Birds Directive) of international importance due to relative size, rarity or quality of the feature.</p>
National	<p>Habitats</p> <p>A nationally designated site, Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Marine Nature Reserve (MNR) or a discrete area, which would meet the published selection criteria for national designation (e.g. SSSI selection guidelines). A viable area of a habitat of principal importance (e.g. ancient woodland), or of smaller areas of such habitat essential to maintain wider viability.</p>

Level of Importance	Example
	<p>Species</p> <p>Species populations or habitat areas of national importance (including legally protected or NERC Act S41 species or habitats) due to relative size, rarity or quality of the feature.</p>
Regional	<p>Habitats</p> <p>Sites that exceed the County-level designations but fall short of SSSI selection criteria. Viable areas of key habitat identified in the Regional Biodiversity Action Plan (BAP) or smaller areas of habitat essential to maintain wider viability.</p> <p>Species</p> <p>Any regularly occurring, locally significant population of a species listed as being nationally scarce, which occurs in 16 of 100 10km² squares in the UK or in a Regional BAP. A regularly occurring, locally significant population/number of a regionally important species. Sites maintaining populations of internationally/nationally important species that are not threatened or rare in the region or county.</p>
County	<p>Habitats</p> <p>Sites recognised by local authorities, e.g. Local Nature Reserves. Non-statutory designations attributed by the Local Planning Authority such as Sites of Importance for Nature Conservation (SINCs). A viable area of habitat identified in County BAP. A diverse and/or ecologically valuable hedgerow network.</p> <p>Species</p> <p>Any regularly occurring, locally significant population of a species listed in a County BAP due to regional rarity or localisation. A regularly occurring, locally significant population of a County important species. Sites supporting populations of internationally/nationally/regionally important species that are not threatened or rare in the region or county, and not integral to maintaining those populations. Sites/features scarce in the County or that appreciably enrich the County habitat.</p>
Local	<p>Habitats</p> <p>Areas of habitat that appreciably enrich the local habitat resource (e.g. species-rich hedgerows, ponds etc). Sites that retain other elements that due to their size, quality or the wide distribution within the local area are not considered for the above classifications.</p> <p>Species</p> <p>Populations/assemblages of species that appreciably enrich the biodiversity resource within the local context. Sites supporting populations of County important species that are not threatened or rare in the County and are not integral to maintaining those populations.</p>
Site	<p>Habitats</p> <p>Habitats that are only of value at the Scheme scale.</p> <p>Species</p> <p>Species that are only of value at the Scheme scale.</p>

1.4 Limitations and Assumptions

1.4.1 The following assumptions and limitations are relevant to the appraisal of ecology. Any specific limitations to the survey effort are noted within the relevant technical appendices.

- A precautionary approach has been taken in the prediction of impacts. Where there is any doubt, a species will be assumed present, and an impact will be given the higher level of significance.
- Field surveys are limited by a variety of factors which affect the presence of flora and fauna (i.e., climatic variation, season and species behaviour). A lack of evidence of a protected species during a survey does not mean that the species is absent; hence the survey also records and assesses the ability of habitats to support such species. The time frame in which the survey is implemented provides a snapshot of activity within the survey area and cannot necessarily detect all evidence of use by a species.
- It should be noted that whilst every effort has been made to provide a comprehensive description of the Scheme, no investigation can ensure the complete characterisation of the natural environment. The field survey does not constitute a full botanical survey. Plant species may have been under-recorded, unidentifiable or not visible due to the time of year the survey was carried out.
- The findings presented in the targeted species report represent those at the time of survey and reporting, and data collected from available sources. Ecological surveys are limited by factors which affect the presence of species, such as weather conditions, movement patterns and behaviour.
- Bat activity surveys and breeding bird surveys were focused on the new 400KV Long Lane substation only, however the results from these surveys still provide a baseline assessment of species present within the locale.
- Parts of the Scheme could not be assessed in updated 2026 surveys due to land access limitations. Some of these areas were previously assessed in 2023 and therefore have some data, and some small sections have a complete lack of data. In these instances the appraisal has taken a precautionary approach.

2. Landscape and Visual Methodology

2.1 Legislation, Policy and Guidance

- 2.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Landscape and Visual matters in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Legislation

International

- 2.1.2 The UK is a signatory to the European Landscape Convention (ELC) (Council of Europe, 2000) which was ratified in 2006 and became binding in the UK from 1 March 2007. The Convention is not an EU Directive, rather countries that ratify the Convention make a commitment to upholding the principles it contains within the context of their own domestic legal and policy frameworks.
- 2.1.3 There is no UK legislation specifically covering Landscape or Visual Amenity, but the spirit of the ELC is carried through in planning policy. Landscape is defined in the ELC as:
- ‘an area, as perceived by people, whose character is the result of the action and interaction of natural and / or human factors.’*
- 2.1.4 Furthermore, it recognises that all landscapes are potentially important, irrespective of location or condition – signatories acknowledge:
- ‘... that the landscape is an important part of the quality of life for people everywhere: in urban areas and in the countryside, in degraded areas as well as in areas of high quality, in areas recognised as being of outstanding beauty as well as everyday area’.*

National

- 2.1.5 The Environment Act 2021 includes the following sections that deal specifically with Landscape and Visual matters:
- Paragraphs 13–16 (in Part 6, Schedule 14, under ‘Condition of planning permission relating to biodiversity gain’).
- 2.1.6 These paragraphs lay out the mandatory biodiversity gain plan requirements and approval mechanisms, including the need to submit and have approved a landscape and habitat enhancement plan before development begins. However, biodiversity net gain has not been commenced for planning permissions granted through Deemed Planning Permission and therefore any request for Deemed Planning Permission in support of the application for Section 37 consent will not be subject to the mandatory 10% BNG condition that does attach to the TCPAs.

Policy

National

- 2.1.7 The NPPF (MHCLG, 2026) attaches importance to the character of the built environment, emphasising that developments should add to the overall quality of the area, respond to local character and history and reflect the identity of local surroundings and materials. The policies that are most relevant to landscape and views are as follows.
- 2.1.8 Section 14: Achieving well-designed places
- Policy DP3 states that development proposals should respond to their context, including the character and features of the site and its setting, so that they integrate with and enhance their surroundings. Development proposals should also create visually attractive, distinctive and characterful development and maintain a strong sense of place.
- 2.1.9 Section 19: Conserving and Enhancing the Natural Environment
- Policy N1 states that development plans should safeguard and enhance the natural environment, including landscapes, habitats and ecological networks, and steer development towards land of least environmental value where consistent with other policies in the NPPF;
 - Policy N2 states that development proposals should consider the environmental qualities of land proposed for development, including landscape character and the natural beauty of the countryside, and identify opportunities for those qualities to be conserved or enhanced; and
 - Policy N4 states that development proposals within Protected Landscapes should be limited in scale and extent and sensitively located and designed to avoid harm to their statutory purposes and special qualities. Development proposals within the setting of Protected Landscapes should also be sensitively located and designed to avoid or minimise adverse impacts

Local

- 2.1.10 The study area lies within the administrative boundary of RMBC.

Rotherham Local Plan - Adopted September 2014 - Core Strategy 2013 – 2028 (RMBC, 2014)

Core Strategy Policy CS3 – Location of New Development

- 2.1.11 Para 5.2.61 states:
- ‘National guidance also states that Planning should encourage the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value and to enhance as well as protect biodiversity, natural habitats, the historic environment and landscape and townscape character. Derelict sites often blight the areas they are in and their re-development should be a priority. Re-use of such sites also minimises the amount of countryside and other greenfield land required.’*

2.1.12 Para 5.2.67 states:

'In locating development care will be taken to minimise the loss of the best and most versatile agricultural land and opportunities to maintain and create links to green infrastructure will be taken wherever possible.'

Core Strategy Policy CS4 – Green Belt

2.1.13 Para 5.2.73 states:

'Whilst the Council must plan for future growth, it also needs to protect sensitive areas from development and ensure that the pattern of development does not have a negative impact on sustainability. This, allied to the established exceptional circumstances, forms the foundation to a Review with an overarching ambition of not causing material harm to the fundamental aims of national Green Belt policy.'

2.1.14 Para 5.2.76 states:

'In accordance with the approach being taken, where land is removed from the Green Belt for built development, the opportunity should be taken to compensate by enhancing the features and facilities of the remaining Green Belt areas in that vicinity, through the creation or improvement of existing green infrastructure: looking for opportunities to provide access; provide opportunities for sport and recreation; retain and enhance landscapes, visual amenity and biodiversity; or improve damaged and derelict land.'

Core Strategy Policy CS20 – Biodiversity and Geodiversity

2.1.15 Para 5.6.22 states:

'The aim of this policy is to provide a framework for conserving and enhancing the total natural environment resource and diversity both for its own sake and for the positive contribution it makes to Rotherham's quality of life, ecosystem service provision and sense of place.'

Core Strategy Policy CS19 – Green Infrastructure

2.1.16 Para 5.6.6 states:

'Green infrastructure is an integral part of new development and the identification and conservation of Green Infrastructure will be integral to achieving a high quality and sustainable environment. Conserving and enhancing Green Infrastructure provision will contribute to improving the conditions in which people live, work and take leisure. Green Infrastructure Strategies will provide the framework for targeted action.'

2.1.17 Para 5.6.8 states:

'Map 9 'Strategic and Local Green Infrastructure Corridors ' shows in broad terms the borough's Strategic and Local Green Infrastructure Corridors, which are summarised below in Table 9 'Strategic and Local Green Infrastructure Corridors'. This Map sets the context for the application of Policy CS19 and more detailed development management policy set out in greater detail in the Sites and Policies document.'

2.1.18 Para 5.6.9 states:

'The Strategic Corridors are those identified to be of importance through the Yorkshire & Humber Green Infrastructure Mapping Project 2010. The Anston Brook &

Sandbeck Corridor is of local significance only. Detailed descriptions for each of the Strategic Corridors, explaining the main features and functions, indicators and identified key opportunities are available from Natural England.'

Core Strategy Policy CS21 – Landscape

2.1.19 Para 5.6.54 states:

'This policy provides a positive framework for landscape in Rotherham. Most of Rotherham is currently open countryside. Protecting and managing the diverse environments is therefore a key objective of the Core Strategy. The policy approach to the protection and enhancement of the landscape in Rotherham is to continue to provide the highest level of protection to the Areas of High Landscape Value until such a time as a comprehensive Landscape Character Assessment has been prepared. Once the Landscape Character Assessment work is completed, development will be required to respect or enhance the landscape character area in which it is proposed (see the outline "Landscape Character Assessment and Landscape Capacity Study" (2009)).'

2.1.20 Para 5.6.56 states:

'This Policy includes provision for the safeguard of significant landscape features and important views. Proposals that reduce the negative visual impact of landscape detractors will be encouraged. Information on significant landscape features and landscape detractors is given in the "Landscape Character Assessment and Landscape Capacity Study (2009)". A number of assets of landscape significance in Rotherham Metropolitan Borough are recognised for other interests they contain (e.g. they may have one or more planning designations such as Local Wildlife Sites, and they may also receive statutory protection such as a Site of Special Scientific Interest). Historic assets of landscape importance in Rotherham are also recognised through the Registered Parks and Gardens designation. Further historical detail on local landscapes and townscapes is provided in South Yorkshire Archaeology Service's South Yorkshire Historic Environment Characterisation.'

Core Strategy Policy CS22 – Green Space

2.1.21 Para 5.6.77 states:

'Improvements to the quality and accessibility of open space will be achieved through developer contributions comprising S106 obligations and CIL where appropriate. It is important that the Core Strategy is flexible. The type of green space that will be appropriate for different types of development will vary. Further detail will be given in the Sites and Policies document. Partnership arrangements with local organisations including Groundwork Dearne Valley may also be explored.'

Core Strategy Policy CS28 – Sustainable Design

2.1.22 The overarching policy states:

'The design process shall take into account:

a. the topography, landforms, Green Infrastructure assets, river and canal corridors, important habitats, waterways, woodlands, other natural features and open spaces that provide opportunities for an accessible choice of shade and shelter, recognise opportunities for flood storage, wildlife and people provided by multi-functional greenspaces.

b. views and vistas to landmarks and skylines into and out of Rotherham Town Centre and across Rotherham to the surrounding countryside

c. heritage, townscape and landscape character including the height, scale, massing, density, layout, building styles and materials of the built form'

Planning Practice Guidance (PPG)

2.1.23 Planning Practice Guidance (PPG) is published alongside the NPPF (MHCLG, 2026) and adds further context in specific areas of planning policy. It is intended that the NPPF and PPG are read together.

2.1.24 The following PPG documents are considered to be of relevance to Landscape and Visual matters.

2.1.25 Natural Environment (MHCLG, 2025):

- **Landscape Character:** The PPG advises that local plans should include policies that protect and enhance the intrinsic character and beauty of the countryside. Landscape character assessments (LCAs) and sensitivity studies should inform planning decisions to ensure that developments are sensitive to the landscape setting; and
- **Valued Landscapes:** The PPG highlights that valued landscapes, particularly those with statutory designations (such as National Parks and Areas of Outstanding Natural Beauty), should be given strong protection, in line with the NPPF's requirements.

2.1.26 Design (MHCLG, 2019):

- **Context and Local Distinctiveness:** It advises that developments should be sympathetic to the local landscape and visual character, ensuring that new proposals respect the local distinctiveness and landscape context; and
- **Visual Impact:** Design guidance emphasises that proposals should minimise adverse visual impacts on both the immediate and wider surroundings. The PPG encourages using techniques such as planting, green infrastructure, and sensitive design to mitigate these effects.

South Yorkshire Green Infrastructure Strategy, March 2011 (RMBC, 2011)

2.1.27 The Green Infrastructure Strategy was prepared to present a new vision for South Yorkshire's green infrastructure and provides a framework for a programme to support local action, stimulate growth and create liveable, attractive and prosperous places over the next twenty years. The Strategy identifies the site as an '*Area with Opportunities to Improve*'. With this in mind, landscape design proposals take into consideration the objectives set out within the Strategy, which are listed below.

2.1.28 The objectives for the Green Infrastructure Strategy in terms of biodiversity include:

- *'Enhance natural habitats, conserve ecological diversity and manage valuable natural resources.*
- *Advocate understanding of the need to manage biodiversity as being essential to society's wellbeing.*
- *Protect and enhance the diversity of different animal and plant species and habitats.*

- *Focus on species and habitats shown to be particularly vulnerable or important locally and globally.*
- *Manage and monitor our wildlife habitats in the light of climate change, the damaging effects of pollution, inappropriate development and neglect.*
- *Develop robust management plans which help to use resources in the most effective way.*
- *Restore, link and buffer existing natural places.*
- *Connect habitats, to build a more resilient network.*
- *Consider the biodiversity potential of every part of that network.'*

Rotherham Local Plan – Supplementary Planning Document No.3 - Development in Green Belt, July 2023 (RMBC, 2023)

2.1.29 The Site is located within the South and West Yorkshire Green Belt. Guidance on changing land-use within the Green Belt is provided in Section 6 of the document.

2.1.30 Green Belt Guidance 6 - Change of use of land:

'Planning applications to change the way land is used will need to show that the openness of the Green Belt will not be affected and there is no conflict with there as on the land was made part of the Green Belt.

They shall also comply with local and national policy which establishes that in appropriate development should not be approved except in very special circumstances, and that 'very special circumstances' will not exist unless the potential harm to the Green Belt by reason of inappropriateness, and any other harm resulting from the proposal, is clearly outweighed by other considerations.'

Guidance

2.1.31 The following guidance has been used during the writing of the Appraisal.

Guidelines for Landscape and Visual Impact Assessment, 3rd Edition (GLVIA3) (Landscape Institute and IEMA, 2013)

2.1.32 The Landscape Institute (LI) is the governing body for the profession of landscape architects. It published the third edition of the Guidelines for Landscape and Visual Impact Assessment (GLVIA3) (Landscape Institute, 2013) which sets out the principles for assessing the landscape and visual effects of developments and their significance and provides guidance upon establishing methodologies for undertaking such assessments. This guidance document forms the basis of the Landscape and Visual Impact Assessment's (LVIA) methodology.

2.1.33 Accompanying GLVIA3, the LI have prepared a 'Statement of Clarification 1/13 10-06-13' (Landscape Institute, 2013) and guidance upon the 'Visual Representation of Development Proposals 06/19' (Landscape Institute, 2019).

2.1.34 The LI have provided guidance on 'valued landscapes' outside national landscape designations: 'Assessing Landscape Value Outside National Designations – Landscape Institute Technical Guidance Note 02/21' (Landscape Institute, 2021). Within this document, landscape value is defined as *'the relative value or importance attached to different landscapes by society on account of their landscape qualities.'*

The Horlock Rules - Substations and the Environment: Guidelines on Siting and Design (The National Grid Company PLC, 1989)

2.1.35 Section 3 contains guidelines of relevance to Landscape and Visual matters:

'In the development of system options including new substations, consideration must be given to environmental issues from the earliest stage to balance the technical benefits and capital cost requirements for new developments against the consequential environmental effects in order to keep adverse effects to a reasonably practicable minimum.'

'The siting of substations, extensions and associated proposals should take advantage of the screening provided by land form and existing features and the potential use of site layout and levels to keep intrusion into surrounding areas to a reasonably practicable minimum.'

2.1.36 Appendix A of the guidance stipulates the requirement for the production of an Environmental Report and goes on to define the recommended content of the report. The aspects that relate to Landscape and Visual matters are set out below:

- Flora and fauna;
- Landscape and topography;
- Watercourses and land drainage generally;
- Local recreational uses; and
- Visual effects.

The Holford Rules - Guidelines for the routeing of new high voltage overhead transmission lines (The National Grid Company PLC, 1959)

2.1.37 Rules 4 and 5 contain the following wording of direct relevance to Landscape and Visual matters:

'Where possible avoiding cutting extensive swathes through woodland blocks and consider opportunities for skirting edges of copses and woods.'

'Protecting existing vegetation, including woodland and hedgerows, and safeguard visual and ecological links with the surrounding landscape.'

2.2 Study Area

2.2.1 The study area for Landscape and Visual matters comprises a 2km buffer from the land required to construct the Scheme. This has been established through analysis of the ZTV plan and the subsequent fieldwork undertaken.

2.3 Surveys

2.3.1 A desk-based review of all potential Landscape and Visual receptors has been undertaken in April 2026. A field survey of publicly accessible areas (Public Rights of Way (PRoWs), public highways and public open space, etc.) within the study area was undertaken in December 2023.

2.3.2 The location of Representative Viewpoints (RVs), from publicly accessible land, that are representative of these receptors are shown on Appendix D, Long Lane Overhead Line Drawings; Figure 3.3.5 of the EAR.

2.4 Appraisal Approach

Overview

- 2.4.1 This section outlines the methodology for assessing the likely effects upon landscape character and visual amenity receptors during the construction and operation phases of the Scheme.
- 2.4.2 The methodology for the LVIA has been prepared in accordance with GLVIA3. The guidance contained within GLVIA3 is not prescriptive but instead seeks to establish certain principles that would help achieve a degree of consistency with regard to the production of such assessments. The key steps of the methodology are set out below.
- 2.4.3 In line with paragraph 1.15 of GLVIA3 this LVIA distinguishes between ‘impact’ (defined as the action being taken), and ‘effect’ (defined as the change resulting from that impact upon the sensitivity of a receptor). The process is referred to as ‘impact assessment’ but any changes identified as likely to arise from the Scheme are referred to as ‘effects’.
- 2.4.4 The appraisal includes a combination of objective and subjective judgements. To avoid making assumptions regarding people’s expected responses, subjective judgements are avoided where possible, focussing instead upon what objectively would be experienced. Given the nature of landscape character and people’s differing connections with it, plus the differences between people’s expectations with regard to visual amenity, reasoned professional experience is required where subjective judgements are necessary.

Establishing Baseline Conditions

- 2.4.5 The establishment of the appraisal’s baseline conditions has entailed:
- The gathering and understanding of published information on the landscape character, nature and value of the land required to construct the Scheme and its surrounds;
 - Determination of a study area within which the Scheme may be visible from;
 - Identification of different groups of people who may experience views of the Scheme (the visual receptors) and the nature of their existing views, visual experience and their visual amenity;
 - Identification of landscape receptors (areas of identifiable character), and their characteristics from a combination of analysis of published sources, research and field work;
 - Visits to the Site and across the study area to publicly accessible areas nearest to the identified receptors; and
 - Input into the planning of the Scheme as part of an iterative design process to ensure likely adverse effects are identified and where possible avoided, reduced, abated and/or compensated for, with mitigation measures that are embedded into the Scheme.

Landscape Character Baseline Study Methodology

- 2.4.6 The baseline study identified the existing character of the landscape, its constituent elements, features and its geographical and historical context. It assessed the condition of the landscape, the way it is experienced, the value attached to it and its susceptibility to change. The assessment of susceptibility to change examined whether the landscape receptor could accommodate the Scheme without significant changes to local character.
- 2.4.7 The identification of character areas was informed by published character assessments: The National Character Area (NCA) profiles published by Natural England provided the wider landscape context of the Site and published local landscape character assessments (LLCA) provided a more regional and local context. The findings of the desk study were reviewed in conjunction with the site survey to identify local and concentrated landscape character areas, which can be defined as broadly homogenous units of distinct features and elements.
- 2.4.8 The appraisal considers:
- the physical influences on the landscape resource – geology, soils, landform, drainage and water bodies;
 - the influence of human activity – land use, land management, the character of settlement and buildings, the pattern and type of fields and enclosure; and
 - the aesthetic and perceptual aspects of the landscape – scale, complexity, openness, tranquillity and wildness.

Landscape Resource/Receptors

- 2.4.9 The landscape resource describes the physical and perceptible nature of areas and places and the inherent features which give them their distinctive character. Visual amenity is a linked but separate resource which considers the views experienced by people within the landscape resource.
- 2.4.10 The appraisal considers the effects upon identified areas of distinct landscape character within the study area, and in particular upon their key landscape components, characteristics, and perceptual and aesthetic qualities.

Landscape receptor susceptibility

- 2.4.11 ‘Susceptibility’ is defined in GLVIA3 (paragraph 5.40) as *‘the ability of the landscape receptor (whether it be the overall character or quality/condition of a particular type or area, or an individual element and/or feature, or a particular aesthetic and perceptual aspect) to accommodate the proposed development without undue consequences [...] of the baseline situation...’*.
- 2.4.12 Reasoned professional judgements on the ‘susceptibility’ of landscape receptors are recorded as ‘high’, ‘moderate’ or ‘low’. The descriptions of these are shown in Table 2.1.

Table 2.1 Susceptibility of landscape receptors

Susceptibility	Description
High	The landscape receptor is less able to accommodate the type of change that the Scheme may bring about without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape offer limited opportunities for accommodating the change without its key characteristics being fundamentally altered, leading to a different landscape character.
Moderate	The landscape receptor is partly able to accommodate the type of change that the Scheme may bring about without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape offer some opportunities for accommodating the change without its key characteristics being fundamentally altered.
Low	The landscape receptor is more able to accommodate the type of change that the Scheme may bring about without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape are resilient to being changed by the Scheme.

2.4.13 The ‘susceptibility’ that is determined is not absolute and relates to the type of change that is proposed. As a particular landscape receptor may exhibit differing levels of ‘susceptibility’ a narrative commentary is provided to describe and justify the indicative grading levels ascribed to that or the intermediate grading between them. Where intermediate ratings are given e.g. ‘Low/Moderate’, this indicates a grading that is both less than ‘Moderate’ and more than ‘Low’, rather than one which varies across the range.

2.4.14 The use of intermediate ratings in this way applies to all other similar categorisations across the rest of the methodology.

Landscape receptor value

2.4.15 In contrast to ‘susceptibility’, the categorisation of landscape ‘value’ of a landscape receptor relates purely to its existing baseline, and as such is independent of any development proposal.

2.4.16 ‘Value’ is defined in the GLVIA3 (paragraph 5.19) as ‘...the relative value that is attached to different landscapes by society, bearing in mind that a landscape may be valued by different stakeholders for a whole variety of reasons...’.

2.4.17 GLVIA3 goes on to state that ‘a review of existing landscape designations is usually the starting point in understanding landscape value, but the value attached to undesignated landscapes also needs to be carefully considered and individual elements of the landscape – such as trees, buildings or hedgerows – may also have value. All need to be considered where relevant’.

2.4.18 Paragraph 5.20 of GLVIA3 indicates the information set out below might contribute to understanding landscape value:

- information about areas recognised by statute such as National Parks, Areas of Outstanding Natural Beauty;
- local planning documents for local landscape designations;

- information on features such as Conservation Areas, listed buildings, Tree Preservation Orders, important hedgerows, historic or cultural sites;
- art and literature, identifying value attached to particular areas or views;
- material on landscapes of local or community interest, such as local green spaces, village greens or allotments; and
- any evidence that indicates whether the landscape has particular value to people that would suggest that it is of greater than community value.

2.4.19 This matter is further expanded upon in the Landscape Institute 2021 document: ‘Assessing Landscape Value Outside National Designations – Landscape Institute Technical Guidance Note 02/21’ (Landscape Institute, 2021).

2.4.20 Taking these into account, the relative value of each landscape receptor has been determined using the eight criteria identified within paragraph Box 5.1 of GLVIA3. The value of each criterion has been graded as ‘High’, ‘Moderate’ or ‘Low’. The criteria and value grades are described in Table 2.2 below.

Table 2.2 Landscape receptor value

Criterion (<i>Italic text taken from GLVIA3, Box 5.1</i>)	Grade	Description
Landscape Quality/Condition <i>‘A measure of the physical state of the landscape. It may include the extent to which typical character is represented in individual areas, the intactness of the landscape and the condition of individual elements.’</i>	High	Landscape in good condition with intact elements that are well-managed.
	Moderate	Landscape is in fair condition with some intact elements and limited signs of management
	Low	Landscape is in poor condition with few intact elements and limited signs of management.
Scenic Quality <i>‘The term used to describe landscapes that appeal primarily to the senses (primarily but not wholly the visual senses).’</i>	High	Landscape is of high scenic quality, usually recognised in some form of landscape designation (local or national).
	Moderate	Landscape is of moderate scenic quality.
	Low	Landscape is of low scenic quality.
Rarity <i>‘The presence of rare elements or features in the landscape or the presence of rare characteristics.’</i>	High	Landscape has several rare elements or characteristics.
	Moderate	Landscape has few rare elements or characteristics.
	Low	Landscape has no rare elements or characteristics.

Criterion (Italic text taken from GLVIA3, Box 5.1)	Grade	Description
Representativeness <i>‘Whether the landscape contains a particular character and/or features or elements which are considered particularly important examples.’</i>	High	The area displays most of the characteristics of the corresponding identified area of distinct landscape character.
	Moderate	The area displays some of the characteristics of the corresponding identified area of distinct landscape character.
	Low	The area displays few or none of the characteristics of the corresponding identified area of distinct landscape character.
Conservation Interest <i>‘The presence of features of wildlife, earth science or archaeological or historical interest can add to the value of the landscape as well as having value in their own right.’</i>	High	Landscape has several different conservation interests, often of national or international importance.
	Moderate	Landscape has some conservation interests, often regional or local importance.
	Low	Landscape has few or no conservation interests.
Recreation Value <i>‘Evidence that the landscape is valued for recreational activity where experience of the landscape is important.’</i>	High	Landscape is highly valued for recreation, likely to have many PRoWs and potentially including some national trails or national cycle routes and/or a well-used destination public open space.
	Moderate	Landscape is locally valued for recreation, likely to have PRoWs and cycle routes, and local/neighbourhood public open spaces.
	Low	Landscape is not greatly valued for recreation and is likely to be lacking in PRoWs or public open space.
Perceptual Aspects <i>‘A landscape may be valued for its perceptual qualities, notably wilderness and/or tranquillity.’</i>	High	Landscape has an overwhelming sense of aesthetic quality, low levels of human influence, and/or high sense of tranquillity/remoteness.
	Moderate	Landscape has a moderate sense of aesthetic quality, moderate levels of human influence, and/or moderately tranquil/remote.
	Low	Landscape has a low degree of aesthetic quality; human influence is readily apparent

Criterion (<i>Italic text taken from GLVIA3, Box 5.1</i>)	Grade	Description
		and/or is not considered particularly tranquil or remote.
Cultural Associations <i>‘Some landscapes are associated with particular people, such as artists or writers, or events in history that contribute to perceptions of the natural beauty of the area.’</i>	High	Landscape has strong associations with people, literature or historic events that link directly with the characteristics and landscape elements/features of the area.
	Moderate	Landscape has associations with people, literature or historic events that link with the characteristics and elements of the area but do not necessarily rely solely on them.
	Low	Landscape has no associations that link with the characteristics and landscape elements/features of the area.

2.4.21 Based upon the considerations of each criterion set out in Table 2.2 a reasoned professional judgement is made as to what the relative overall ‘value’ of each landscape receptor is using the grading of ‘High’, ‘Moderate’ or ‘Low’ or where necessary, intermediate grades between these. As a particular landscape receptor may exhibit differing levels of ‘value’, a narrative commentary is provided to describe and justify the indicative grading level ascribed to that.

Landscape receptor sensitivity

2.4.22 GLVIA3 (paragraph 3.26) states that the sensitivity of the landscape receptors identified should be determined by consideration of the ‘susceptibility’ of the receptor with the receptor’s relative ‘value’, i.e.: Landscape Sensitivity = Landscape Susceptibility + Landscape Value.

2.4.23 The values for ‘susceptibility’ and ‘value’ are considered, by use of reasoned professional judgement to derive an overall ‘sensitivity’ for each receptor – graded as per the criteria set out in Table 2.3 below.

2.4.24 The ‘sensitivity’ that is determined is not absolute and relates to the type of change that is proposed. As a particular landscape receptor may exhibit differing levels of ‘sensitivity’, a narrative commentary is provided to describe and justify the indicative grading levels ascribed to that or the intermediate grading between them.

Table 2.3 Sensitivity of landscape receptors

		Value of the Landscape Receptor (Indicative)		
		High	Moderate	Low
Susceptibility to Change	High	High	Moderate/High	Moderate
	Moderate	Moderate/High	Moderate	Moderate/Low
	Low	Moderate	Moderate/Low	Low

Visual Receptors

- 2.4.25 This part of the appraisal is concerned with potential effects upon the visual amenity of specific groups of people (the visual receptors) within the study area as a result of the Scheme. This includes groups such as residents, those in their place of work, those travelling through the study area, and recreational users of publicly accessible areas etc.
- 2.4.26 The appraisal of effects on settlements focuses on the visual amenity of users of public spaces and streets, though views from dwellings will also be noted in the descriptions.

Visual receptor susceptibility

- 2.4.27 As described in GLVIA3, the ‘susceptibility’ of visual receptors to changes in visual amenity is a function of the *‘occupation or activity of people experiencing the view’* and *‘the extent to which their attention is focused on the views and visual amenity they experience at particular locations.’* Drawn from the guidance within GLVIA3 this is recorded as ‘high’, ‘moderate’ or ‘low’ according to Table 2.4 or, where necessary, intermediate grades between these. As a particular visual receptor may exhibit differing levels of ‘susceptibility’ a narrative commentary is provided to describe the reasoned professional judgement used to justify the indicative grading level ascribed.

Table 2.4 Susceptibility of visual receptors

Susceptibility	Description
High	The landscape receptor is less able to accommodate the type of change that the Scheme may bring about without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape offer limited opportunities for accommodating the change without its key characteristics being fundamentally altered, leading to a different landscape character.
Moderate	The landscape receptor is partly able to accommodate the type of change that the Scheme may bring about without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape offer some opportunities for accommodating the change without its key characteristics being fundamentally altered.
Low	The landscape receptor is more able to accommodate the type of change that the Scheme may bring about without undue negative consequences to the baseline situation. Attributes that make up the character of the landscape are resilient to being changed by the Scheme.

Visual receptor value

- 2.4.28 GLVIA3 (paragraph 6.3.7) suggests that when considering the visual receptor ‘value’, account should be taken of recognition of:
- *‘value attached to particular views, for example in relation to heritage assets, or through planning designations’; and*

- *'indicators of the value attached to views by visitors, for example through appearances in guidebooks or on tourist maps, provision of facilities for their enjoyment (such as parking places, sign boards and interpretative material) and references to them in literature or art...'*

2.4.29 Drawn from the guidance within GLVIA3 this is recorded as 'high', 'medium' or 'low' according to Table 2.5 below. The 'value' that is determined is not absolute and relates to the type of change that is proposed. As a particular visual receptor may exhibit differing levels of 'value', a narrative commentary is provided, to describe the professional judgement used to justify the indicative grading levels ascribed to that or the immediate grading between them.

Table 2.5 Value of visual receptors

Value (Indicative)	Description
High	Views experienced by receptors are widely known, well frequented and/or promoted as a beauty spot/visitor destination. The cultural associations of the visual experience are recognised in art, literature or other media. The view relates to the experience of other features, for example heritage assets.
Moderate	Views experienced by receptors, whilst they may be valued locally, are not widely known. The views experienced have no strong cultural association.
Low	Views experienced by receptors have little/no recognised value. The public are unlikely to visit to experience the views available.

Visual receptor sensitivity

Nature of visual receptors (sensitivity)

2.4.30 GLVIA3 states that the nature of visual amenity receptors, commonly referred to as their sensitivity, should be assessed in terms of the combination of the susceptibility of the receptor (to the type of change proposed) with the value attached to the receptor. i.e.: Visual Amenity Sensitivity = Visual Amenity Susceptibility + Visual Amenity Value.

Overall visual receptors sensitivity

2.4.31 The values for 'susceptibility' and 'value' are then considered together, by use of reasoned professional judgement, to derive an overall 'sensitivity' for each receptor – graded as per the criteria set out in Table 2.6 below.

2.4.32 The 'sensitivity' that is determined is not absolute and relates to the type of change that is proposed. As a particular visual receptor may exhibit differing levels of 'sensitivity' a narrative commentary is provided, to describe and justify the indicative grading levels ascribed to that or the intermediate grading between them.

Table 2.6 Sensitivity of receptors

		Value of the Visual Receptor (Indicative)		
		High	Moderate	Low
Susceptibility to Change	High	High	Medium/High	Medium
	Moderate	Medium/High	Medium	Medium/Low
	Low	Medium	Medium/Low	Low

Determining Magnitude of Change

2.4.33 The magnitude of Landscape and Visual change depends upon a combination of factors including the size, scale and nature of change in relation to the context; the geographical extent of the area influenced; and its duration and reversibility, as summarised in Table 2.7 below.

Table 2.7 Magnitude of landscape and visual change

Value	Size, Scale and Nature	Geographic Extent	Duration and Reversibility
High	Occupies much of the view or obstructs a significant portion. Forms a large or very noticeable or discordant element. Considerable change to key features or many existing elements of the landscape. Introduces elements considered totally uncharacteristic to the existing landscape. Very noticeable.	Ranging from notable change over extensive area to intensive change over a more limited area.	Long term; permanent/non-reversible or partially reversible.
Medium	Occupies a noticeable portion of the view or obstructs a noticeable portion. Forms a noticeable discordant element. Some considerable change to existing landscape elements and/or landscape character; discernibly changes the surroundings of a receptor, such that its baseline is partly altered. Readily noticeable.	Moderate changes in a localised area.	Medium term; semi-permanent or partially reversible.

Value	Size, Scale and Nature	Geographic Extent	Duration and Reversibility
Low	Occupies a small portion of the view; small change to existing landscape elements and/or landscape character; slight, but detectable impacts that do not alter the baseline of the receptor materially. Not readily noticeable.	Minor changes in a localised area.	Short term/temporary; partially reversible or reversible.

Level of effect criteria

- 2.4.34 The level of Landscape and Visual effect is assessed based on the sensitivity of the affected receptor, and the magnitude of change resulting from the Scheme, as set out for each above. The combined sensitivity and magnitude used to determine the level of effect is summarised in Table 2.8 below. Note that effects can be either 'beneficial' or 'adverse' and in some cases 'neutral' (neither beneficial nor adverse).

Table 2.8 Level of landscape and visual effect

Magnitude	Sensitivity		
	High	Medium	Low
High	Major	Major to Moderate	Moderate to Minor
Medium	Major to Moderate	Moderate	Minor
Low	Moderate to Minor	Minor	Minor to Negligible
Negligible	Minor	Negligible	Negligible
No Change	Neutral	Neutral	Neutral

- 2.4.35 It should be noted that this matrix is intended as a framework only and that the level of effect will vary depending on the circumstances, the type and scale of development proposed, the baseline context and other factors.
- 2.4.36 The gradations of magnitude of change and level of effect used in the Appraisal represent a continuum; the appraiser uses professional judgement when gauging the level of effect.

2.5 Limitations and Assumptions

- 2.5.1 The following limitations and assumptions have been identified for Landscape and Visual.

Limitations

Extents of the study area

- 2.5.2 Based upon the findings of ZTV analysis, it is considered that the Scheme would not result in any notable effects upon receptors outside the visual envelope of the Scheme and beyond 2km from the location of the Site. Accordingly, landscape and visual receptors beyond this have been scoped out of the appraisal.

Assumptions

Professional judgement

- 2.5.3 To avoid making assumptions regarding other people's expected responses to changes in landscape character and visual amenity matters, subjective judgements are avoided where possible in this appraisal. The focus instead is predominantly upon what objectively will be experienced as a result of the Scheme. Given the nature of landscape character and people's differing connections with it, plus the differences between people's expectations with regard to visual amenity, reasoned professional experience is required where subjective judgements are necessary.

Distances

- 2.5.4 Approximate distances are given in the appraisal (rounded to the nearest 10m) between the nearest part of the Site and the nearest part of the receptor in question, unless explicitly stated otherwise.

3. Cultural Heritage and Archaeology Methodology

3.1 Legislation, Policy and Guidance

- 3.1.1 This assessment has been undertaken in accordance with current national legislation, and national and local plans and policies relating to Cultural Heritage and Archaeology in the context of the land required to construct the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Policy

National

- 3.1.2 The NPPF (17 August 2026) sets out Government planning policies for England and how these are expected to be applied. Section 20 of the NPPF 'Conserving and enhancing the historic environment' contains the government's policies relating to the historic environment. It states that:

'Heritage assets are an irreplaceable resource, and range from sites and buildings of local historic value to those of the highest significance, such as World Heritage Sites which are internationally recognised to be of Outstanding Universal Value. These assets are an irreplaceable resource, and should be conserved in a manner appropriate to their significance, so that they can be enjoyed for their contribution to the quality of life of existing and future generations.'

- 3.1.3 HE5 states that:

'Development proposals affecting heritage assets should be accompanied by an assessment of the significance of the assets affected (including any contribution made by their setting) and of the potential effect of the proposal on their significance. The level of detail should be proportionate to the assets' importance and no more than is necessary to understand the potential effect of the proposal on their significance. The relevant historic environment record should be referred to in making this assessment, and appropriate expertise employed where necessary..'

- 3.1.4 HE4 states that:

'...development proposals which would affect the significance of heritage assets, including any contribution made by their setting should:

a. Maintain or secure a use consistent with their conservation, taking into account the importance of maintaining the assets, the positive contribution they can make to sustainable communities including local economies, and the positive contribution they can make to local character and distinctiveness; and

b. Avoid (or if that is not possible, minimise) harm to the significance of heritage assets, and instead conserve this significance.'

3.1.5 HE6 states that:

‘When considering the potential effect of a development proposal on the significance of a designated heritage asset, substantial weight should be given to the asset’s conservation (and the more important the asset, the greater the weight should be). This is irrespective of whether any potential effect amounts to a positive effect, harm, substantial harm, or total loss of its significance.’

3.1.6 HE4 further states that:

‘Any harm to, or loss of, the significance of a designated heritage asset (including from development within its setting) should have a clear and convincing justification in accordance with the policies in [Section 20 of the NPPF].’

3.1.7 HE7 states that:

‘1. Development proposals which would have a positive effect on a non-designated heritage asset should be supported.

2. Where a development proposal would harm the significance of a non-designated heritage asset, this should be weighed against the benefits of the proposal and a balanced judgement made, having regard to the scale of any harm or loss and the significance of the non-designated heritage asset.

3. Where a development proposal would cause substantial harm to, or the total loss of, the significance of a non-designated heritage asset, it should only be supported where the harm or loss is outweighed by the benefits of the proposal, having regard to the scale of the harm or loss and the significance of the non-designated heritage asset.’

3.1.8 HE10 states that:

‘The applicant should record and advance understanding of the significance of the asset to be lost in a manner proportionate to its importance and the potential impact upon it; and should make this evidence (and any archive generated) publicly accessible by depositing it in the relevant Historic Environment Record, and any archives with a local museum or other public depository. The ability to record evidence of our past should not be a decisive factor in deciding whether such loss should be approved.’

Local

3.1.9 Rotherham Local Plan Core Strategy 2013-2028 (RMBC, 2023), Policy CS 23 ‘Valuing the Historic Environment’ states that:

- *‘Policy CS23 seeks to ensure that heritage assets are safeguarded or enhanced for the future both for their own heritage merits and for the wider benefits they bring (5.6.83);’*
- *‘The Medieval record of the borough is particularly strong, with a number of extant villages retaining their Medieval character in addition to the archaeological record of deserted villages, moated sites fortifications and relict landscapes (5.6.85);’*
- *‘Listed Buildings and Scheduled Monuments are afforded protection through national planning legislation and policy. The heritage significance of registered parks and gardens of special historic interest is a material consideration in the determination of planning applications’ (5.6.86);’*

- *‘The key characteristics of the borough's conservation areas are described in conservation area character summaries. It is intended to make these available on the Councils website. Work is currently being undertaken on more detailed Conservation Area appraisals and management plans which will then be used to identify and assess local character and promote enhancement’ (5.6.87); and*
- *Rotherham contains a wealth of archaeological material and evidence for the development of its historic landscapes and townscapes, all of which contribute to the borough's identity. In addition, such evidence has the potential to inform our understanding of the development of the borough, as further research is carried out. Known archaeological sites, including Scheduled Monuments, are recorded in the South Yorkshire Sites and Monuments Record maintained by the South Yorkshire Archaeological Service. The South Yorkshire Archaeological Service also holds the results of the South Yorkshire Historic Environment Characterisation project. The policy will ensure that this evidence is given due consideration in planning decisions’ (5.6.89).*

Guidance

3.1.10 Guidance produced by the Chartered Institute for Archaeologists (CIfA) and Historic England has been taken into account as far as practicable and where relevant to this assessment as follows:

- Chartered Institute for Archaeologists:
 - Code of Conduct (2022);
 - Regulations for Professional Conduct (2021);
 - Standards and Guidance for Historic Environment DBA (2020a); and
 - Standard and Guidance for Commissioning Work or Providing Consultancy Advice on Archaeology and the Historic Environment (2020b).
- Historic England
 - Conservation Principles, Policies and Guidance for the Sustainable Management of the Historic Environment (2008);
 - Historic Environment Good Practice Advice in Planning Note 2 (GPA 2) – Managing Significance in Decision-Taking (2015);
 - Historic Environment Good Practice Advice in Planning Note 3 (2nd edition) (GPA 3) – The Setting of Heritage Assets (2017);
 - Statements of Significance: Analysing Significance in Heritage Assets, Historic England Advice Note 12 (2019); and
 - Local Heritage Listing – Identifying and Conserving Local Heritage Advice Note 7 (Second Edition) (2021).
- Planning Practice Guidance (PPG)
 - Historic Environment (2019).

3.2 Study Area

- 3.2.1 The study area for Cultural Heritage and Archaeology comprises the land required to construct the Scheme and a 500m buffer. This is considered an appropriate study area based on professional judgement by relevant guidance, best practice and technical knowledge of similar schemes, and the nature of the Scheme construction and operational activities. The study area has also been defined proportionately to the scale and nature of the Scheme, with a 500m radius applied to capture assets potentially affected by changes to setting.

3.3 Surveys

- 3.3.1 A desk-based assessment was undertaken for the land required to construct the Scheme in 2023. This included a walkover survey. The assessment utilised walkover surveys and this assessment renewed HER data that included land required to construct the Scheme, as reported in the main EAR. No further walkover survey has been undertaken.

3.4 Appraisal Approach

- 3.4.1 In order to identify the environmental impacts of the Scheme, a comparison of the current environmental conditions immediately before the Scheme is implemented (baseline) was compared to a prediction of how the environmental conditions are likely to change once the construction and operation of the Scheme has been undertaken. An iterative process was followed during appraisal to develop appropriate control measures to avoid or reduce potential environmental impacts.
- 3.4.2 Historic England's guidance and assessment methodologies have been utilised to assess and articulate the significance of heritage assets (including the contribution made by their setting) as defined by the NPPF ((MHCLG, 2026), and the potential effects of the Scheme on that significance. The significance of heritage assets is weighed by consideration of the potential for the asset to demonstrate the following value criteria:
- Evidential value – derives from the potential of a place to yield evidence about past human activity;
 - Historical value – derives from the ways in which past people, events and aspects of life can be connected through a place to the present. It tends to be illustrative or associative;
 - Aesthetic value – derives from the ways in which people draw sensory and intellectual stimulation from a place; and
 - Communal value – derives from the meanings of a place for the people who relate to it, or for whom it figures in their collective experience or memory. Communal values are closely bound up with historical (particularly associative) and aesthetic values but tend to have additional and specific aspects.

3.4.3 There is also recent guidance from the Chartered Institute for Archaeologists (CIfA), set out in the “Principles of Cultural Heritage Impact Assessment in the UK” (2021), which states that:

The magnitude of the impact on cultural significance needs to be assessed. A distinction needs to be drawn as to whether the change will result in only a ‘small’ impact on, say just one component of cultural significance or whether the change would have a greater impact on the totality of cultural significance. The terms ‘large’ ‘medium’ or ‘small’ are acceptable or any other simple scale that offers a form of gradation easily articulated in a written report (CIFA).

3.4.4 The appraisal approach has assessed the scale, extent, duration and frequency of change arising from construction and operation of the Scheme. The magnitude of impact has been assessed from negligible to high depending on the degree to which the significance of the heritage asset is affected.

3.4.5 The appraisal approach has been utilised to assess the potential for construction activities and the operation of the Scheme to impact the significance of heritage assets. This impact can typically involve direct and indirect effects to the heritage assets.

3.4.6 Following an assessment of the magnitude of impact, mitigation measures may be proposed. The significance of effect is expressed as a result of the value of the heritage asset and the magnitude of impact it would experience as a result of the Project. The significance will be expressed as major, moderate, minor, negligible or neutral and can be adverse or beneficial. The matrix for reporting of significance of effect is outlined below, adapted from ‘Heritage Impact Assessments for Cultural World Heritage Properties’ (ICOMOS, 2011).

Table 3.1 Significance of effects matrix

		Value of the Heritage Asset				
		Very High	High	Medium	Low	Negligible
Magnitude of Impact	High	Major	Major	Major to moderate	Major to moderate	Moderate to Minor
	Medium	Major to Moderate	Major to Moderate	Moderate	Moderate	Minor
	Low	Major to Moderate	Moderate to Minor	Minor	Minor	Negligible
	Negligible	Minor	Minor	Negligible	Negligible	Negligible
	No Change	Neutral	Neutral	Neutral	Neutral	Neutral

3.4.7 This has considered the proximity of receptors to construction activities and the likelihood of receptors being physically disturbed or indirectly impacted through changes to their setting. Appropriate control measures have been identified to avoid or reduce these impacts.

3.5 Limitations and Assumptions

- 3.5.1 The report is based on information available at the time. Data from Historic Environment Records (HER) and other datasets consists of secondary information derived from varied sources, only some of which were directly examined during the compilation of this report. Furthermore, due to the nature of archaeological remains, their precise location is often uncertain as the majority of such sites have never been subject to archaeological investigation to modern standards. As such, assessment of the value of such sites is often reliant on informed extrapolation from limited data, comparison with similar receptors in similar contexts, and on professional judgement.

4. Air Quality Methodology

4.1 Legislation, Policy and Guidance

- 4.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Air Quality Assessment in the context of the land required to construct the Scheme (the Site). A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Legislation

- 4.1.2 A summary of the key legislation considered is outlined in Table 4.1 below.

Table 4.1 Key legislation applicable to the Scheme

Legislation	Legislative Context
Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe	This sets legally binding limits for concentrations of specific air pollutants. It merges, consolidates and replaces the majority of previous EU air quality legislation, and incorporates the Fourth Daughter Directive. While the UK has now left the EU, the Air Quality Standards Regulations 2010 (as amended) which implement the Directive still apply in UK legislation as 'retained EU law'.
The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019	These regulations amend the Air Quality Standards Regulations 2010 to reflect the UK's departure from the EU.
The Air Quality (England) Regulations 2000	The Air Quality (England) Regulations 2000 set national air quality objective levels for local authorities to meet in England.
The Air Quality (England) (Amendment) Regulations 2002	The Air Quality (England) Regulations 2002 set national air quality objective levels for local authorities to meet in England.
Part IV of Environment Act 1995	Environment Act 1995 contains provisions for protecting air quality in the UK and for local air quality management. It requires the UK Government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality, and defines Local Air Quality Management (LAQM). It introduced an obligation on local authorities to issue, where the air quality standards are not being met, an order designating an Air Quality Management Area (AQMA).
Environmental Protection Act (EPA) 1990	Part III of the EPA 1990 provides legislation around statutory nuisance, which applies to dust.

Legislation	Legislative Context
The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020	Regulation 2 of the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 updated the Air Quality Standards Regulations 2010 to include a Limit Value of 20µg/m ³ for PM _{2.5} from 2020. The Limit Values for NO ₂ and PM ₁₀ remained the same concentration levels as the relevant AQS objectives.
Environment Act 2021	Creates the legislative framework by which statutory air quality targets are set by reference to plans such as the Environmental Improvement Plan 2023.
The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023	The legislation sets out targets to reduce concentrations of PM _{2.5} to be equal to or less than 10µg/m ³ by 2040. It also states that reduction in population exposure to PM _{2.5} must be reduced by at least 35% by 2040, compared to a baseline year of 2018.

- 4.1.3 The ambient air quality standards and objectives are given statutory backing in England through the Air Quality (England) Regulations 2000 and the Air Quality (England) (Amendment) Regulations 2002. The Limit Values were given statutory backing through The Air Quality Standards Regulations 2010. The AQS objectives for the protection of human health and applicable to this assessment are presented in Table 4.2.
- 4.1.4 There are no existing AQS objectives for PM_{2.5}, however there is a legally binding Limit Value under The Air Quality Standards Regulations 2010, an Interim PM_{2.5} target under the Environmental Improvement Plan (EIP) 2025 and a Statutory long-term target under the Environment Act 2021 and Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.

Table 4.2 Air quality objectives and limit values for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Air Quality Objectives			Limit Values		
	Concentration	Averaging Period	Compliance Date	Concentration	Averaging Period	Compliance Date
NO ₂	200µg/m ³	1-hour mean (not to be exceeded more than 18 times per year)	31 December 2005	200µg/m ³ (18 exceedances)	1-hour mean (not to be exceeded more than 18 times per year)	1 January 2010
	40µg/m ³	Annual mean	31 December 2005	40µg/m ³	Annual mean	1 January 2010
PM ₁₀	50µg/m ³	24-hour mean (not to be exceeded more than 35 times per year)	31 December 2010	50µg/m ³ (35 exceedances)	24-hour mean (not to be exceeded more than 35 times per year)	1 January 2005

Pollutant	Air Quality Objectives			Limit Values		
	Concentration	Averaging Period	Compliance Date	Concentration	Averaging Period	Compliance Date
		exceeded more than 35 times per year)			exceeded more than 35 times per year)	
	40µg/m ³	annual mean	31 December 2004	40µg/m ³	Annual mean	1 January 2005
PM _{2.5}	No existing AQS objective for PM _{2.5}			20µg/m ³ (Limit Value)	Annual mean	1 January 2020
				10µg/m ³ (Interim PM _{2.5} Target)	Annual Mean	December 2030
				10µg/m ³ (Statutory long-term target)	Annual Mean	2040

Policy

4.1.5 A summary of relevant national planning policy considered is outlined in Table 4.3 below.

Table 4.3 The relevant national planning policies applicable to the Scheme

Policy Document	Policy Context
NPPF (MHCLG, 2026) P3	The NPPF states that development proposals should sustain and contribute towards compliance with relevant limit values or national objectives and targets for air pollutants including PM _{2.5} and take account of AQMAs and Clean Air Zones as well as cumulative impacts. Mitigation should be identified.
Planning Practice Guidance - Air Quality (MHCLG, 2019)	Provides guidance on the relevant principles of air quality assessment; including the regulatory framework, the role of plan making, available air quality information, when assessment is required, what potential air quality issues require consideration, the level of detail required, and mitigation.
Environmental Improvement Plan 2023 (DEFRA, 2023), Goal 2 - Clean Air	Details government actions to reduce air pollution over next 25 years to achieve 'clean air' as a means of complying with concentration and emissions reduction targets, such as those facilitated by the Environment Act 2021. The delivery plan focusses on reducing domestic emissions, empowering local authorities to deliver clean air, maintaining and improving the regulatory framework for industrial emissions, reducing agricultural ammonia emissions and reducing emissions from transport.

4.1.6 A summary of relevant local planning policy considered is outlined in Table 4.4 below.

Table 4.4 The relevant local policy applicable to the Scheme

Policy Document	Policy Context
Rotherham Local Plan, Core Strategy 2013 - 2028 (adopted May 2024) (Rotherham Metropolitan Borough Council, 2014)	<p>The plan sets out the Council’s strategies and policies to plan and manage growth and development.</p> <p>Relevant policies within the Local Plan include:</p> <ul style="list-style-type: none">• Policy CS 14.k - Not allowing new development in Air Quality Management Areas unless traffic and air quality impacts are appropriately mitigated.• Policy CS 27.d - Potential adverse effects of additional development near to hazardous installations and upon Air Quality Management Areas.

Guidance

4.1.7 The following relevant guidance, specific to the appraisal of Air Quality, has informed this EAR.

Ministry of Housing, Communities and Local Government Planning Practice Guidance (PPG)

4.1.8 The Government has revised and updated planning practice guidance to support the NPPF in order to make it more accessible. The guidance includes advice relating to: planning and air quality; the role of Local Plans with regard to air quality; when air quality is likely to be relevant to a planning decision; what should be included within an air quality assessment; and how impacts on air quality can be mitigated.

Institute of Air Quality Management (IAQM) (2024) Guidance on the assessment of dust from demolition and construction

4.1.9 This provides a mechanism for the assessments to consider both the magnitude of emissions and sensitivity of an area to define the level of risk of dust soiling and human health impacts during the construction phase. Defining the construction dust risk levels allows proportionate mitigation measures to be adopted. This guidance is referred to hereafter as the ‘IAQM construction dust guidance’.

IAQM (2017) Land-Use Planning & Development Control: Planning For Air Quality

4.1.10 This is applicable in assessing the effect of changes in exposure of members of the public resulting from developments. It provides guidance on how to decide whether an air quality assessment is required, how to undertake a suitable assessment of air quality impacts and whether these are to be considered significant or not, and how to identify whether additional mitigation is required. This guidance would be used to inform the assessment methodology for construction and operational phase vehicle emissions. This guidance is referred to hereafter as the ‘IAQM Development Control guidance’.

IAQM (2020) A guide to the assessment of air quality impacts on designated nature conservation sites

- 4.1.11 This document has been produced by the IAQM to assist its members in the assessment of the air quality impacts of development on designated nature conservation sites. It may also be useful for ecologists, who use the results of air quality assessments (AQAs) to evaluate the effects of air pollution on habitats and species, by increasing their understanding of the information provided by air quality specialists. This document focuses on air quality assessments in support of HRA, but its principles can be used as the basis for assessing the air quality impact on national or local designated nature conservation sites.

Local Air Quality Management Technical Guidance (LAQM.TG22) (DEFRA, 2022)

- 4.1.12 This provides best practice principles for the technical assessment of local air quality including the use of monitoring data, selection of receptors and verification procedure. LAQM.TG22 also provides guidance for the application of DEFRA tools and resources used for the technical assessment of air quality.

4.2 Study Area

Construction Dust Risk Assessment

- 4.2.1 A construction risk dust assessment has been undertaken to establish the level of mitigation required in order to minimise and control dust emissions during construction. The IAQM construction dust guidance provides the relevant assessment methodology for undertaking the dust risk assessment.
- 4.2.2 In accordance with the IAQM construction dust guidance, the study area comprises:
- Up to 250m from the locations of demolition, construction and earthworks activities for human receptors and up to 50m for ecological receptors; and
 - Up to 50m from the route(s) used by construction vehicles on the public highway, up to 250m from the Schemes entrance(s).
- 4.2.3 The area within 250m of the land required to construct the Scheme and within 50m of the construction routes is largely comprised of rural uninhabited fields. There are residential developments 85m to the north east, 300m to the north, an 1.1km to the south west of the land required to construct the Scheme.
- 4.2.4 There is one ecological receptor located within the construction dust study area, Canklow Wood LWS, an ancient woodland site located 300m north of the land required to construct the Scheme.

Construction and Operational Phase Vehicle Emissions: Human Receptors

- 4.2.5 The Air Quality study area for vehicle emissions is defined as the area within 200m of any roads that exceed the traffic change criteria detailed in the IAQM Development Control guidance (IAQM, 2017). The screening criteria for vehicle emissions assessment is as follows:

- A change in Light Duty Vehicle (LDV) flows of >100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Area (AQMA), or >500 AADT elsewhere; and
- A change in Heavy Duty Vehicle (HDV) flows of >25 AADT within or adjacent to an AQMA, or >100 AADT elsewhere.

4.2.6 During the construction phase, the screening criteria are not exceeded at any point. Therefore, a construction phase air quality assessment of vehicle emissions is scoped out.

4.2.7 During the operational phase of the Scheme, it is understood that the only traffic generated would be associated with infrequent repair, routine maintenance and inspection activities (assumption of less than 10 vehicles per year). This number of vehicle movements is well below screening thresholds, therefore an operational phase air quality assessment of vehicle emissions is scoped out.

4.3 Surveys

4.3.1 No Air Quality monitoring surveys were undertaken to support the appraisal of the Scheme. This is because the site is rural in nature and the anticipated traffic increases in both the construction and operational phases were expected to screen out against the guidance Land-Use Planning & Development Control: Planning For Air Quality IAQM Development Control guidance (IAQM, 2017).

4.4 Appraisal Approach

Construction Dust Risk Assessment

4.4.1 There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined in the IAQM (2024) construction dust guidance. The methodology is summarised in the following paragraphs.

4.4.2 It should be noted that the purpose of the IAQM construction dust guidance is to define the level of mitigation that is required to effectively control construction dust. It therefore requires the assessor to determine the unmitigated risk of dust impacts on soiling and human health. This then allows the categorisation of risk of impacts from the various aspects of construction which in turn defines the level and nature of mitigation measures.

4.4.3 The risk of dust emissions from construction/demolition activities causing an adverse effect on human receptors depends on:

- The type of construction activities being undertaken, and the duration of these activities;
- The size of the construction site;
- The meteorological conditions (such as wind speed, wind direction and rainfall);
- The proximity of the receptors to the construction activities;
- The effectiveness of the dust deposition mitigation measures; and
- Receptor sensitivity to dust.

- 4.4.4 Construction activities on the Site are divided into four types to reflect their different potential impacts. These are demolition, earthworks, construction, and trackout (the vehicle-borne transfer of mud and debris onto the highway).
- 4.4.5 The potential for dust emissions was assessed for each activity that is likely to take place and considers two separate dust effects including annoyance due to dust soiling and the risk of health effects due to an increase in exposure to PM₁₀.
- 4.4.6 Table 4.5 summarises how the dust risk is calculated based on the dust emissions magnitude and the sensitivity of area for each of three impact pathways (dust soiling and human health).

Table 4.5 Dust risk for the Scheme is calculated based on the sensitivity of the Scheme and the dust emission magnitudes from associated construction activities

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction Activities			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

- 4.4.7 The IAQM construction dust guidance seeks to categorise the unmitigated risk of dust impacts on human health and amenity as a means of identifying proportional dust emissions mitigation required to ensure that residual impacts are no greater than negligible. A higher dust impact risk rating means that more stringent mitigation measures are required in order to avoid a residual significant risk of effects. These measures are then to be integrated into a Construction Environment Management Plan (OCEMP).

4.5 Limitations and Assumptions

4.5.1 The following limitations and assumptions have been identified for air quality:

- There is limited detail available for Non-Road Mobile Machinery (NRMM) during the construction and maintenance phases and regarding the potential use of diesel generators at this stage. It is assumed that emissions would be temporary and transient in nature and therefore negligible in terms of air quality impacts.
- The construction dust assessment assumes that earthworks and construction may take place on the land required to construct the Scheme. This is a conservative approach that has been adopted to ensure that potential impacts at receptors within 250m of the land required to construct the Scheme have been considered.
- It is assumed that exhaust emissions from plant will be minimised with the application of the mitigation measures detailed in Chapter 3.5 Air Quality of yje main EAR, Table 3.5.4.

5. Water Resources and Flood Risk Methodology

5.1 Legislation, Policy and Guidance

- 5.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Water Resources and Flood Risk in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Legislation

- 5.1.2 The following key legislation are of direct relevance to the appraisal of impacts of the Scheme.
- 5.1.3 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017 (as amended by The Floods and Water (EU Exit) Regulations 2019) implemented the Water Framework Directive (WFD) in England and Wales. The 2019 regulations, specifically Regulation 20, specify that the substance of the WFD regime that applied pre-EU Exit will continue to apply with only relatively minor amendments. The assessment identifies WFD waterbodies within the study area and appraises the potential for the Scheme to cause deterioration of these waterbodies.
- 5.1.4 The Land Drainage Act 1991 together with the Water Resources Act 1991 provide for the Environment Agency to prevent the obstruction of any main river through the construction of flow control structures, culverts, or any other structure in a main river. Where culverting or other works have a potential to affect the flow regime of ordinary watercourses, consent is required from the Lead Local Flood Authority (LLFA) under the Flood and Water Management Act 2010 which provides for more comprehensive management of flood risk for people, homes, and businesses. The Environmental Permitting (England and Wales) Regulations 2016 also impose certain controls in relation to the placing of structures and the carrying out of works affecting main rivers and other watercourses.
- 5.1.5 The Flood Risk Assessment has been prepared to assess the impacts of the Scheme on the flood regimes and floodplains of watercourses within the study area. Secondary consents for all relevant qualifying works will be secured from the Environment Agency and Lead Local Flood Authority under relevant legislation.

Policy

- 5.1.6 The NPPF (MHCLG, 2026) sets out Government policy on development and flood risk. Its objectives are to minimise risks to development arising from all sources of flooding and coastal change, taking into account the impacts of climate change, by steering development away from areas of risk, ensuring that development will be safe for its lifetime without increasing flood risk elsewhere, and incorporating sustainable drainage systems where appropriate.

Guidance

- 5.1.7 Several key sources have guided the Water Resources and Flood Risk appraisal.
- Design Manual for Roads and Bridges LA 113 Road Drainage and the Water Environment (Highways England, 2020) provides guidance on the assessment of the effects on infrastructure schemes on water environment receptors, including flood risk.
 - Flood Risk and Coastal Change Planning Practice Guidance (PPG) (MHCLG, 2022) provides advice regarding the potential impacts of climate change on rainstorm intensity and river flows, and how these should be factored into a site-specific FRA.
 - Various Construction Industry Research and Information Association (CIRIA) publications, for example, C532: Control of water pollution from construction sites (CIRIA, 2001), provide construction good practice for preventing pollution of the water environment.
 - Rotherham Metropolitan Borough Council Strategic Flood Risk Assessment (SFRA), as the Lead Local Flood Authority (LLFA) for Rotherham (Rotherham Metropolitan Borough Council, 2011), and the most recent update to the Preliminary Flood Risk Assessment (PFRA) in 2017 (Rotherham Metropolitan Borough Council, 2017): the PFRA and its addendum include information on local sources of flood risk, including past flood events and future flood risks, and informs the Local Flood Risk Management Strategy for Rotherham.

5.2 Study Area

- 5.2.1 The study area, defined in Appendix D, Long Lane New Overhead Lines Drawings; Figure 3.6.1 of the EAR, has been defined to include all surface water and groundwater receptors within 250m of the land required to construct the Scheme. This is considered an appropriate study area based on professional judgement and technical knowledge of similar schemes, and the nature of the Scheme construction and operational activities.

5.3 Surveys

- 5.3.1 No surveys were required in support of the Water Resources and Flood Risk appraisal.

5.4 Appraisal Approach

- 5.4.1 In order to identify the environmental impacts of the land required to construct the Scheme, a comparison of the current environmental conditions immediately before the Scheme is implemented (baseline) was compared to a prediction of how the environmental conditions are likely to change once the construction and operation of the Scheme has been undertaken. An iterative process was followed during appraisal to develop appropriate control measures to avoid or reduce potential environmental impacts.
- 5.4.2 Receptors have been identified, and their existing qualities characterised, using a range of desk study data sources. The potential for construction activities and the operation of the Scheme to impact these receptors has been identified by applying

the source-pathway-receptor principle. The proximity of receptors to construction works activities and the likelihood of them being physically disturbed or receiving discharges from the Scheme have been considered in assessing potential impacts and measures to avoid or reduce impacts have been identified.

Sources of Baseline Data

5.4.3 Baseline information on the water environment and flood risk from a range of sources within this area has been sourced from the following datasets:

- Flood Map for Planning - Flood Zones (Environment Agency, 2025);
- Risk of Flooding from Rivers and Sea (Environment Agency, 2025);
- Risk of Flooding from Surface Water (Environment Agency, 2025);
- Reservoir Flood Extents (Environment Agency, 2025);
- Groundwater Source Protection Zones and aquifers (Department for Environment, Food and Rural Affairs, 2017);
- EA Catchment Data Explorer (Environment Agency, 2025);
- British Geological Viewer (BGS) (British Geological Survey, 2025);
- Requested local abstraction and discharge data received June 2025 (Environment Agency EIR2025/03516);
- Environment Agency Statutory Main Rivers (Environment Agency, 2020); and
- Ordnance Survey (OS) Open Rivers (Ordnance Survey, 2025).

5.5 Limitations and Assumptions

5.5.1 No limitations and assumptions have been identified for the appraisal of water resource and flood risk.

6. Land and Ground Conditions Methodology

6.1 Legislation, Policy and Guidance

- 6.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Land and Ground Conditions in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Legislation

- 6.1.2 The Environmental Protection Act (EPA) 1990 defines, within England, Wales and Scotland, the structure and authority for waste management and control of emissions into the environment. The Act was intended to strengthen pollution controls and support enforcement with heavier penalties. Before the Act there had been separate environmental regulation of air, water and land pollution and the Act brought in an integrated scheme that would seek the 'best practicable environmental option'.
- 6.1.3 Part 2A of the EPA 1990 (which was inserted into that Act by section 57 of the Environment Act 1995) contains a regulatory regime for the identification and remediation of contaminated land. In addition to the requirements contained in the primary legislation, operation of the regime is subject to regulations and statutory guidance. The main objective underlying the introduction of the Part 2A contaminated land regime was to provide an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health or the wider environment, assessed in the context of the current use and circumstances of the land. The identification of contaminated land, as defined in Part 2A comprises a risk-based approach. For harm to the non-aquatic environment or pollution of controlled waters to occur, there must be a 'pollutant linkage'. This linkage is based on the following being present:
- A source of contamination (hazard);
 - A pathway for the contaminant that links the source to receptor; and
 - A receptor (target), which is affected by the contaminant. This includes humans, ecosystems, controlled waters, physical systems and built structures, which could be affected by the hazard.

Policy

- 6.1.4 The planning policy relevant to Ground Conditions and Contaminated Land and how this policy has been taken into account is provided in Table 6.1.

Table 6.1 Planning policy

Policy Document	Policy/Reference	Description in Relation to Ground Conditions and Contaminated Land	Scheme Response
National Planning Policy Framework (NPPF) (MHCLG, 2026)	P2	Requirement to ensure that a site should be suitable for its proposed use taking consideration of any risks from land contamination and land instability with appropriate assessment and mitigation, including land remediation. Statement on responsibility of developer and/or landowner to ensure the site development is 'safe' with respect to land contamination and stability.	The assessment considers the ground conditions and risks arising from land instability and contamination, including from natural hazards (including mining) and former activities.
Rotherham Metropolitan Borough Council Local Plan Sites and Policies 2018 (RMBC, 2018)	Policy SP 49 Safeguarding Mineral Infrastructure	Permission for non-minerals development involving, or within 250m of existing, planned or potential safeguarded mineral infrastructure sites will be granted where it can be demonstrated that: a) the infrastructure is no longer required or no longer meets the needs of the mineral or construction industry; or b) development will not prejudice the mineral infrastructure's operation or current or future use; or c) an alternative, appropriate, site provides capacity for delivery of the mineral infrastructure; or d) the need for the proposed development outweighs the need to safeguard the site for mineral infrastructure.	The assessment considers the potential for mineral resources and the policies map has been reviewed.
Rotherham Metropolitan Borough Council Local Plan Sites and Policies	Policy SP54: Contaminated and Unstable Land	Where land is known to be or suspected of being contaminated, or development may result in the release of contaminants from adjoining land, or there are adverse ground conditions caused by unstable land, development proposals should:	The assessment considers the potential impacts from the Scheme and proposed control measures to limit effects.

Policy Document	Policy/Reference	Description in Relation to Ground Conditions and Contaminated Land	Scheme Response
2018 (RMBC, 2018)		<p>a) demonstrate there is no significant harm, or risk of significant harm, to human health or the environment or of pollution of any watercourse or ground water;</p> <p>b) ensure necessary remedial action is undertaken to safeguard users or occupiers of the site or neighbouring land and protect the environment and any buildings or services from contamination during development and in the future;</p> <p>c) demonstrate that adverse ground conditions have been properly identified and safely treated; and</p> <p>d) clearly demonstrate to the satisfaction of the Local Planning Authority, that the land is suitable for its current or proposed use.</p>	

Guidance

6.1.5 The following guidance has informed the Land and Ground Conditions assessment:

- The Design Manual for Roads and Bridges (DMRB) guidance LA 109 Geology and Soils (Highways England, 2019) informed the approach to assigning sensitivity of receptors and magnitude of impacts with respect to ground conditions;
- Land Contamination Risk Management LCRM (Environment Agency, 2020) informed the evaluation of land contamination risks, following the 'source, pathway receptor' approach; and
- CIRIA Report 552 (C552) informed the evaluation of significance of effect.

6.2 Study Area

6.2.1 The study area for the Land and Ground Conditions appraisal, as seen in Appendix D, Long Lane New Overhead Line Drawings, Figure 3.7.1, comprises the land required to construct the Scheme, plus a 250m buffer on all sides. For ground conditions, the study area reflects the surrounding geological environment and considers the distance over which potential effects can reasonably be thought to have the potential to occur. For contamination, the study area is considered appropriate as this is the distance which potentially contaminative sites could cause more potential impact on the Scheme e.g., migration of gases from a landfill site, migration of contamination in the air, within groundwater, or surface water.

6.3 Surveys

- 6.3.1 The study area, has previously been subject to a Phase 1 Ground Conditions and Contaminated Land Desk Study Report by Arcadis (2025) with the findings of which have been utilised within this Appraisal to present the baseline conditions.
- 6.3.2 A site walkover survey was also undertaken during April 2024.

6.4 Sources of Baseline Data

- 6.4.1 The baseline review has been informed by the following publicly available resources and information provided by the Applicant.
- A review of the British Geological Survey (BGS) published geological sheet map (sheets 100 for Sheffield) and the BGS GeoIndex Viewer, including relevant archive borehole records;
 - Groundsure Enviro Insight Report (Groundsure reference: GS-O7Y-B7P-R8Q-QRM dated: 29/05/2026)
 - Groundsure Geo Insight Report (Groundsure reference: GS-KHN-1TT-EFE-6XK dated: 29/05/26)
 - Groundsure Geo Insight Report with Ordnance Survey Maps (Groundsure reference: GSIP-2024-14632-17543 dated: 01/03/2024) ;
 - Arcadis, 2025, Phase 1, Ground Conditions and Contaminated Land Assessment Desk Study Report, Long Lane, Document Ref: EDEU-ARC-ENV-REP-0013;
 - Mining Remediation Authority Consultants Coal Mining Reports, Ref. 51003373983001. 2023
 - Jacobs, Brinsworth 400kV New AIS Sub-Station- Mining Risk Assessment, Ref. B2441B05-JAC-BR-XX-RP-C-02104, 10 November 2023
 - Zetica website and Zetica Unexploded Ordnance (UXO) Pre-Desk Study Assessment;
 - Jacobs, Brinsworth – Ground Investigation, Report (GIR), Ref: B2441B05-JAC-BR-XX-RP-C-02106, 26 February 2025
 - Rotherham Metropolitan Borough Council Local Plan. Sites and Policies 2018, and
 - Rotherham Metropolitan Borough Council Policies Map accessed in July 2025 at [RMBC Mapping](#)
 - South Yorkshire Mineral Resources Map, 2006

6.5 Appraisal Approach

- 6.5.1 In order to identify the environmental impacts of the Scheme, a comparison of the current environmental conditions immediately before the Scheme is implemented (baseline) was compared to a prediction of how the environmental conditions are likely to change once the construction of the Scheme has been undertaken. An iterative process was followed during appraisal to develop appropriate control measures to avoid or reduce potential environmental impacts.

- 6.5.2 Operational phase contamination risks are scoped out. It is expected that any significant adverse effects from historical (pre-existing) ground and groundwater contamination that require mitigation will be either reduced to acceptable levels by the time the substation and overhead line infrastructure is operational or mitigated through design. Sensitive geological features and mineral resources will be considered as part of the appraisal in relation to the operation phase.
- 6.5.3 The Scheme will operate in accordance with standard operating procedures and legislative controls and wider standard operating procedures to prevent it being a potential source of contamination, so this aspect has also been scoped out.
- 6.5.4 A review of the baseline conditions and primarily the conceptual site model and preliminary risk assessment as is laid out in the desk study, and summarised above, have been utilised to identify potential receptors, with viable source-pathway-receptor linkages which have potential to impact the construction and operational phases of development. The preparations of the Phase 1 Desk Study for the Scheme have been undertaken in general accordance with the guidance provided in: BS 5930 Code of Practice for Ground Investigation; BS10175 Investigation of potentially contaminated sites – Code of Practice and EA (2020) Land Contamination Risk Management (LC:RM) guidance. Appropriate control measures are then presented in the Land and Ground Conditions Chapter to reduce or avoid any potential impacts that may occur in construction and operation phases of the scheme.

Significance Criteria

- 6.5.5 The adopted assessment methodology comprises a number of stages and has drawn from DMRB LA 109 (Highways England, 2019). The value of the identified receptors/resources have been assessed against the criteria shown in Table 6.2 below.

Table 6.2 Criteria for determining value/sensitivity of receptors/resources

Receptor Value (Sensitivity)	Description
Very high	<p>Contamination:</p> <p>Human Health: Very high sensitivity land use such as residential with gardens or allotments</p> <p>Surface Water: Watercourse having a Water Framework Directive (WFD) classification shown in a River Basin Management Plan (RBMP) and flow of $Q_{95} \geq 1.0\text{m}^3/\text{s}$; Site protected/ designated under European Commission (EC) or UK legislation (SAC, SPA, SSSI, Ramsar site, salmonid water)/ Species protected by EC legislation LA:108.</p> <p>Groundwater: Principal Aquifer providing a regionally important resource and/ or supporting a site protected under EC and UK legislation LA:108; Groundwater locally supports Groundwater Dependent Terrestrial Ecosystems (GWDTE); Groundwater Source Protection Zone (SPZ) 1.</p> <p>Geology:</p> <p>Very rare and of international importance with no potential for replacement (e.g. UNESCO World Heritage Sites, UNESCO Global Geoparks, SSSIs and Geological Conservation Review sites where citations indicate features of</p>

Receptor Value (Sensitivity)	Description
	international importance). Geology meeting international designation criteria which is not designated as such.
High	<p>Contamination:</p> <p>Human Health: High sensitivity land use such as public open space</p> <p>Surface water: Watercourse having a WFD classification shown in an RBMP and $Q95 < 1.0\text{m}^3/\text{s}$; Species protected under EC or UK legislation LA:108 (Highways England, 2020).</p> <p>Groundwater: Principal Aquifer providing locally important resource or supporting a river ecosystem; Groundwater supports a GWDTE; Groundwater SPZ 2 (Outer).</p> <p>Geology:</p> <p>Rare and of national importance with little potential for replacement (e.g. geological SSSI, National Nature Reserves). Geology meeting national designation criteria which is not designated as such.</p>
Medium	<p>Contamination:</p> <p>Human Health: Medium sensitivity land use such as commercial or industrial.</p> <p>Surface Water: Watercourses not having a WFD classification shown in an RBMP and $Q95 > 0.001\text{m}^3/\text{s}$.</p> <p>Groundwater: Aquifer providing water for agricultural or industrial use with limited connection to surface water; Groundwater SPZ 3.</p> <p>Geology:</p> <p>Of regional importance with limited potential for replacement (e.g. Regionally Important Geological Site). Geology meeting regional designation criteria which is not designated as such.</p>
Low	<p>Contamination:</p> <p>Human Health: Low sensitivity land use such as highways and rail.</p> <p>Surface Water: Watercourses not having a WFD classification shown in an RBMP and $Q95 \leq 0.001\text{m}^3/\text{s}$.</p> <p>Groundwater: Unproductive Strata.</p> <p>Geology:</p> <p>Of local importance/interest with potential for replacement (e.g. non-designated geological exposures, former quarries/mining sites).</p>
Negligible	<p>Contamination:</p> <p>Human Health: Undeveloped surplus land/ no sensitive land use proposed.</p> <p>Geology:</p> <p>No geological exposures, little/no local interest.</p>

- 6.5.6 In consideration of human health, the duration and frequency of exposure to contamination and number of pathways of exposure to contamination increases from commercial/industrial (minimum) to residential with private garden (maximum) land uses, when considering land uses with a regular human presence. Therefore, future users of industrial sites are considered to be of low sensitivity as they would have minimal contact with underlying soil, whilst residential end users are likely to be in contact with underlying soil on a more regular basis and are therefore attributed very high sensitivity/value.
- 6.5.7 The magnitude of impacts has been determined using the criteria outlined in Table 6.3 below.

Table 6.3 Criteria for determining the scale of impact

Magnitude of Impact	Definition
Major Adverse	<p>Geology – The Scheme is very damaging to the geological environment/ soil resource of the study area; may result in loss of or damage to areas designated as being of regional or national geodiversity value; and the effects cannot be mitigated.</p> <p>Human Health – Significant harm to a designated receptor (e.g. human health) is likely to arise from an identified hazard at the site without appropriate remedial action.</p> <p>Hydrogeology – Loss of, or extensive change to an aquifer used for potable supply, potential high risk of pollution of groundwater.</p> <p>Hydrology – Major decrease in water quality; loss or extensive change to a fishery, loss or extensive change to a designated Nature Conservation Site</p> <p>Buildings and Infrastructure – Catastrophic damage to buildings, structures or the environment.</p>
Moderate Adverse	<p>Geology – The Scheme may result in the loss of or damage to areas designated as being of national and/ or regional geodiversity value within the study area. Some mitigation may be possible but would not prevent damage to the geological environment, as some features of interest would be lost or partly destroyed.</p> <p>Human Health – It is possible that without appropriate remedial action, significant harm to a designated receptor (e.g. human health) could arise to a designated receptor but it is relatively unlikely that any such harm would be severe and if any harm were to occur, it is likely that such harm would be relatively mild.</p> <p>Hydrogeology – Partial loss or change to an aquifer, potential medium risk of groundwater pollution. Partial loss of the integrity of groundwater supported designated wetlands.</p> <p>Hydrology – Moderate decrease in water quality; partial loss in productivity of a fishery.</p> <p>Buildings – Significant damage to buildings, structures or the environment</p>
Minor Adverse	<p>Geology – The Scheme would not affect areas with regional or national geodiversity value but may result in the loss of or damage to areas of local geodiversity value. The effects cannot be completely mitigated but opportunities exist for local enhancement of geodiversity value.</p>

Magnitude of Impact	Definition
	<p>Human Health – It is possible that harm could arise to a designated receptor (e.g. human health) from an identified hazard but it is likely that at worst this harm if realised would normally be mild.</p> <p>Hydrogeology – No significant change to an aquifer, potential low risk of pollution to groundwater. Minor effects on groundwater supported wetlands</p> <p>Hydrology – Slight decrease in water quality</p> <p>Buildings – Minor damage to sensitive buildings, structures services or the environment.</p>
Negligible Adverse	<p>Geology – The Scheme would result in very minor loss of geodiversity value of local areas of geological interest/soils resource such that mitigation is not considered practical.</p> <p>Human Health – There is a low possibility that harm could arise to a designated receptor. In the event of such harm being realised, it is likely to be mild or minor.</p> <p>Hydrogeology – The Scheme is unlikely to affect the integrity of the water environment.</p> <p>Hydrology – Negligible decrease in water quality</p> <p>Buildings – Easily repairable effects of damage to buildings or structures</p>
No Change	No observable effect either adversely or beneficially.
Negligible Beneficial	<p>Geology – The Scheme would be of minor benefit to geodiversity value by potentially providing greater exposure and or protection. The Development may resolve minor impact from existing land or water contamination.</p> <p>Contaminated Land – The Scheme may resolve slight impact from existing land or water contamination.</p>
Minor Beneficial	<p>Geology – The Scheme may result in the exposure of geological formations that may become of significant local interest.</p> <p>Contaminated Land – The Scheme may resolve minor impact from existing land or water contamination.</p>
Moderate Beneficial	<p>Geology – There is benefit to the geodiversity value of the geological/soil resource of the area as a result of the Scheme. The Scheme may result in the exposure of geological formations that may become of significant regional interest. The Scheme may resolve moderate impact arising from existing land or water contamination.</p> <p>Contaminated Land – The Scheme may resolve moderate impact arising from existing land or water contamination.</p>
Major Beneficial	<p>Geology – The Scheme is very beneficial to the geodiversity value of the geological/ soil resource of the area. The Scheme may result in the exposure of geological formations that may become of significant regional and or national interest. The Scheme may resolve major impact arising from existing land or water contamination. Note; although very few projects are likely to meet this criterion, enhancement of the SSSI presents such an opportunity.</p> <p>Contaminated Land – The Scheme may resolve major impact arising from existing land or water contamination.</p>

- 6.5.8 The determination of level of the effect is a factor of the value/sensitivity of the feature/resource (receptor) and the magnitude of the impact (change) as described above. Table 6.4 shows how the level of effect is derived.

Table 6.4 Determination of the level of effects

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

- 6.5.9 Level of effects which are Very Large, Large, Moderate/Large or Moderate are considered to be significant for the purposes of EIA / EAR. Effects which are considered to be slight or neutral are considered to be non-significant and would not require further consideration.

6.6 Limitations and Assumptions

- 6.6.1 The appraisal has been based on available information referenced within this Chapter. Further ground investigation may be required to inform detailed design.

7. Noise and Vibration Methodology

7.1 Legislation, Policy and Guidance

- 7.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Noise and Vibration in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Policy

- 7.1.2 The following planning policies are of relevance to the appraisal of Noise and Vibration for the Scheme:

- The NPPF (MHCLG, 2026); and
- Noise Policy Statement for England (NPSE) (DEFRA, 2010).

- 7.1.3 A summary of the relevant information with respect to Noise and Vibration contained within the planning documentation listed above is presented below.

National Planning Policy Framework

- 7.1.4 The NPPF sets out the Government's planning policies for England and how these should be applied. The NPPF does not contain assessment design targets, instead providing a series of policies, giving local authorities the flexibility in meeting the needs of local communities. The NPPF states at P3 that:

"Development proposals should be appropriate for their location, taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, whether these effects are on or off-site; and whether this is as a result of the development itself or the product of preexisting conditions in its vicinity. In assessing the potential effects of pollution, consideration should be given to the potential sensitivity of the site, and its intended occupiers and users, as well as that of the environment and population in the surrounding area (including where certain groups could be particularly vulnerable to its effects, such as children and older people)."

- 7.1.5 Within this context development proposals should:

a) Provide healthy living conditions for occupiers and users in terms of adequate access to light and avoiding exposure to levels of air, noise, artificial light or other sources of pollution which could have an unacceptable adverse effect on health and the quality of life. Where necessary suitable mitigation measures should be incorporated to secure acceptable living conditions;

b) Not give rise to, or contribute to, an unacceptable level of access to daylight and sunlight for neighbouring residents and occupiers, or unacceptable levels of air, noise, artificial light, water, soil or other forms of pollution on or beyond the site. Adverse impacts of this nature should be avoided where possible, or else mitigated to an acceptable degree. Where possible, opportunities should be taken to reduce

pollution affecting the wider area (such as through traffic and travel management or improved external lighting);

d) Mitigate and reduce to a minimum potential adverse impacts resulting from noise, not result in levels of noise exposure which would have a significant observed adverse effect, and maintain the character of tranquil areas (those areas that have remained relatively undisturbed by noise from human sources and are prized for their recreational and amenity value for this reason); and

e) Limit any adverse impact from artificial light on local amenity, intrinsically dark landscapes (those areas entirely, or largely, uninterrupted by artificial light) and nature”.

Noise Policy Statement for England (NPSE)

- 7.1.6 The NPSE was published on 15 March 2010. It sets out the long-term vision of government noise policy, to promote good health and a good quality of life through the management of noise.
- 7.1.7 The NPSE should apply to all forms of noise including environmental noise, neighbour noise and neighbourhood noise. The NPSE does not apply to noise in the workplace (occupational noise).
- 7.1.8 The NPSE sets out the long-term vision of Government noise policy which is to:
‘Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.’
- 7.1.9 This long-term vision is supported by the following aims, through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:
- avoid significant adverse impacts on health and quality of life;
 - mitigate and minimise adverse impacts on health and quality of life; and
 - where possible, contribute to the improvement of health and quality of life.
- 7.1.10 The aim of the NPSE is to provide clarity regarding policies and practices to enable noise management decisions to be made within the wider context, at the most appropriate level, in a cost-effective manner and in a timely fashion.
- 7.1.11 There are established concepts being applied to noise impacts and which are presented in the NPSE. They are:
- NOEL – No Observed Effect Level: This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise;
 - LOAEL – Lowest Observed Adverse Effect Level: This is the level above which adverse effects on health and quality of life can be detected; and
 - SOAEL – Significant Observed Adverse Effect Level: This is the level above which significant adverse effects on health and quality of life occur.
- 7.1.12 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also considering the guiding principles of sustainable development.

- 7.1.13 The second aim of the NPSE refers to the situation where the impact lies somewhere between LOAEL and SOAEL. It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also considering the guiding principles of sustainable development. This does not mean that such adverse effects cannot occur.
- 7.1.14 The third aim of the NPSE seeks, where possible, to improve health and quality of life through the pro-active management of noise while also considering the guiding principles of sustainable development, recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

Guidance

- 7.1.15 The following guidance is of relevance to the appraisal of Noise and Vibration for the Scheme:
- Planning Practice Guidance for noise (MHCLG, 2014); and
 - BS 4142:2014+A1:2019 – ‘Methods for Rating and Assessing Industrial and Commercial Sound’ (BSI, 2019).

Planning Practice Guidance – Noise

- 7.1.16 The Planning Practice Guidance for noise was published in March 2014 and updated in July 2019.
- 7.1.17 Noise needs to be considered when development may create additional noise or would be sensitive to the prevailing acoustic environment, including any anticipated changes to that environment from activities that are permitted but not yet commenced.
- 7.1.18 Table 7.1 below, summarises the noise exposure hierarchy presented in the PPG.

Table 7.1 National Planning Practice Guidance noise exposure hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level (NOEL)			
Not present	No effect	No Observed Effect	No specific measure required
No Observed Adverse Effect Level (NOAEL)			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measure required
Lowest Observed Adverse Effect Level (LOAEL)			

Response	Examples of Outcomes	Increasing Effect Level	Action
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g., avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g., regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

BS 4142:2014+A1:2019 – ‘Methods for Rating and Assessing Industrial and Commercial Sound’

- 7.1.19 BS 4142:2014+A1:2019 (BSI, 2019) describes methods for rating and assessing sound of an industrial and/or commercial nature.
- 7.1.20 This includes sound from industrial and manufacturing processes, including sound from fixed installations comprising mechanical and electrical plant and equipment.
- 7.1.21 The methods described in BS 4142:2014+A1:2019 use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

- 7.1.22 BS 4142:2014+A1:2019 assesses the likelihood of any adverse impact from proposed or existing industrial/commercial activities on existing or proposed noise sensitive receptors (NSRs).
- 7.1.23 To assess the potential impact, the measured background sound level at the closest NSR or at a representative location, is arithmetically subtracted from the rating level. This is the specific sound source level of the assessed source corrected for acoustical characteristics that may make the sound more subjectively noticeable to the NSRs.
- 7.1.24 The method in BS 4142:2014+A1:2019 is based on the difference between the measured background sound level, without the influence of any industrial noise source assessed, and the rating level of the industrial source assessed, at the receiver location.
- 7.1.25 The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs.
- 7.1.26 Typically, the greater the difference between the background sound level and the rating level, the greater the magnitude of the impact.
- 7.1.27 A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- 7.1.28 A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- 7.1.29 The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- 7.1.30 Regarding the context, BS 4142:2014+A1:2019 (BSI, 2019) states the following:
'An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context.'
- 7.1.31 Main specific terms used in BS 4142:2014+A1:2019 are presented below:
- Ambient sound level, $L_a = L_{Aeq,T}$
 - equivalent continuous A-weighted sound pressure level, L_{Aeq} , of the totally encompassing sound in a given situation at a given time, usually from many sources near and far, at the assessment location over a given time interval, T. The ambient sound level is a measure of the residual sound and the specific sound when present.
 - Background sound level, $LA_{90,T}$
 - A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting, F, and quoted to the nearest whole number of decibels.
 - Residual sound level, $L_r = L_{Aeq,T}$

- ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound.
 - Specific sound level, $L_s = LA_{eq,Tr}$
 - equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, Tr .
 - Rating level, $L_{ar,Tr}$
 - specific sound level plus any adjustment for the characteristic features of the sound.
- 7.1.32 The background sound level is an underlying level of sound over a period, T , and might in part be an indication of relative quietness at a given location. It does not reflect the occurrence of transient and/or higher sound level events and is generally governed by continuous or semi-continuous sounds.
- 7.1.33 The background sound level should be measured at the assessment location(s), where possible. Where this is not possible, an alternative location, representative of the assessment locations, can be used.
- 7.1.34 The measurement time interval should be sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 minutes intervals, which can be contiguous or disaggregated.
- 7.1.35 The specific sound level needs to be determined at the assessment location(s) as a discrete entity, distinct and free of other influences contributing to the ambient sound. BS 4142:2014+A1:2019 (BSI, 2019) suggests that the specific sound needs to be evaluated over an appropriate reference time interval, 1 hour during daytime and 15 minutes during night-time.
- 7.1.36 The daytime period is defined as the hours ranging from 07:00 to 23:00. The night-time period comprises the hours from 23:00 to 07:00.
- 7.1.37 BS 4142:2014+A1:2019 states that, where possible, the specific sound level by measurement of the ambient sound level and the residual sound level needs to be determined at the assessment location(s).
- 7.1.38 Where determining the specific sound level by direct measurement is not practicable, for example in the case of a source not yet in operation, the method of calculation has to be reported and justified in detail.
- 7.1.39 The rating level in BS 4142:2014+A1:2019 depends on certain acoustic features that can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level.
- 7.1.40 Where such features are present at the assessment location, a character correction is added to the specific sound level to obtain the rating level.
- 7.1.41 BS 4142:2014+A1:2019 states that it is typically feasible to undertake a subjective assessment of characteristics, based on the correction guidelines, as follows:
- Tonality: +2dB for a 'just perceptible' tone, +4dB for 'clearly perceptible', +6dB for 'highly perceptible' tones;

- Impulsivity: +3dB for 'just perceptible' impulsivity, +6dB for 'clearly perceptible', rising to +9dB for 'highly perceptible' impulsivity;
- Intermittency: if the on/off-time of the specific sound is readily distinctive at the NSRs, a +3dB character correction is added; and,
- Other sound characteristics: where the noise source features characteristics that are neither tonal nor impulsive, nor intermittent, though otherwise are readily distinctive against the residual acoustic environment, a penalty of +3dB can be applied.

- 7.1.42 If characteristics likely to affect perception and response are present in the specific sound, within the same reference period, then the applicable corrections ought normally to be added arithmetically.
- 7.1.43 However, if any single feature is dominant to the exclusion of the others, then it might be appropriate to apply a reduced or even zero correction for the minor characteristics.
- 7.1.44 Given that transformers are industrial noise sources in nature, it is therefore considered that the methodology based on BS 4142:2014+A1:2019, 'Methods for rating and assessing industrial and commercial sound' is the most appropriate guidance to follow and consequently has been adopted for the assessment of the potential noise breakout from the site at the identified NSRs, with the intention to design rating levels at or below background sound levels at NSRs.

7.2 Study Area

- 7.2.1 Given the nature of the Scheme, the study area for Noise and Vibration comprises the land required to construct the Scheme, including the land required for the New 400kV Long Lane Substation, and 200m either side of the proposed overhead lines as well as those to be retained.

7.3 Surveys

- 7.3.1 No surveys were undertaken for the Scheme.
- 7.3.2 Baseline sound levels at the Site of the New 400kV Long Lane substation have been established by means of an automated noise survey completed between 30 April and 13 May 2024, considered representative of the most exposed receptors.

7.4 Appraisal Approach

- 7.4.1 Operational noise impacts are most likely to be associated with the new 400kV substation proposed alongside the Scheme. This substation has been appraised and consented separately (insert planning app ref), Information about the operational noise impacts of the new 400kV substation is therefore presented as part of this appraisal alongside the appraisal of noise from the operation of overhead lines.
- 7.4.2 Given the context of the Scheme centred east of the existing Brinsworth Substation and around the proposed new 400kV Long Lane substation, and the nature of the Scheme, comprising removal and installation of pylons and overhead lines only, the Noise Impact Assessment undertaken for the new 400kV Long Lane substation has been used to evidence the appraisal of impacts on noise and vibration.

- 7.4.3 In order to identify the environmental impacts, a comparison of the current environmental conditions (baseline) was compared to a prediction of how the environmental conditions are likely to change once the construction and operation has been undertaken. An iterative process was followed during appraisal to develop appropriate control measures to avoid or reduce potential environmental impacts. Further details of the appraisal approach can be found in Appendix F, Noise Impact Assessment.

Background Noise Levels

- 7.4.4 During night-time periods, the background sound levels are lower than the daytime background sound levels, and as the supergrid transformers (SGTs) operate 24/7, this makes the night-time period a more onerous assessment. Therefore, only the night-time assessment is presented in the noise assessment.
- 7.4.5 Based on the analysis of the background levels presented above, a representative background sound level of 46dB(A) has been selected for the receptors.
- 7.4.6 In line with BS 4142:2014+A1:2019 (BSI, 2019), a typical background sound level should be selected and should not automatically be assumed to be the minimum value. The typical background sound level presented above has been carefully selected based on the statistical cumulative percentage analysis, which indicates that background sound levels will typically exceed the chosen representative sound levels approximately 70-75% of the time.
- 7.4.7 In light of the above it is considered that the selected background sound levels are conservative and will aid in providing a robust assessment.

Noise Sources Scoped Out of the Appraisal

- 7.4.8 The residual impacts of construction noise and vibration have been scoped out of this EAR on the basis that this will be mitigated through the implementation of a Noise and Vibration Management Plan, via a CEMP and due to the temporary nature of the construction impact. Operational maintenance activities will also be managed by the implementation of noise and vibration management measures.
- 7.4.9 The following operational noise sources have been scoped out of the appraisal:
- overhead lines, as set out in section 3.8 of the main EAR;
 - operational traffic, given the very low levels of traffic that would be generated during maintenance only.

SGT Sound Power Levels

- 7.4.10 Sound power levels from the SGTs of the new 400kV Long Lane substation have been derived from National Grid's Technical Specification 2.03, Power Transformers and Reactors, TS 2.03, Issue 7, June 2021. This document specifies the maximum sound power level for transformer units under specific operating conditions, in accordance with IEC 60076-10, Power transformers - Part 10: Determination of sound levels.
- 7.4.11 The rated power of the proposed SGTs is 1100MVA. From previous assessments of SGTs with >1000MVA power, sound power levels of up 97dB(A) have been used, therefore a sound power level of 97dB(A) has been used for the 1100MVA SGTs.

Noise Model

- 7.4.1 The specific sound level at the NSRs have been calculated using a 3D sound model using acoustic modelling software Datakustik CadnaA. This software's calculation method is based on ISO 9613-2:1996 and considers the distance between source and receiver including reflection or screening effects from buildings.
- 7.4.2 An additional acoustic model was then created where the sound power levels of the SGTs have been adjusted with the use of acoustic enclosures.
- 7.4.3 Further details on the acoustic models and the results can be found in Appendix F, Noise Impact Assessment.

7.5 Limitations and Assumptions

- 7.5.1 The background sound levels derived from the acoustic survey for the assessment are considered to be suitably representative for surrounding receptors. The weather conditions were continuously monitored during the unattended measurement using a weather station and those periods with wind speeds higher than 5m/s, and/or rainfall as discussed in BS 4142:2014+A1:2019 (BSI, 2019) were discarded from the dataset for the assessment.
- 7.5.2 Source sound power levels have been based on higher voltages and loads than would typically occur, at 102.5% voltage and 50% load from the National Grid Technical Specification document.
- 7.5.3 Specific noise levels have been calculated using a 3D sound model and rated noise levels have considered character corrections.
- 7.5.4 Based on the aforementioned, it is considered that the uncertainty of the measurements, the determination of the background levels, and calculations for the NIA have minimal influence on the outcome of the assessment.

8. Traffic and Transport Methodology

8.1 Legislation, Policy and Guidance

- 8.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Traffic and Transport in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Legislation

- 8.1.2 This section identifies the legislation in the context of traffic and transport, which includes the Highways Act 1980, Transport Act 2000 and Environment Act 2021.

Highways Act 1980

- 8.1.3 The Highways Act 1980 outlines the duties of the highway authorities, and the management and operation of the highway network. The legislation most relevant to Chapter 3.9, Traffic and Transport of the EAR, include 'Improvement of Highways', which is covered in Part V, and 'Environmental Impact Assessments', which is covered in Part VA.

Transport Act 2000

- 8.1.4 The Transport Act 2000 includes measures to create a more integrated transport system with the aim of improving local passenger transport services, alongside reducing congestion and pollution. This is exemplified by the requirement for local authorities to prepare, publish and review a local transport plan to achieve the outlined aims of this legislation. These plans have been taken into consideration in the assessment of Traffic and Transport.

Environment Act 2021

- 8.1.5 The Environment Act 2021 amends the Environment Act 1995. It establishes the Environment Agency and provides a framework for environmental protection and improvement including the impacts of transport.

Policy

National Policy Statements (NPS)

- 8.1.6 The Overarching National Policy Statement for Energy (EN-1) (DESNZ, 2025) outlines the necessity for a Transport Assessment (TA) if the Project is likely to have significant transport implications. This is supported by NPS EN-5 (DESNZ, 2025).
- 8.1.7 In particular, EN-1 Section 5.14 discusses transport impacts and states that energy projects have the potential to have a variety of impacts on Traffic and Transport. These have been considered and are detailed below.

- 8.1.8 National Policy Statement EN-1 states at Paragraph 5.14.1 *‘The transport of materials, goods and personnel to and from a development during all project phases can have a variety of impacts on the surrounding transport infrastructure and potentially on connecting transport networks, for example through increased congestion. Impacts may include economic, social and environmental effects’.*
- 8.1.9 Paragraph 5.14.4 states *‘The consideration and mitigation of transport impacts is an essential part of Government’s wider policy objectives for sustainable development as set out in Section 2.6 of this NPS’.*
- 8.1.10 Paragraph 5.14.12 states *‘Where mitigation is needed, possible demand management measures must be considered. This could include identifying opportunities to:*
- *reduce the need to travel by consolidating trips*
 - *locate development in areas already accessible by active travel and public transport*
 - *provide opportunities for shared mobility*
 - *re-mode by shifting travel to a sustainable mode that is more beneficial to the network*
 - *retime travel outside of the known peak times*
 - *reroute to use parts of the network that are less busy’*
- 8.1.11 Paragraph 5.14.13 states *‘If feasible and operationally reasonable, such mitigation should be required, before considering requirements for the provision of new inland transport infrastructure to deal with remaining transport impacts. All stages of the project should support and encourage a modal shift of freight from road to more environmentally sustainable alternatives, such as rail, cargo bike, maritime and inland waterways, as well as making appropriate provision for and infrastructure needed to support the use of alternative fuels including charging for electric vehicles’.*
- 8.1.12 Paragraph 5.14.21 states that *‘The Secretary of State should only consider refusing development on highways grounds if there would be an unacceptable impact on highway safety, residual cumulative impacts on the road network would be severe, or it does not show how consideration has been given to the provision of adequate active public or shared transport access and provision’.*
- 8.1.13 Section 2.5 of National Policy Statement for Electricity Networks Infrastructure (EN 5) is also relevant to this Scheme. Paragraph 2.5.1 states that *‘When planning and evaluating the proposed development’s contribution to environmental and biodiversity net gain, it will be important – for both the applicant and the Secretary of State – to supplement the generic guidance set out in EN-1 (Section 4.6) with recognition that the linear nature of electricity networks infrastructure can follow for excellent opportunities to:*
- *reconnect important habitats via green corridors, biodiversity stepping zones, and reestablishment of appropriate hedgerows; and/or*
 - *connect people to the environment, for instance via footpaths and cycleways constructed in tandem with environmental enhancements.’*

- 8.1.14 The Scheme would not permanently impact or change existing highway infrastructure or PRowWs. It has been assumed that temporary PRow diversions and Haul Roads will be removed following construction. However, discussions with the Local Highways Authority (LHA) could be undertaken to identify locations where it may be favourable to retain such infrastructure.

National Planning Policy Framework

- 8.1.15 The NPPF (MHCLG, 2026) sets out the Government's planning policies for England and how these are expected to be applied. The NPPF provides a framework within which locally prepared plans for housing and other development can be produced.
- 8.1.16 Chapter 15 sets out the objectives to promoting sustainable transport, ensuring transport is fully considered in planning and development decisions using a vision-led approach to identify transport solutions that deliver sustainable places. The relevant objectives have been laid out in this report:

TR1: Vision-led approach to planning for transport :

- Early engagement with local communities, transport authorities and other stakeholders should inform development proposals, ensuring they reflect local needs and transport evidence. Plans should also align with wider strategies;
- Making use of The Connectivity Tool to see where proposed development can support sustainable patterns of movement and make use of existing / proposed transport infrastructure;
- Identify sites and routes which will widen transport choices and support active travel; and
- Providing for any transport facilities, such as ports, public transport hubs and electric vehicle charging, that need to be located in the area or for expansion and wider developments.

TR3: Locating development in sustainable locations:

- Prioritise development in sustainable locations that reduce reliance on private cars and provide access to a range of transport options;
- Mitigate significant impacts from the development on the transport network to an acceptable degree using a vision-led approach;
- Identify and assess environmental impacts of transport; and

TR6: Assessing transport impacts:

- Developments that are likely to generate significant amounts of movement should be supported by a transport statement / assessment and a travel plan;
- They should reflect the transport vision for the development and the transport strategy for the area which it is located;
- Reasonable future scenarios should be considered and account for potential cumulative impacts, multimodal trip generation and the promotion of sustainable travel; and

- If development proposals have a severe impact on the transport network, they should be refused.

TR8: Public rights of way:

- Development proposals should protect and enhance the network of public rights of way; and
- Development proposals should take opportunities to extend, link or improve the quality of existing routes, including by improving access to green spaces, enabling direct routes between footpaths and cycle routes, creating safe, accessible and convenient links to services, and enhancing connections to public transport stops.

Rotherham Transport Strategy, 2016-2026

- 8.1.17 The Rotherham Transport Strategy (RMBC, 2016) covers the period between 2016 and 2026, addressing two challenges. This includes supporting the economic recovery of the borough, and adapting to and reducing the transport systems impacts on safety, health and climate change. The purpose of this strategy is to establish the boroughs transport policy and a plan for the transport network up to 2026.
- 8.1.18 The vision of this strategy is that in 2026, Rotherham will:
- enjoy sustainable growth as new developments will consist of mixed-used centres, focusing on high-quality public transport;
 - be a connected place, connecting people and places by an integrated, safe and efficient transport network; and
 - make sustainable travel choices by making walking, cycling and public transport a normal part of daily travel.
- 8.1.19 The transport strategy has the following objectives:
- integrated transport and land use, with the aim of supporting new developments to ensure people/places are well connected and public transport, walking and cycling are accessible;
 - public transport network improvement to provide a viable alternative to using cars;
 - creation of a transport network which is safe and attractive for active travel modes (walking and cycling);
 - development and management of an efficient road network for the movements of people and freight; and
 - the creation of a transport network that is safe for everyone.
- 8.1.20 In relation to the road and freight objective the following themes and actions have been identified, which would link to the Scheme:
- *‘To reduce the amount of productive time lost on the strategic and local road network and to improve its resilience and reliability;*
 - *To ensure networks are well maintained;*
 - *To promote efficient and sustainable means of freight distribution; and*

- *To work to improve the efficiency of vehicles and reduce carbon emissions and to improve air quality, especially in designated areas.'*

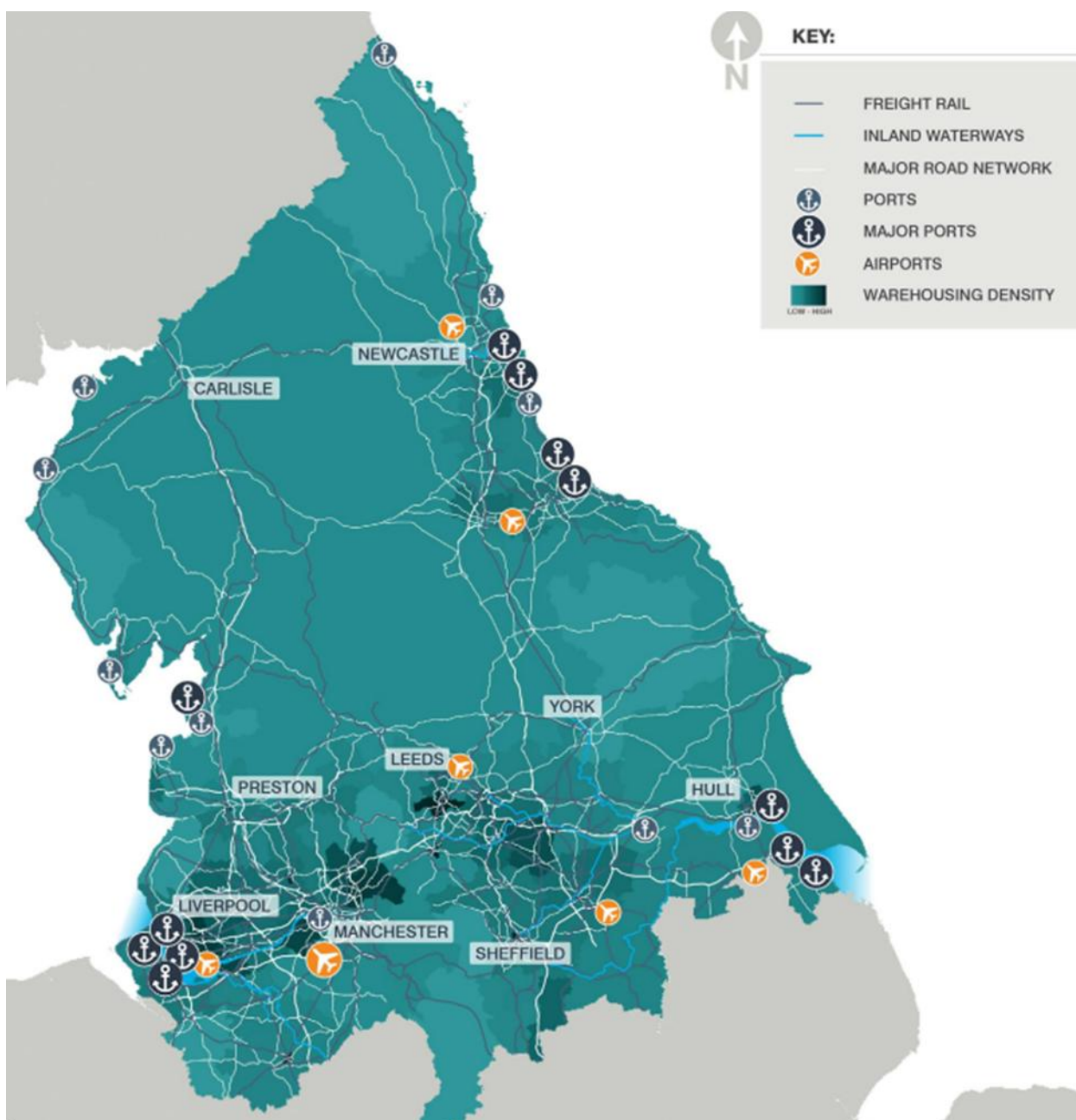
Rotherham Local Plan, Core Strategy 2013-2028

- 8.1.21 The Core Strategy outlined the high-level strategy and policies as a guidance for change in Rotherham up to 2028. The following policies forming part of the Core Strategy are relevant to the Scheme:
- Policy CS 15 Key Routes and the Strategic Road Network - referring to providing efficient access between the main Rotherham Urban Area, Principal Settlements and the regional and national road network. Specifically mentioning '*concentrating road based freight onto those key routes where it would not have an unacceptable impact on local communities.*'
 - Policy CS 18 Freight – '*the Council will promote improvements to the freight network accruing from strategic road and rail improvements especially for links to the Humber Ports and the north via the M1/M62 Managed Motorways proposals...The impact of the movement of road based freight will be minimised through the concentration of freight onto key routes.*'

Freight & Logistics Strategy (Transport for the North, 2022)

- 8.1.22 This is the first pan-Northern Freight & Logistics Strategy, which builds upon the Strategic Transport Plan to develop a multimodal freight strategy for the North of England, which would meet the current and future needs. The main issues identified in this strategy include network capacity and capability, terminal availability, and decarbonisation.
- 8.1.23 The key objectives of this strategy are as follows:
- 8.1.24 The investigation and implementation of alternative fuel technologies for transportation;
- Supporting the further electrification of the rail network; and
 - Supporting the creation of additional terminals on rail and inland waterway networks, and address network issues on this network. This would encourage the modal shift from road to rail and water where possible.
- 8.1.25 The key transport infrastructure in the North of England is present in Figure 8.1 below.

Figure 8.1 Key Transport Infrastructure - North of England



Sheffield City Region Transport Strategy

- 8.1.26 The Sheffield City Region Transport Strategy (Sheffield City Region Mayoral Combined Authority, 2018) outline the transport priorities for the region up to the year 2040. The vision is:

‘for the future is that we will build a transport system that works for everyone, connecting people to the places they want to go within the City Region as well as nationally and internationally. Our transport system will be safe, reliable, clean, green and affordable. It will be one of the best in the United Kingdom and Europe.’

- 8.1.27 The goal of the strategy primarily applies to South Yorkshire; however it recognises the importance of the wider Sheffield City Region, in which Rotherham has been identified as being a part of and referred to as a regional hub. Therefore, it includes interventions that would be beneficial to neighbouring Combined and Local Authority areas.

- 8.1.28 The strategy highlights the need for planning to ensure goods can be delivered whilst reducing the impact of freight traffic on local communities. Additionally, the strategy addresses the needs of implementing better driving standards to mitigate these impacts.

Guidance

- 8.1.29 Several key sources have guided the Traffic and Transport appraisal.

Design Manual for Roads and Bridges (DMRB) LA 104 Environmental Assessment and Monitoring (2020) (Highways England, 2020)

- 8.1.30 This document outlines the requirements for environmental assessments of projects, which includes the reporting and monitoring of potential environmental effects. The assessment of environmental effects, reporting of assessments and monitoring of environmental effects, aligns with the requirements of the Directive 2011/92/EU as amended by 2014/52/EU.
- 8.1.31 The document covers environmental assessment methodology, including assigning value to receptors, and magnitude of impact.

Environmental Assessment of Road Traffic ('IEMA Guidelines') (IEMA, 2023)

- 8.1.32 The outlined guidelines are for the assessment of the environmental impact of road traffic associated with major new development. The objective is to provide the basis for a systematic, consistent and comprehensive coverage for the assessment of traffic impacts arising from development projects. This will enable potential problems and possible solutions to be identified at an early stage.
- 8.1.33 The environmental assessment process should run throughout the planning and design stages of the projects. A checklist of the environmental effects which includes traffic noise, disruptions, pedestrian and cyclist impacts, and accidents and safety are contained in Section 2.
- 8.1.34 Within Section 3, traffic issues have been covered. This includes the impact of traffic relating to volume, traffic speeds and operational factors, and traffic compositions, but also the perception of changes in traffic by humans and the impact on ecological systems. The assessment of the environmental impacts due to the associated traffic requires the following:
- determination of the existing and forecasted traffic levels, including the characteristics;
 - determination of the time period suitable for assessment;
 - determining the assessment year; and
 - identifying the geographical boundaries required for assessment.
- 8.1.35 Where possible, the ES should outline alternative sites considered, including the impacts and the reason for selecting the preferred site.

Transport Evidence Bases in Plan Making and Decision Taking (MHCLG, 2015)

- 8.1.36 This guidance is to help local planning authorities assess and reflect strategic transport needs in Local Plan making. The transport evidence base should identify

the opportunities to encourage a modal shift towards sustainable transport usage. This will also enable transport impacts of developments to be assessed and in turn inform sustainable approaches. This guidance highlights the information required and what information needs to be considered when undertaking a transport assessment.

Travel Plans, Transport Assessments and Statements (MHCLG, 2014)

- 8.1.37 This guidance provides support regarding Travel Plans, Transport Assessments, and Transport Statements relating to decision-making. This guidance outlines when these documents are required, in addition to what each of these should contain.
- 8.1.38 Travel Plans, Transport Assessments and Statements assess and mitigate the transportation impacts arising from development projects, and they promote sustainable development. They are all required for development which produce substantial traffic movements.
- 8.1.39 Assessments should be based on normal traffic flow and usage conditions, although it may be required to consider the implications of peak traffic flows. Any projections should use local traffic forecasts. The timeframe of the assessments should be agreed with the relevant local planning authorities in consultation with the relevant transport network operators and service providers.

8.2 Study Area

- 8.2.1 The study area for Traffic and Transport is limited to roads along the proposed construction route including Long Lane, Bole Hill, Pleasley Road, Howarth Lane, the A631 West Bawtry Road and the A630 (non-strategic road network section). Beyond these roads, the construction traffic will be distributed onto the M1 which forms part of the strategic road network (SRN) dispersing further along numerous SRN routes and the effect of the additional traffic will be diluted. The proposed construction route is shown in Appendix D, Figure 3.9.1 – Traffic and Transport Proposed Construction Route of the EAR.

8.3 Surveys

Desk-Based Study

- 8.3.1 This Traffic and Transport assessment has been informed by a desk-based study which included a review of existing traffic baseline, transport policy/plans, potential future transport improvements and major development proposals. Discussions with National Grid were held, in particular around anticipated construction traffic movements and proposed mitigation measures. Initial engagement with Rotherham Metropolitan Brough Council (RMBC) was undertaken to agree the approach taken for this Traffic and Transport assessment, including the proposed construction route to/from the SRN and the Site.

Visual Inspection Survey

- 8.3.2 Site surveys were undertaken on Tuesday 16 April and Wednesday 17 April 2024 to allow for a visual inspection of the potential construction vehicle routes, confirming findings of background data and identifying any unknown constraints or opportunities. This included the proposed construction route along Long Lane, A631 West Bawtry

Road and the A360 connecting to the M1 Junction 33 (Catcliffe Roundabout) which forms part of the SRN, in addition to inspecting PRowS which could potentially be affected by the Scheme. A desktop review was undertaken in June 2026 to cover all proposed construction routes.

Traffic Surveys

- 8.3.3 Intelligent Data Collection (IDC) were commissioned to undertake traffic surveys for sections of the proposed construction route where DfT count data was not available, and on both approaches to the substation site access to obtain classified flows and 85% tile speed data over a one-week period.
- 8.3.4 Traffic surveys were undertaken for a one-week period, for 24 hours between 2 July and 8 July 2024 to avoid the school summer holidays. These data were collected via automatic traffic counts (ATC) on Long Lane and the A631.
- 8.3.5 The traffic surveys which have been undertaken are shown on a plan in Appendix D, Figure 3.9.1 – Traffic and Transport Proposed Construction Route.

8.4 Appraisal Approach

- 8.4.1 In order to identify the traffic and transport environmental impacts of the Scheme, a comparison of the current environmental conditions immediately before the Scheme is implemented (future baseline) was compared to a prediction of how the environmental conditions are likely to change during peak construction and during operation. An iterative process was followed during appraisal to develop appropriate control measures to avoid or reduce potential significant environmental impacts.

Assessment Methodology

- 8.4.2 This transport appraisal methodology is broadly based on assessment criteria developed for similar infrastructure projects and IEMA guidelines (IEMA, 2023) and using professional judgement.
- 8.4.3 The appraisal has been undertaken to understand the changes in traffic flows on road and links along the proposed construction route to and from the Scheme; to determine potential environmental effects associated with construction traffic generated by the Scheme, if any; and to ensure that proposed construction control measures identified in the EAR Chapter 3.9, Traffic and Transport are fit for purpose.
- 8.4.4 The IEMA guidelines (IEMA, 2023) suggest two broad rules that can be applied to the screening process to identify the appropriate extent of the assessment:
 - Rule 1: include roads where traffic flows are predicted to increase by more than 30% (or where the number of HGVs is predicted to increase by more than 30%); and
 - Rule 2: include any specifically sensitive areas where traffic flows are predicted to increase by 10% or more.
- 8.4.5 Where traffic increases are below the threshold, Traffic and Transport related environmental effects are considered unlikely to be significant.
- 8.4.6 This transport appraisal is concerned with potential effects relating to impacts during the construction period and considers potential Traffic and Transport effects on:

- Existing road users: drivers and passengers; pedestrians; cyclists; public transport users; operators and employees; commercial vehicle users; emergency vehicles users and freight users;
- Sensitive receptors: such as schools, playgrounds, hospitals, tourist attractions etc; and
- Transport infrastructure: road network, and pedestrian and cycle networks.

8.4.7 This appraisal has been informed by a desk-based study, and discussions with National Grid and its FEED contactor, in particular around anticipated construction traffic movements and proposed mitigation measures. Discussions have also been held with RMBC to consult on the proposed construction route for the substation works, existing traffic baseline, potential future transport improvements, major development proposals, and to incorporate their requirements.

8.4.8 The assessment considers conservative assumptions in order to ensure a robust appraisal of traffic and transport impacts. The assessment of construction traffic was undertaken for 2028 and 2029, as these are the years when the highest predicted levels of construction HGV traffic are expected to occur cumulatively with committed development traffic and exclusively with the Scheme construction traffic respectively. The assessment of the operational phase has been scoped out of the appraisal.

Sources of Baseline Data

8.4.9 The baseline data have been derived from multiple sources, and a desktop-review undertaken. Sources of baseline data are provided below:

- Annual Average Daily Traffic (AADT) flows have been obtained from Department for Transport (DfT) static traffic counters (DfT, 2025a). Location of the counters is shown on the plan in Appendix D, Figure 3.9.1 Traffic and Transport Proposed Construction Route of the EAR;
- AADT flows from the DfT counts were converted into average weekday traffic flows. 12-hour flows (07:00-19:00hrs) have been then derived from the DfT traffic data by applying an appropriate factor. This has been based on a standard daily profile over 24-hour period from the DfT's online road traffic statistics table TRA0307 (DfT, 2025b);
- Traffic Surveys have been undertaken by IDC using ATCs. Location of the counters is shown on the plan in Appendix D, Long Lane New Overhead Lines Drawings. From these surveys, the 12-hour flows (07:00-19:00 hrs) have been extracted;
- The latest three-year personal injury collision data from CrashMap (2021-2023) (Crashmap, 2025);
- Public Rights of Way (PRoWs) mapping from Rowmaps (Rowmaps, 2025);
- Information about public transport from Travel South Yorkshire (Travel South Yorkshire, 2025) and National Rail (National Rail, 2025); and
- Online mapping and aerial photograph from Google Maps (2025).

8.5 Limitations and Assumptions

8.5.1 The following limitations and assumptions have been identified for traffic and transport:

- Construction traffic forecasts are based on an initial high-level estimate of construction materials and programme and are considered to provide a reasonable worst-case scenario. It is considered that these limitations do not affect the robustness of the assessment;
- Traffic flows have been obtained from DfT's static traffic counters and traffic surveys to establish the future 2028 and 2029 baseline for the Traffic and Transport assessment;
- An assessment has been undertaken to identify the likely percentage increase in HGV and in total traffic due to construction on the Local Road Network using the future 2028 and future 2029 baseline traffic flow data. The predicted increase has been assessed against 12-hour weekday flows (07:00-19:00hrs);
- Traffic flow survey data was not available for Bole Hill and Flatts Lane. These roads will be used by overhead line construction vehicles, although these are expected to be minimal (47 daily construction traffic movements). Therefore, as a worst case assessment, the future baseline traffic movements from a nearby road has been used for Bole Hill. For Flatts Lane, this road serves a small cul-de-sac and is a private road beyond 200m of its junction with Bole Hill. And with no sensitive receptors, the level of traffic and transport impact on this road is expected to be not significant and therefore it is excluded from the appraisal process.
- As a worst case for the purpose of the appraisal, working days are assumed to be Monday to Friday, 07:00-19:00hrs, except during system outages. System outages are assumed to only be permitted within the clock change periods for standard summer working (end of March to end of October). During outages weekend working will be required. As such the assessment of predicted impacts from construction traffic against 12-hour weekday flows (07:00-19:00hrs) represent the worst-case scenario;
- It is anticipated that all construction HGV traffic would access the proposed construction routes from the SRN;
- It is assumed that the primary construction route will be between the SRN and the Scheme accesses travelling along the A630, A631 West Bawtry Road, Long Lane, Bole Hill, Flatts Lane, Howarth Lane and Pleasley Road; and
- During normal operation of the Scheme, it is understood that the only traffic generated would be associated with infrequent (assumption of 10 vehicles per year) repair and routine maintenance and inspection activities and a small number of operational staff. Operational traffic numbers will also be dependent on any operational issues with the Scheme. Therefore, movements are not anticipated to have a material effect on the transport network and receptors, and therefore, no further assessment will be required.

9. Agriculture and Soils Methodology

9.1 Legislation, Policy and Guidance

- 9.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Agriculture and Soils in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Policy

- 9.1.2 The Agricultural Land Classification (ALC) assessment is consistent with the direction given Chapter 19: Conserving and enhancing the natural environment, of the NPPF (MHCLG, 2026) as follows:

- N1: Identifying environmental opportunities and safeguards

“1. Development plans should safeguard and enhance the natural environment, and reflect the wider benefits from natural capital and ecosystem services, by using Local Nature Recovery Strategies, Protected Landscape Management Plans, River Basin Management Plans, National Forest Strategies, Community Forest Plans and other relevant evidence at the most appropriate level to: |

c. Steer the location of development, including through site allocations, in ways which utilise land of least environmental value where that would be consistent with other policies in this Framework. This should include limiting the scale and extent of development within Protected Landscapes, avoiding the use of higher quality agricultural land where land of poorer quality is available and avoiding and minimising harm to designated sites of importance for nature. Areas which could become of particular importance for nature identified in Local Nature Recovery Strategies should be taken into account as opportunities to integrate development with environmental restoration, but should not necessarily preclude the allocation of land for development;”

- N2: Improving the natural environment

“1. To contribute positively to the natural environment, and support nature’s recovery, development proposals should: |

b. Take into account the quality of agricultural land (including that classified as best and most versatile agricultural land, and its grade), and if significant development of agricultural land is necessary, use areas of poorer quality land where possible.”

- 9.1.3 The National Policy Statement (NPS) for Energy (EN-1) (Department for Energy Security and Net Zero, 2023) states that energy projects could have adverse effects on agriculture, as follows:

- Paragraph 5.11.12 states that Applicants should ‘seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5)’; and

- Paragraph 5.11.34 states the Secretary of State should *‘ensure that applicants do not site their scheme on the best and most versatile agricultural land without justification. Where schemes are to be sited on best and most versatile agricultural land the Secretary of State should take into account the economic and other benefits of that land. Where development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.’*

- 9.1.4 The Rotherham Local Plan Core Strategy 2013-2028 (adopted September 2014) states in Policy CS 3 Location of New Development that *‘in allocating a site for development the Council will have regard to relevant sustainability criteria, including its... i) ability to limit the loss of best and most versatile agricultural land (Grades 1, 2, and 3a)...’*
- 9.1.5 Policy CS 20 Biodiversity and Geodiversity also states that priority will be given to *‘protecting soil resources and managing the release of the best and most versatile agricultural land, taking into account it’s economic and other benefits and releasing only areas of poorer quality in preference to that of a higher quality.’*

Guidance

- 9.1.6 The ALC system for England and Wales (Welsh Government and Defra, 2025) for grading land quality for land use planning divides agricultural land into five grades (with Grade 3 land subdivided into Grades 3a and 3b). These grades divide land according to the degree of limitation imposed on land use by the inherent characteristics of climate, site, and soils.
- 9.1.7 Protecting BMV agricultural land and the undertaking of ALC is supported by the Natural England Guide to assessing development proposals on agricultural land (Natural England, 2021).
- 9.1.8 A description of each grade is set out below based on the ALC guidelines.

Grade 1 – excellent quality agricultural land

Land with no or very minor limitations to agricultural use. A very wide range of agricultural and horticultural crops can be grown and commonly includes top fruit, soft fruit, salad crops and winter harvested vegetables. Yields are high and less variable than on land of lower quality.

Grade 2 – very good quality agricultural land

Land with minor limitations which affect crop yield, cultivations or harvesting. A wide range of agricultural and horticultural crops can usually be grown but on some land in the grade there may be reduced flexibility due to difficulties with the production of the more demanding crops such as winter harvested vegetables and arable root crops. The level of yield is generally high but may be lower or more variable than Grade 1.

Grade 3 – good to moderate quality agricultural land

Land with moderate limitations which affect the choice of crops, timing and type of cultivation, harvesting or the level of yield. Where more demanding crops are grown the yields are generally lower or more variable than on land in Grades 1 and 2.

Subgrade 3a – good quality agricultural land

Land capable of consistently producing moderate to high yields of a narrow range of arable crops, especially cereals, or moderate yields of a wide range of crops including cereals, grass, oilseed rape, potatoes, sugar beet and the less demanding horticultural crops.

Subgrade 3b – moderate quality agricultural land

Land capable of producing moderate yields of a narrow range of crops, principally cereals and grass or lower yields of a wider range of crops or high yields of grass which can be grazed or harvested over most of the year.

Grade 4 – poor quality agricultural land

Land with severe limitations which significantly restrict the range of crops and/or level of yields. It is mainly suited to grass with occasional arable crops (e.g. cereals and forage crops) the yields of which are variable. In moist climates, yields of grass may be moderate to high, but there may be difficulties in utilisation. The grade also includes very droughty arable land.

Grade 5 – very poor-quality agricultural land

Land with very severe limitations which restrict use to permanent pasture or rough grazing, except for occasional pioneer forage crops.

9.2 Surveys and Appraisal

- 9.2.1 A desk study, to collate baseline information for the Scheme, such as geology, available ALC and soil information, was undertaken. The assessment presented in the EAR for Agriculture and Soils is based on desk-based information, including the Predictive Agricultural Land Classification Map for England (Defra, 2026).
- 9.2.2 An ALC survey will be undertaken pre-construction and the data obtained will inform a Soil Management Plan (SMP) and where practicable, data will be incorporated into the EAR report, where any updates will be made accordingly.
- 9.2.3 The ALC survey and assessment will be undertaken in accordance with:
 - Soil Survey Field Handbook (Hodgson, 2022);
 - ALC guidelines (Welsh Government and Defa, 2025); and
 - Meteorological Office climatological data (Meteorological Office, 1989).
- 9.2.4 A detailed survey will be undertaken involving the examination of the physical soil properties.
- 9.2.5 The survey will be conducted at a density of one auger bore examination per hectare within the Scheme boundary, meeting the Guidance requirement. Auger bores will be set out prior to the field survey and will be loaded with Google Earth app into smart phones to locate auger bore locations in the field along with paper map.
- 9.2.6 The following soil and site properties will be examined/recorded:
 - soil texture;

- horizon depths;
- stoniness;
- calcareousness (using 10% hydrochloric acid);
- matrix colour (based on a Munsell Colour Chart (Munsell, 2022));
- mottles (colour, size and number);
- ped structure; and
- slope (using a clinometer).

9.2.7 A Cable Avoidance Tool and Signal Generator will be used to scan each auger bore and the soil pit to avoid buried services before breaking ground. Soils from each auger bore will be reinstated after examination.

9.2.8 A soil pit will be dug (following a check for buried services) in a representative soil type and further profile descriptions made to confirm the properties recorded from the auger bores.

9.3 Limitations

9.3.1 The following limitations and assumptions have been identified for agriculture and soils:

9.3.2 A detailed ALC survey has not been conducted prior to the assessment, and the assessment has been based on desk-based Predictive ALC mapping. A detailed ALC survey will be undertaken pre-construction to inform a SMP.

10. Socioeconomics and Human Health Methodology

10.1 Legislation, Policy and Guidance

- 10.1.1 This appraisal has been undertaken in accordance with current national legislation, and national, regional and local plans and policies relating to Socioeconomics and Human Health in the context of the Scheme. A summary of the relevant legislation, policies and guidance, the requirements of these policies and the Scheme response is provided below.

Legislation

- 10.1.2 This section provides a summary of legislation which is specific to the Socioeconomics and Human Health assessment:

- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (as amended in 2020) Schedule 4, Section 4 sets out the requirement to include a description of the factors that are likely to be potentially affected by the development, including population and human health; and
- Countryside and Rights of Way Act 2000 (as amended in 2015) outlines the principal legislation governing the registration and protection of public footpaths, bridleways, byways open to all traffic and restricted byways.

Policy

- 10.1.3 This section provides a summary of policy which is specific to the Socioeconomics and Human Health assessment:

- The NPPF (MHCLG, 2026) sets out the Government's economic, social and environmental planning policies for England. These policies outline the Government's vision of sustainable development. Chapter 7: Building a Strong, Effective Economy promote sustainable economic growth and investment. The NPPF recognises the important role of infrastructure in supporting the transition to a low-carbon economy, enhancing energy security and delivering environmental, social and economic benefits. Development proposals should therefore contribute towards these objectives whilst ensuring that adverse effects are appropriately avoided, reduced or mitigated;
- Planning Practice Guidance (PPG) (MHCLG, 2024b) offers guidance on a range of issues, including *'healthy and safe communities'*, and *'open space, sports and recreation facilities, public rights of way and local green space'*; and
- The Rotherham Local Plan (RMBC, 2018) sets out the vision for Rotherham between 2018 and 2028. This includes protection green space (SP 38), safeguarding community facilities (SP 62) and access to community facilities (SP 64).

Guidance

- 10.1.4 This section provides a summary of guidance for the Socioeconomics and Human Health assessment.
- 10.1.5 There is no specific guidance available on approaches in assessing the impacts of a substation on Socioeconomics. The methodology used has been based on experience from similar projects and professional judgement.
- 10.1.6 The assessment of community facilities, business, recreation and tourism assets is guided by DMRB LA 112 Population and Human Health (Highways England, 2020).
- 10.1.7 The assessment of human health is guided by the following:
- Health in Environmental Impact Assessment - A Primer for a Proportionate Approach (IEMA, 2017);
 - Effective Scoping of Human Health in Environmental Impact Assessment (IEMA, 2022a);
 - Determining Significance for Human Health in Environmental Impact Assessment (IEMA, 2022b);
 - Mental Well-being Impact Assessment (MWIA) toolkit (NMWIAC, 2011); and
 - International Commission on non-ionizing radiation protection (ICNIRP) Guidelines for Limiting Exposure to Electromagnetic Fields (ICNIRP, 2020).

10.2 Study Area

- 10.2.1 The study area for Socioeconomics and Human Health comprises:
- Socioeconomics: This assessment is based on the local planning authority the Scheme falls within, Rotherham metropolitan borough. For comparative purposes, Yorkshire and The Humber have also been identified;
 - Community facilities: This assessment is based on a 500m buffer from the Scheme boundary;
 - Business, recreation and tourism assets: This assessment is based on a 500m buffer from the Scheme boundary; and
 - Human health: This assessment is based on the local planning authority the Scheme falls within, Rotherham metropolitan borough.

10.3 Surveys

- 10.3.1 No surveys were required in support of the Socioeconomics and Human Health appraisal.

10.4 Appraisal Approach

- 10.4.1 In order to identify the environmental impacts of the Scheme, a comparison of the current environmental conditions immediately before the Scheme is implemented (baseline) was compared to a prediction of how the environmental conditions are likely to change once the construction and operation of the Scheme has been undertaken. An iterative process was followed during appraisal to develop appropriate control measures to avoid or reduce potential environmental impacts.

- 10.4.2 The Socioeconomics and Human Health assessment has been undertaken based on a desk-based review of publicly available information from the following sources:
- Nomis (Nomis, 2025);
 - English Indices of Deprivation (MHCLG, 2019);
 - Department of Health and Social Care (DHSC, 2025); and
 - Ordnance Survey (OS) Mapping.
- 10.4.3 The appraisal undertakes a qualitative assessment and identifies the likely impacts on Socioeconomics and Human Health receptors, including:
- Socioeconomics:
 - A temporary and/or permanent change in the local economy from the direct creation or loss of jobs.
 - Community facilities, business, recreation and tourism assets:
 - A temporary and/or permanent change in land use and access to community facilities, business, recreation and tourism assets.
 - A temporary and/or permanent change to recreational routes, including PRowS and cycle routes.
 - Human health:
 - A temporary and/or permanent change in environmental conditions, including air quality, noise, visual amenity and presence of HGV traffic, which may affect human health.
- 10.4.4 The assessment of impact has been assigned based on Table 10.1.

Table 10.1 Assessment matrix

Impact	Description
High	<p>Socioeconomics:</p> <ul style="list-style-type: none"> • number of employment opportunities is large in scale when compared to the combined local planning authorities' total number of employees within the sector (for example the construction employment opportunities to be generated by the proposal will represent the majority of the combined local planning authorities' total number of employees in the construction sector). <p>Community facility:</p> <ul style="list-style-type: none"> • loss of resource and/or quality and integrity of resource; or • severe damage to key characteristics, features or elements (for example direct acquisition and demolition of facility); or • introduction (adverse) or removal (beneficial) of complete severance with no/full accessibility provision. <p>Business, recreational and tourism asset:</p> <ul style="list-style-type: none"> • where the extent of impacts on receptors is large in scale (for example loss of recreational or tourism asset; or leads directly to closure); or • where the recreational route will be fully stopped up with no access provision. <p>Human health:</p>

Impact	Description
	<ul style="list-style-type: none"> high exposure or scale; long-term duration; continuous frequency; severity predominantly related to mortality or changes in morbidity (physical or mental health) for very severe illness/injury outcomes; majority of population affected; permanent change; substantial service quality implications.
Medium	<p>Socioeconomics:</p> <ul style="list-style-type: none"> number of employment opportunities is moderate in scale when compared to the combined local planning authorities' total number of employees within the sector (for example the construction employment opportunities to be generated by the proposal will represent half of the combined local planning authorities' total number of employees in the construction sector). <p>Community facility:</p> <ul style="list-style-type: none"> potential loss of/damage to key characteristics, features or elements (for example partial removal or substantial amendment to access or acquisition of facility); or introduction (adverse) or removal (beneficial) of severance with limited/moderate accessibility provision. <p>Business, recreational and tourism asset:</p> <ul style="list-style-type: none"> where the extent of impacts on receptors may be moderate (for example substantial amendment or partial closure to recreational or tourism asset); or where access to the recreational route will be fully affected with diversion in place. <p>Human Health:</p> <ul style="list-style-type: none"> low exposure or medium scale; medium-term duration; frequent events; severity predominantly related to moderate changes in morbidity or major change in quality of life; large minority of population affected; gradual reversal; small service quality implications.
Low	<p>Socioeconomics:</p> <ul style="list-style-type: none"> number of employment opportunities is small in scale when compared to the combined local planning authorities' total number of employees within the sector (for example the construction employment opportunities to be generated by the proposal will represent less than half of the combined local planning authorities' total number of employees in the construction sector). <p>Community facility:</p> <ul style="list-style-type: none"> a discernible change in attributes, quality or vulnerability; or minor loss of, or alteration to one (maybe more) key characteristics, features or elements (for example amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of the community facility; or introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision. <p>Business, recreational and tourism asset:</p> <ul style="list-style-type: none"> where the extent of impacts on receptors is considered to be small (for example minor amendment to recreational or tourism asset that does not compromise overall accessibility of recreational route; or minor reduction in annual visitor numbers but this is considered to be within the parameters of normal annual variability); or

Impact	Description
	<ul style="list-style-type: none"> where access to the recreational route will be partially affected with diversion in place. <p>Human health:</p> <ul style="list-style-type: none"> very low exposure or small scale; short-term duration; occasional events; severity predominantly related to minor change in morbidity or moderate change in quality of life; small minority of population affected; rapid reversal; slight service quality implications.
Negligible	<p>Socioeconomics:</p> <ul style="list-style-type: none"> number of employment opportunities is very small in scale when compared to the combined local planning authorities' total number of employees within the sector (for example the construction employment opportunities to be generated by the proposal will represent an insignificant number of the combined local planning authorities' total number of employees in the construction sector). <p>Community facility:</p> <ul style="list-style-type: none"> very minor loss or alteration to one or more characteristics, features or elements (for example acquisition of non-operational land or buildings not directly affecting the viability of the community facility; or very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision. <p>Business, recreational and tourism asset:</p> <ul style="list-style-type: none"> where there is no credible scenario whereby the proposal could affect the operation of recreational or tourism asset, visitor numbers, tourism opportunities or benefits beyond a handful of individuals; or where there is no credible change of access to the recreational route. <p>Human health:</p> <ul style="list-style-type: none"> negligible exposure or scale; very short-term duration; one-off frequency; severity predominantly relates to a minor change in quality of life; very few people affected; immediate reversal once activity complete; no service quality implication.

10.5 Limitations and Assumptions

- 10.5.1 The following limitations and assumptions have been identified for socioeconomics and human health.
- The assessment relies on, in part, data provided by third parties (e.g. OS Mapping, Local Authorities, ONS), which are the most up-to-date, available at the time of the assessment. No significant changes or limitations in these datasets have been identified that would affect the robustness of the assessment.
- 10.5.2 No site survey has been undertaken for the purpose of this Chapter. However, this is not considered to affect the robustness of the assessment due to baseline information being publicly available online.

11. Cumulative Impacts Methodology

11.1 Legislation, Policy and Guidance

- 11.1.1 As set out in the EIA screening report, the Scheme is not considered to be an EIA development by the nature of the proposals, in combination with the receiving environment. The EAR gives consideration to the potential for cumulative impacts. Therefore, for the purposes of the EAR, the following text from the EIA Regulations has guided the approach to the appraisal:

‘a description of the likely significant effects of the development on the environment, which should cover the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the development’.

11.2 Study Area

- 11.2.1 For the appraisal of intra-project cumulative impacts, the study area was defined by taking into account the study areas set out for each environmental discipline. As such, the study area was reflective of the largest study area of the disciplines and set to 2km.

11.3 Surveys

- 11.3.1 Due to the nature of the appraisal, no surveys were conducted.

11.4 Appraisal Approach

Intra-project cumulative impacts

- 11.4.1 The appraisal of intra-project cumulative impacts was carried out using the below stages.

Stage 1 – Screening

- 11.4.2 This stage identifies whether a sensitive receptor experiences more than one type of residual impact. Sensitive receptors or receptor groups were identified based on the environmental appraisal and professional judgement.
- 11.4.3 Table 3.12.1 of the EAR summarises the sensitive receptors for each environmental discipline and whether they experience more than one residual impact. Impacts were defined as ‘minor or negligible impact’ or ‘moderate or above impact’ depending on their appraisal within the relevant environmental disciplines.

Stage 2 – Intra-project cumulative impacts

- 11.4.4 The appraisal concluded whether an intra-project cumulative impact was or was not identified for each committed development.

Inter-project cumulative impacts

Stage 1 – Long and short list of committed developments

- 11.4.5 A list of committed developments was produced, using a 2km study area. This list contained planning applications within the previous five years. Planning applications of a notably small-scale, for example changes to one building, were excluded from this list based on professional judgement of the scope of impact of the planning application being unlikely to generate a cumulative impact.
- 11.4.6 The list has been prepared using professional judgement, guided by the below criteria:
- A 2km study area;
 - Residential developments of over 10 dwellings;
 - Nationally Significant Infrastructure Projects;
 - Projects that are EIA;
 - Projects that were deemed, using professional judgement, to be of a nature or scale that had the potential to generate environmental impacts; and
 - Have submitted a planning application in the last 5 years and that this application is still valid (for example, it has not been refused).

Stage 2 – Information Gathering

- 11.4.7 Publicly available information was used to carry out the appraisal of inter-project cumulative impacts. Where sufficient information was not publicly available, it was not possible to determine the potential for cumulative impacts with the committed developments.
- 11.4.8 The timing of works, the proximity of the committed development, and the associated impacts of the committed developments was taken into consideration where possible in determining the potential for inter-project cumulative impacts.

Stage 3 – Inter-project cumulative impacts

- 11.4.9 Table 3.12.3 of the EAR presents the appraisal of inter-project cumulative impacts.
- 11.4.10 The appraisal is based on the residual impacts identified in the environmental discipline chapters of the EAR as well as the publicly available information on the committed developments. The appraisal was carried out using professional judgement and environmental information relating to the committed developments available at the time of appraisal.
- 11.4.11 The following topics were scoped out of further appraisal of inter-project cumulative impacts because they were identified as having no impacts during construction or operation:
- ecology;
 - air quality; and
 - noise and vibration.

- 11.4.12 Agriculture and soils were scoped into the inter-project assessment for the construction phase. Agriculture and soils were scoped out of further assessment for the operational phase as there are no operational impacts.
- 11.4.13 The appraisal concluded whether an inter-project cumulative impact was or was not identified for each committed development.

11.5 Limitations and Assumptions

- 11.5.1 The appraisal of inter-project cumulative impacts arising from committed developments was limited to the level of publicly available information on the environmental impacts of those developments.
- 11.5.2 For the purpose of the appraisal of inter-project cumulative impacts, where the programme of the committed development was not known, a 'worst-case' approach was taken that assumed construction and operation of the committed development would overlap with the Scheme.

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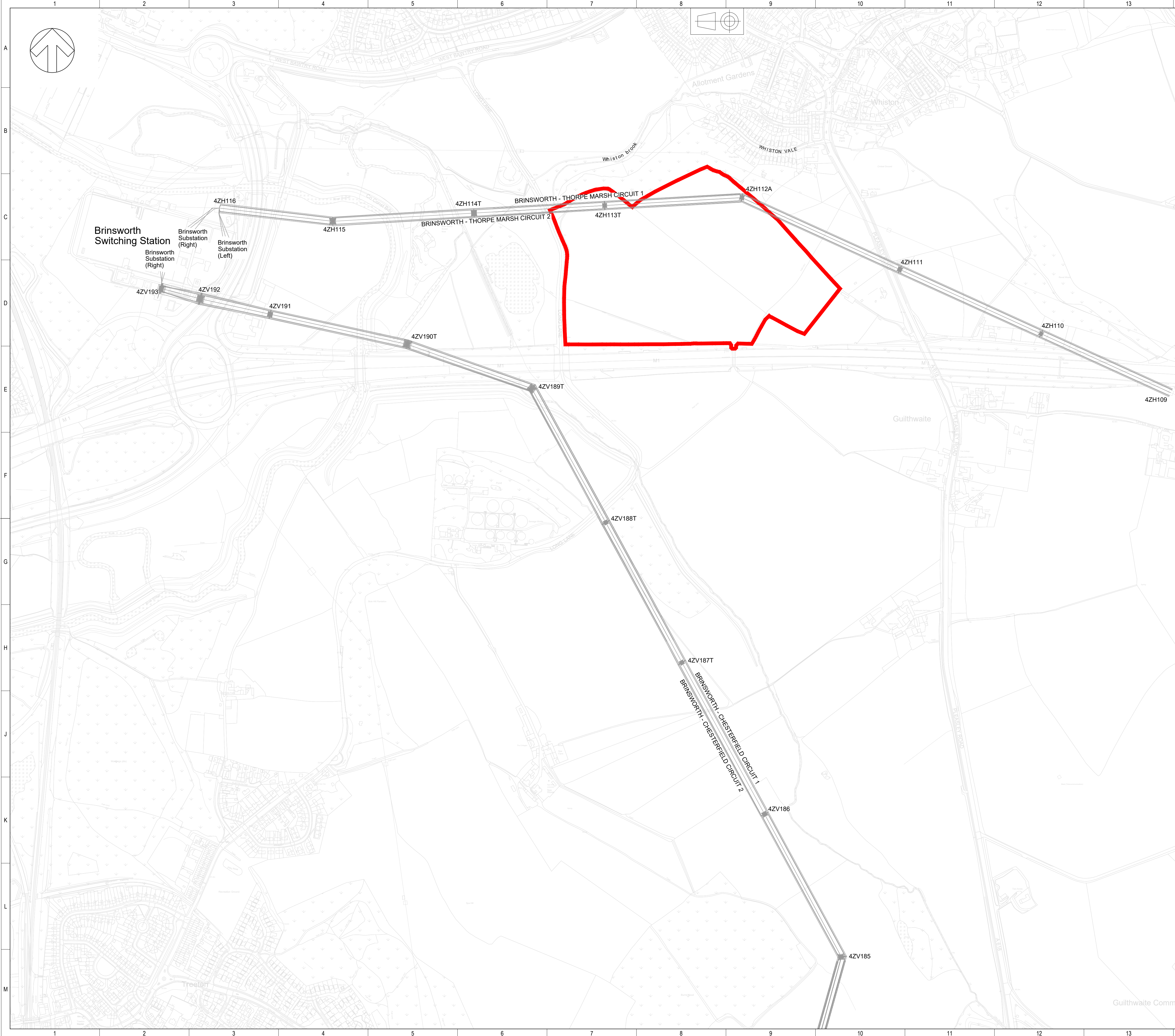
National Grid plc
National Grid House,
Warwick Technology Park,
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Appendix C

Long Lane Overhead

Works Plans



NOTES

PHASE 01:
EXISTING OVERHEAD LINE ARRANGEMENT AT BRINSWORTH SUBSTATION.

LEGEND

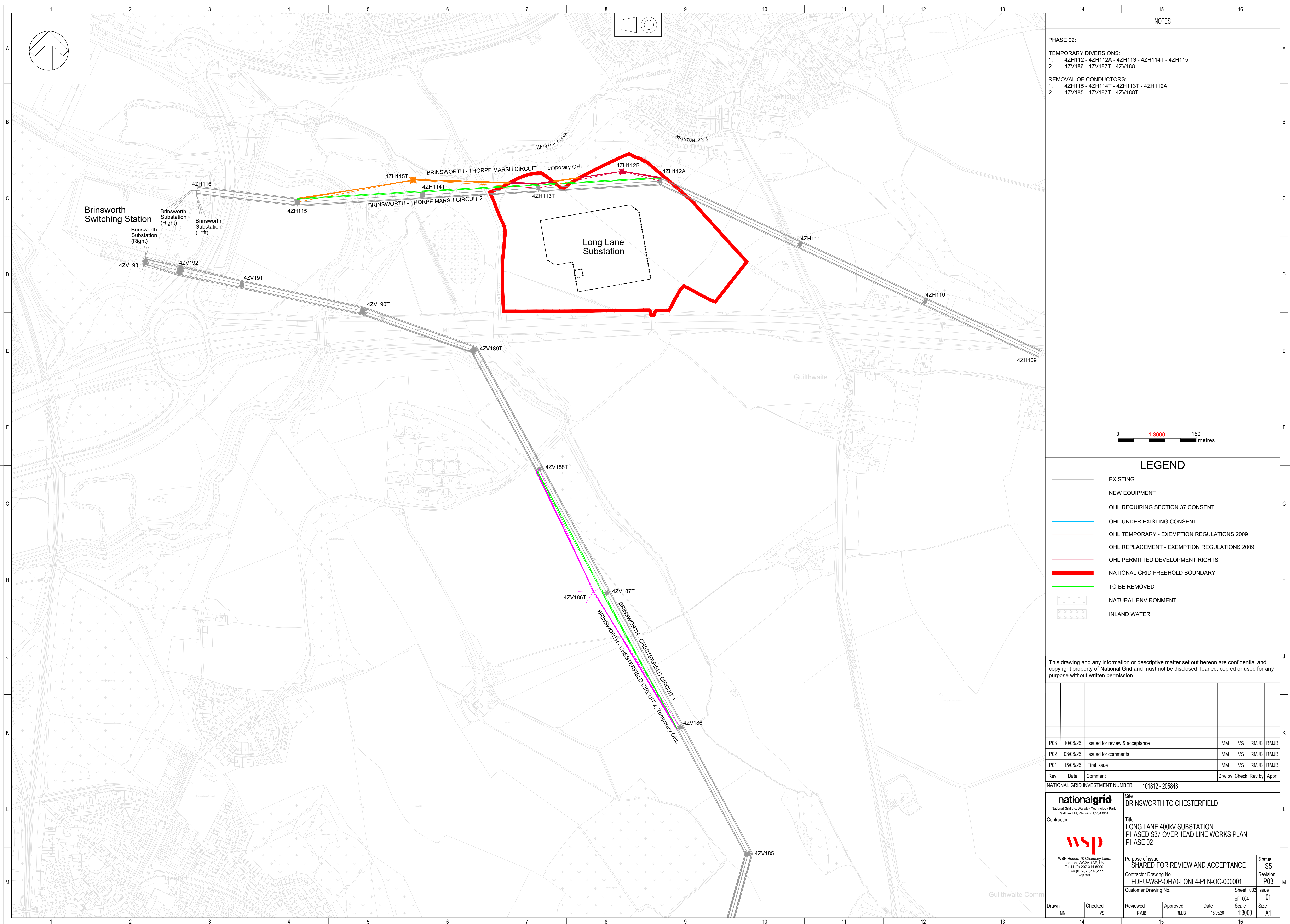
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- NEW EQUIPMENT
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- OHL UNDER EXISTING CONSENT
- OHL TEMPORARY - EXEMPTION REGULATIONS 2009
- OHL REPLACEMENT - EXEMPTION REGULATIONS 2009
- OHL PERMITTED DEVELOPMENT RIGHTS
- NATIONAL GRID FREEHOLD BOUNDARY
- TO BE REMOVED
- NATURAL ENVIRONMENT
- INLAND WATER

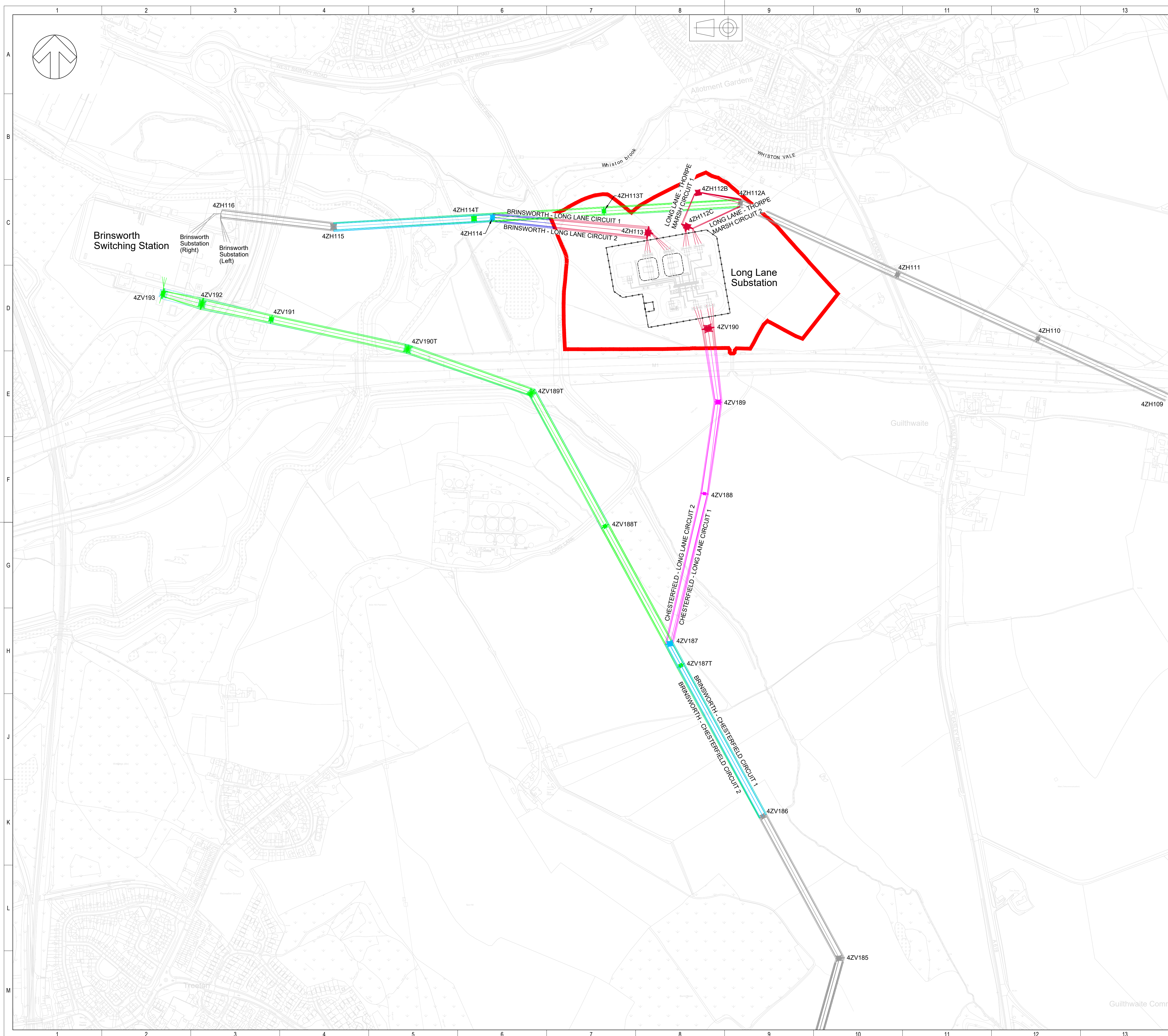
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P03	10/06/26	Issued for review & acceptance	MM	VS	RMJB	RMJB
P02	03/06/26	Issued for comments	MM	VS	RMJB	RMJB
P01	15/05/26	First issue	MM	VS	RMJB	RMJB
Rev.	Date	Comment	Drw by	Check	Rev by	Appr.

NATIONAL GRID INVESTMENT NUMBER: 101812 - 205848

 National Grid plc, Warwick Technology Park, Gatfords Hill, Warwick, CV34 6DA.	Site BRINSWORTH TO CHESTERFIELD				
	Contractor WSP House, 70 Chancery Lane, London, WC2A 1AF, UK T+ 44 (0) 207 314 5500, F+ 44 (0) 207 314 5111 wsp.com				
	Title LONG LANE 400KV SUBSTATION PHASED S37 OVERHEAD LINE WORKS PLAN PHASE 01				Status S5
	Purpose of issue SHARED FOR REVIEW AND ACCEPTANCE				Revision P03
Contractor Drawing No. EDEU-WSP-OH70-LONL4-PLN-OC-000001				Sheet of 004	Issue 01
Customer Drawing No.				Date 15/05/26	Scale 1:3000
Drawn MM	Checked VS	Reviewed RMJB	Approved RMJB	Date 15/05/26	Size A1





NOTES

PHASE 03:

COMBINATION OF EQUIPMENT TO BE REMOVED AND FINAL PHASE



LEGEND

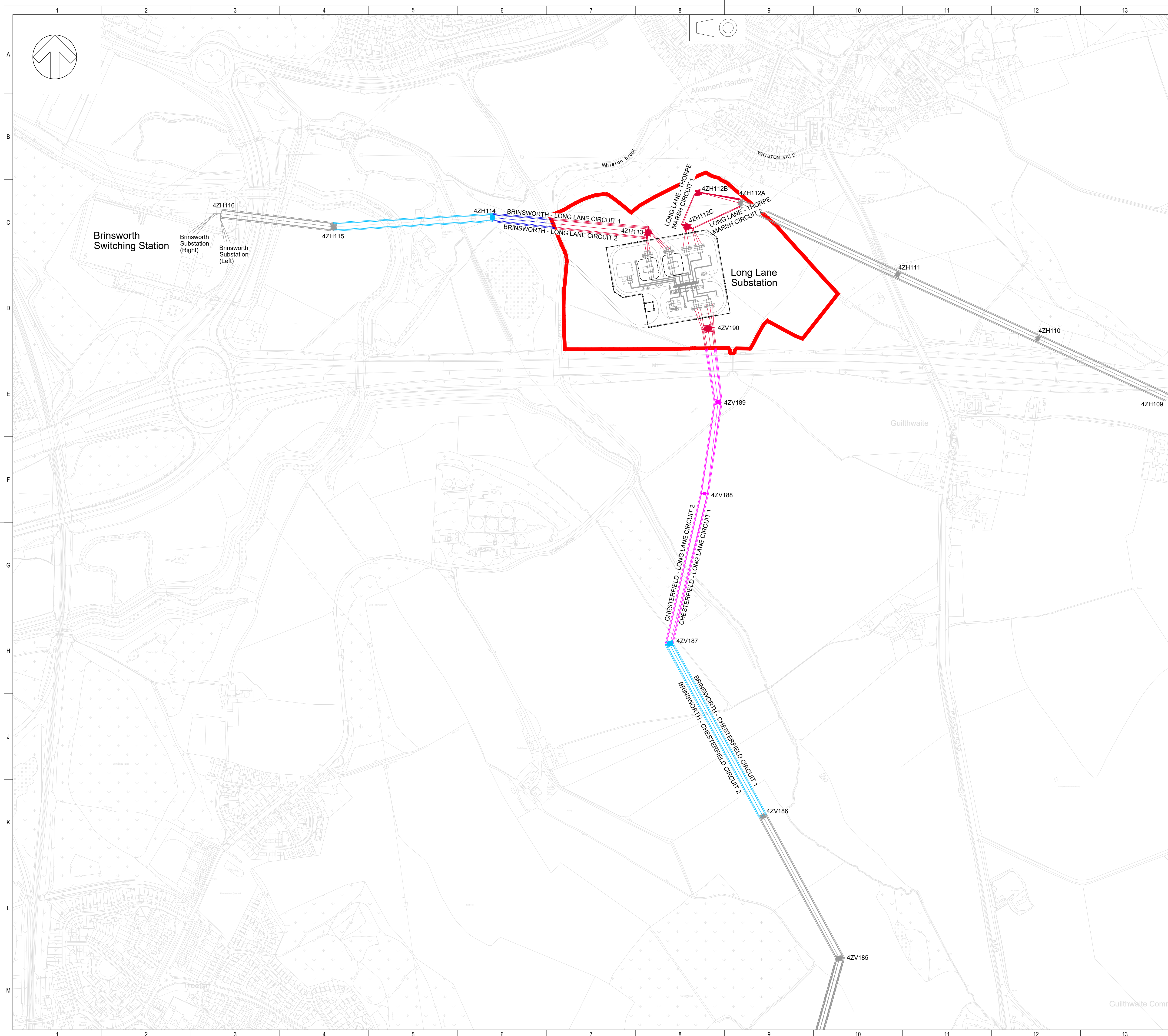
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|  | OHL UNDER EXISTING CONSENT |
|  | OHL TEMPORARY - EXEMPTION REGULATIONS 2009 |
|  | OHL REPLACEMENT - EXEMPTION REGULATIONS 2009 |
|  | OHL PERMITTED DEVELOPMENT RIGHTS |
|  | NATIONAL GRID FREEHOLD BOUNDARY |
|  | TO BE REMOVED |
|  | NATURAL ENVIRONMENT |
|  | INLAND WATER |

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P03	10/06/26	Issued for review & acceptance	MM	VS	RMJB	RMJB	
P02	03/06/26	Issued for comments	MM	VS	RMJB	RMJB	
P01	15/05/26	First issue	MM	VS	RMJB	RMJB	
Rev.	Date	Comment	Drw by	Check	Rev by	Appr.	K

NATIONAL GRID INVESTMENT NUMBER:	101812 - 205848
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 <p>National Grid plc, Warwick Technology Park, Galloway Hill, Warwick, CV34 6DA</p>		<p>Site BRINSWORTH TO CHEREFIELD</p>	
<p>Contractor</p> <div style="text-align: center;">  </div> <p>WSP House, 70 Chancery Lane, London, WC2A 1AF, UK T: +44 (0) 207 314 6000 F: +44 (0) 207 314 5111 wsp.com</p>		<p>Title LONG LANE 400KV SUBSTATION PHASED S37 OVERHEAD LINE WORKS PLAN PHASE 03</p>	
		<p>Purpose of issue SHARED FOR REVIEW AND ACCEPTANCE</p>	<p>Status S5</p>
		<p>Contractor Drawing No. EDEU-WSP-OH70-LONL4-PLN-OC-000001</p>	<p>Revision P03</p>
		<p>Customer Drawing No.</p>	<p>Sheet 003 of 004 Issue 01</p>
<p>Drawn MM</p>	<p>Checked VS</p>	<p>Reviewed RMB</p>	<p>Approved RMB</p>
		<p>Date 15/05/26</p>	<p>Scale 1:3000 Size A1</p>



NOTES

PHASE 04:
FINAL PHASE



LEGEND

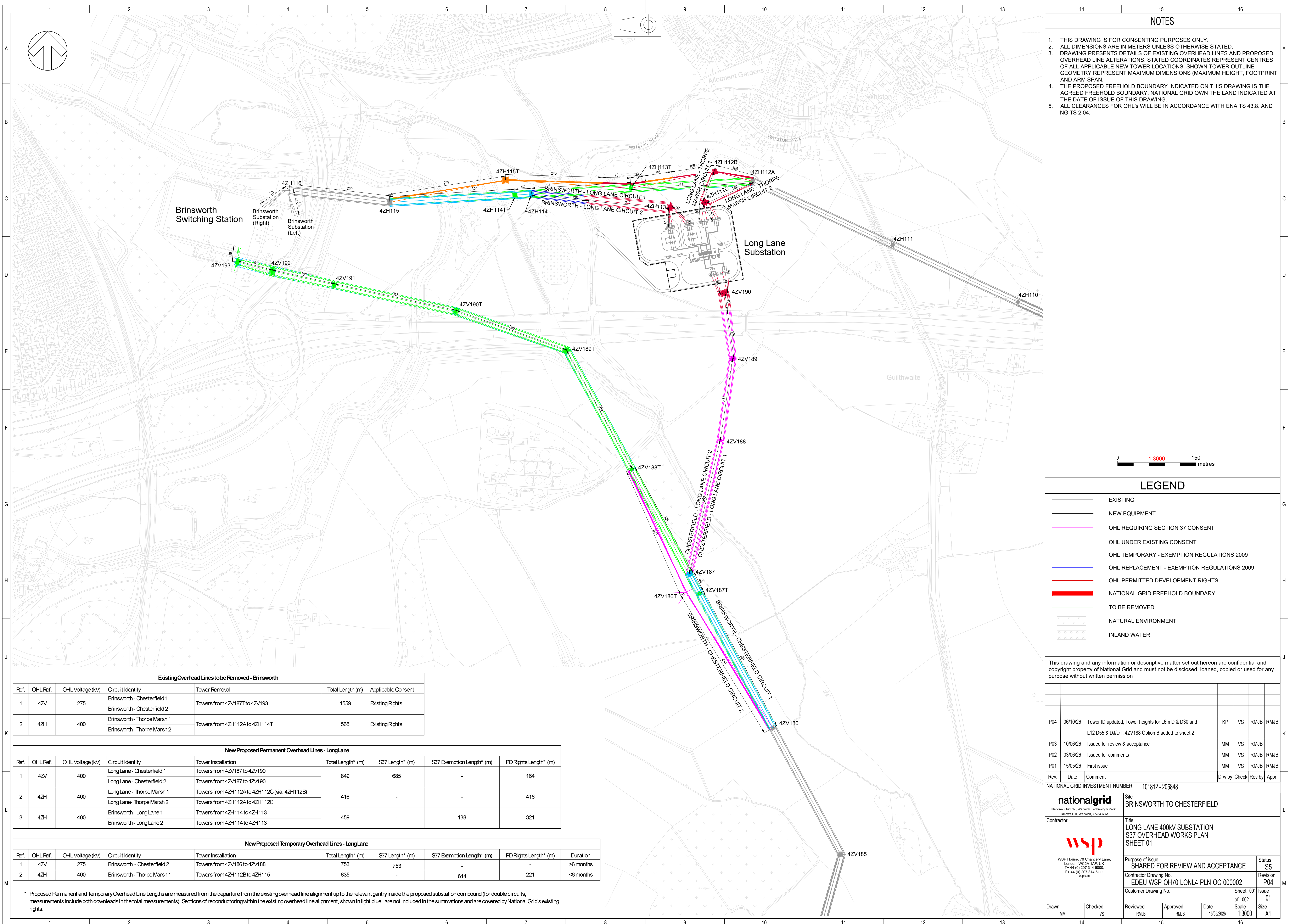
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|  | OHL TEMPORARY - EXEMPTION REGULATIONS 2009 |
|  | OHL REPLACEMENT - EXEMPTION REGULATIONS 2009 |
|  | OHL PERMITTED DEVELOPMENT RIGHTS |
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|  | TO BE REMOVED |
|  | NATURAL ENVIRONMENT |
|  | INLAND WATER |

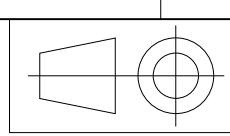
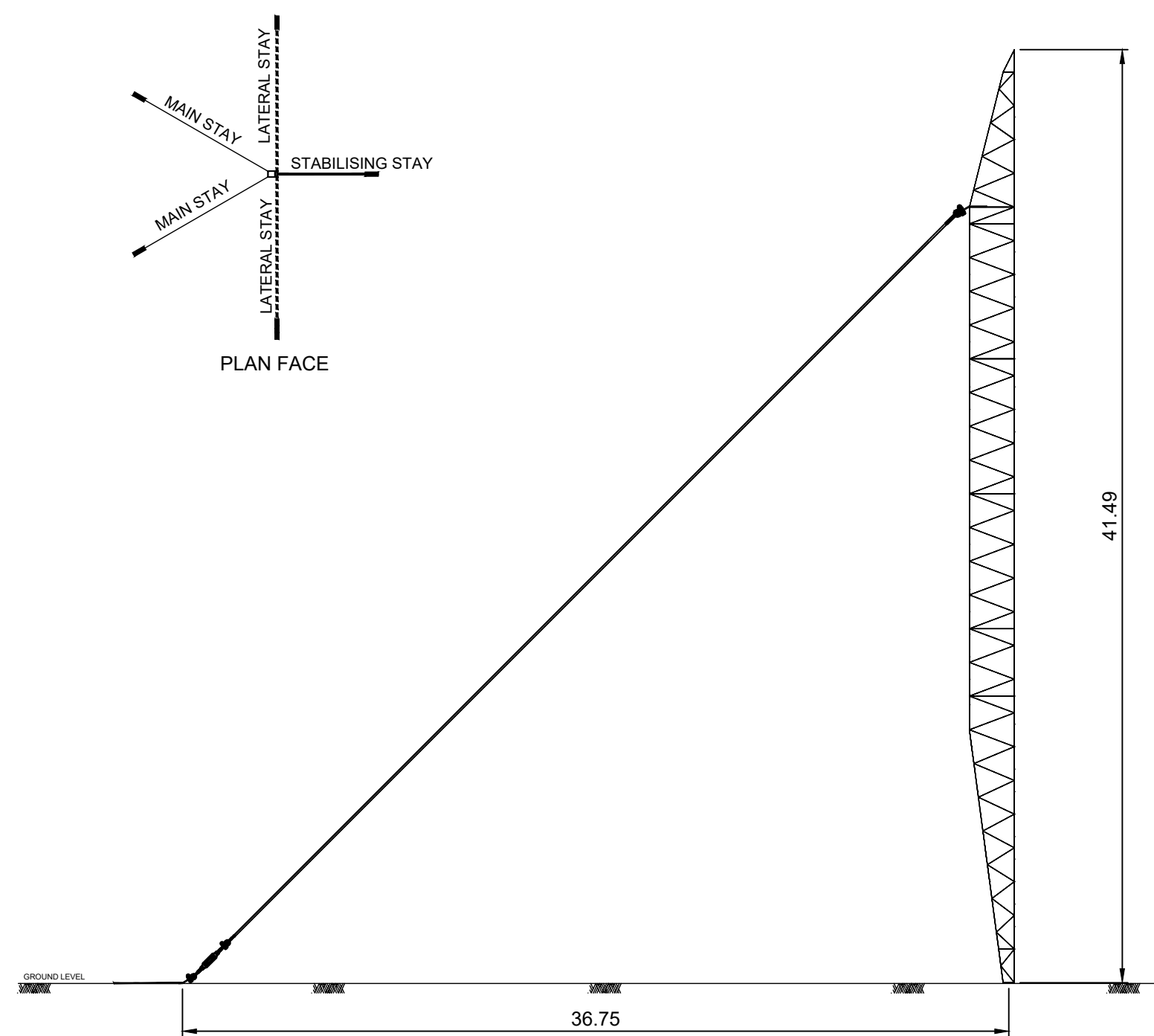
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P03	10/06/26	Issued for review & acceptance		MM	VS	RMJB	RMJB
P02	03/06/26	Issued for comments		MM	VS	RMJB	RMJB
P01	15/05/26	First issue		MM	VS	RMJB	RMJB
Rev.	Date	Comment		Drw by	Check	Rev by	Appr.

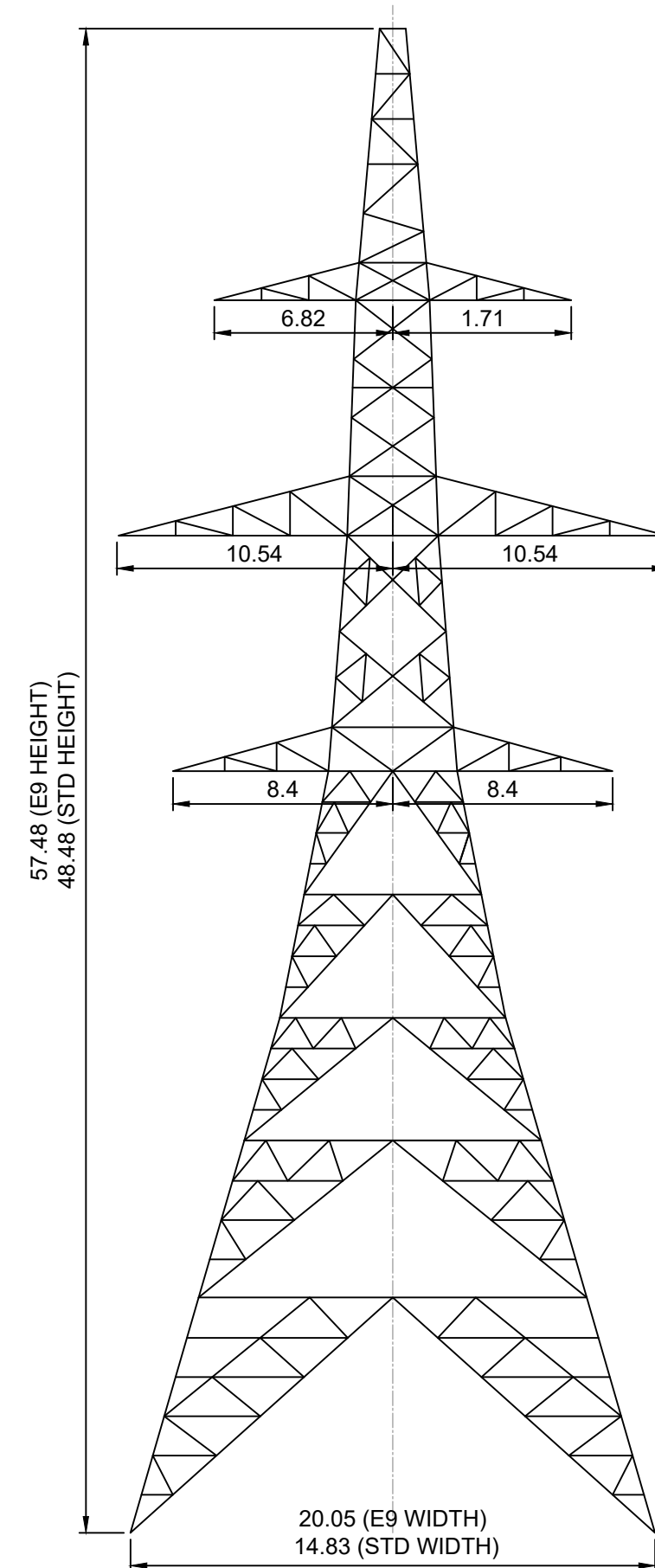
NATIONAL GRID INVESTMENT NUMBER:	101812 - 205848
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 <p>National Grid plc, Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA</p>		<p>Site BRINSWORTH TO CHERTERFIELD</p>			
<p>Contractor</p>  <p>WSP House, 70 Chancery Lane, London, WC2A 1AF, UK T+44 (0) 207 314 5000 F+44 (0) 207 314 5111 wsp.com</p>		<p>Title LONG LANE 400KV SUBSTATION PHASED S37 OVERHEAD LINE WORKS PLAN PHASE 03</p>			<p>Status S5</p>
		<p>Purpose of issue SHARED FOR REVIEW AND ACCEPTANCE</p>			<p>Revision P03</p>
		<p>Contractor Drawing No. EDEU-WSP-OH70-LONL4-PLN-OC-000001</p>		<p>Customer Drawing No.</p>	<p>Sheet 004 of 004</p>
<p>Drawn MM</p>	<p>Checked VS</p>	<p>Reviewed RMBJ</p>	<p>Approved RMBJ</p>	<p>Date 15/05/26</p>	<p>Scale 1:3000</p>
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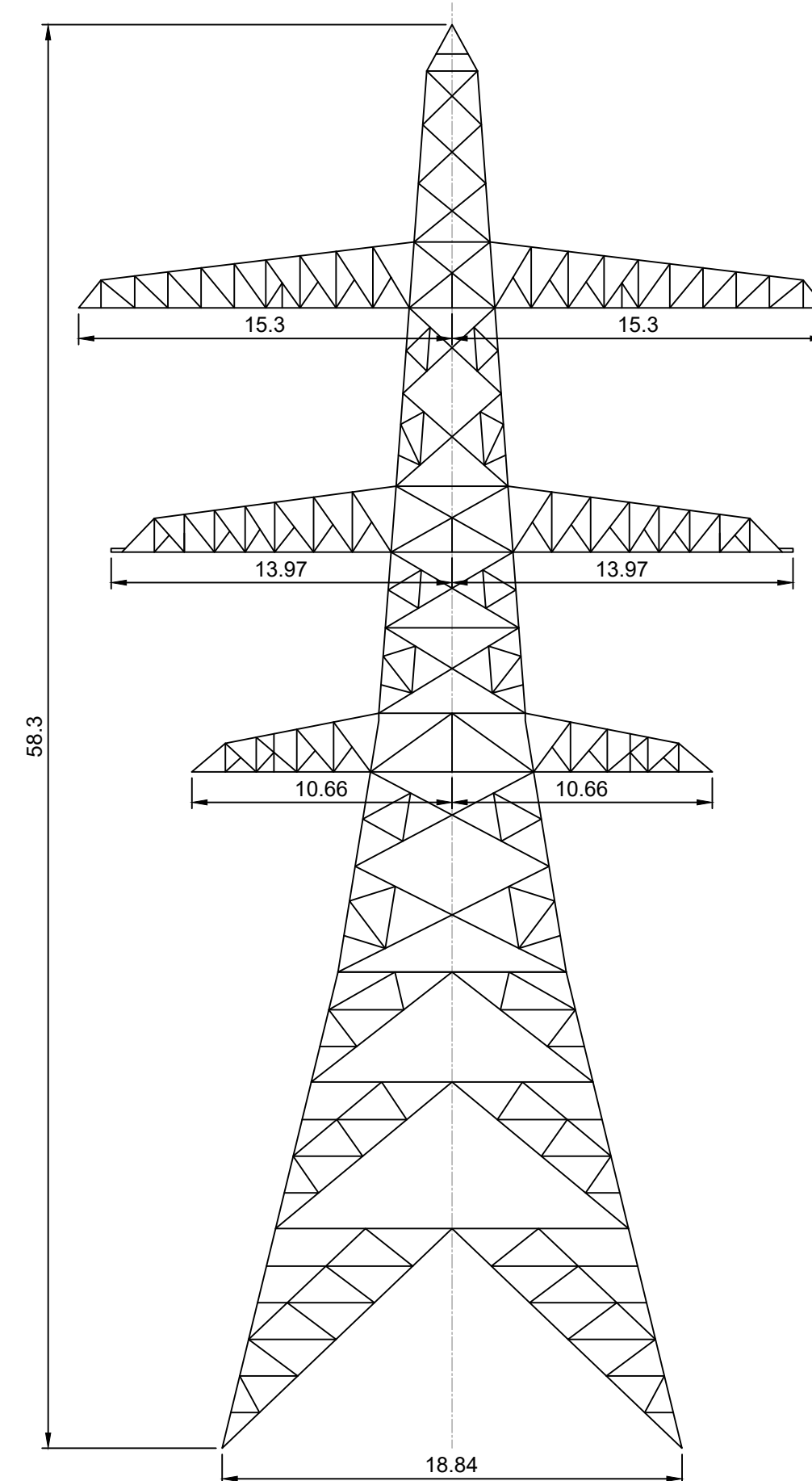




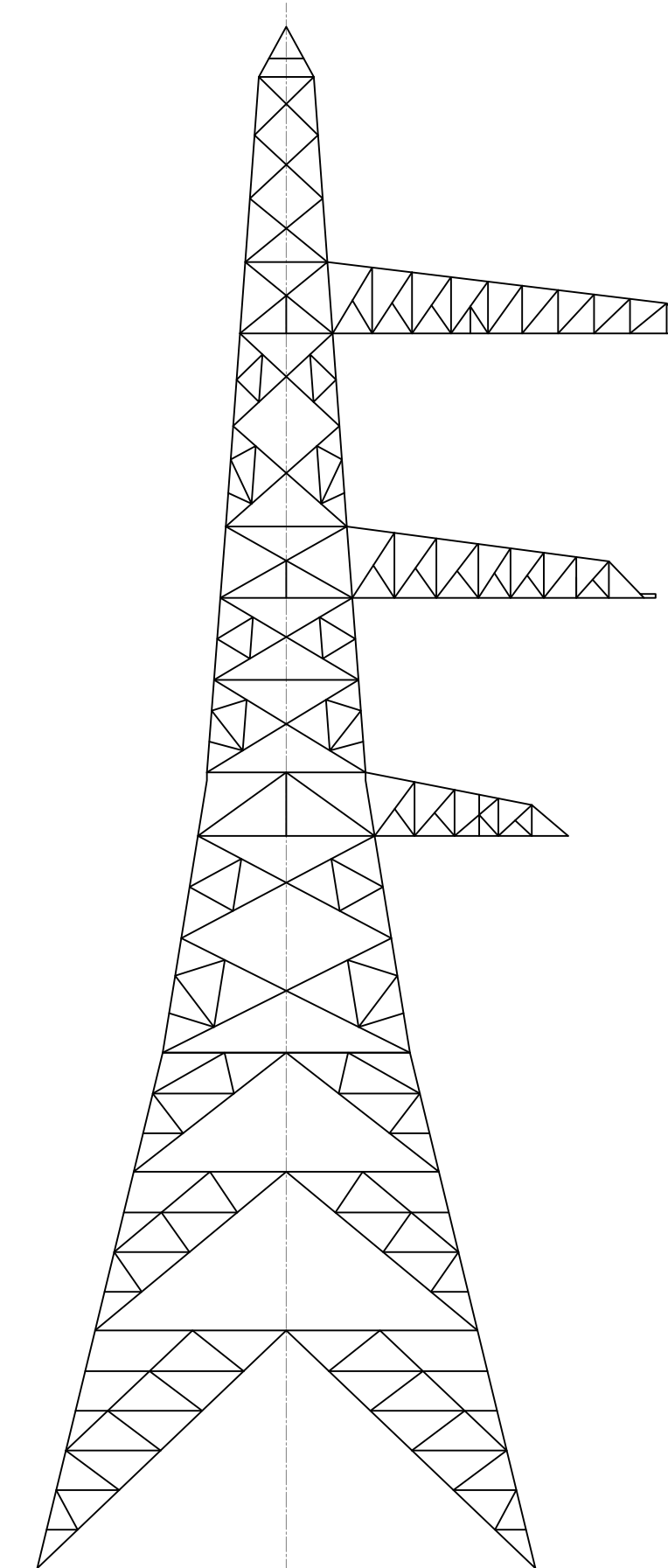
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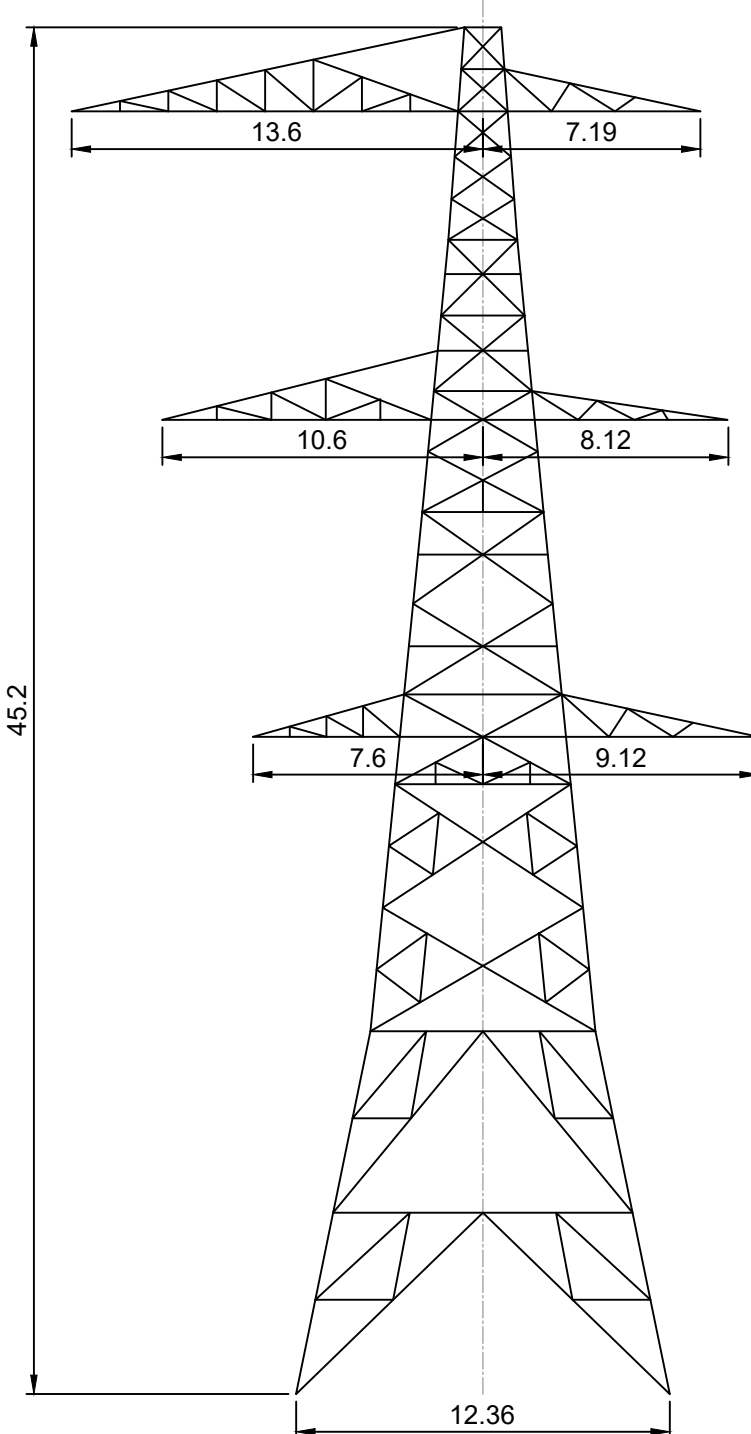
TRANSVERSE FAC
L6M D30



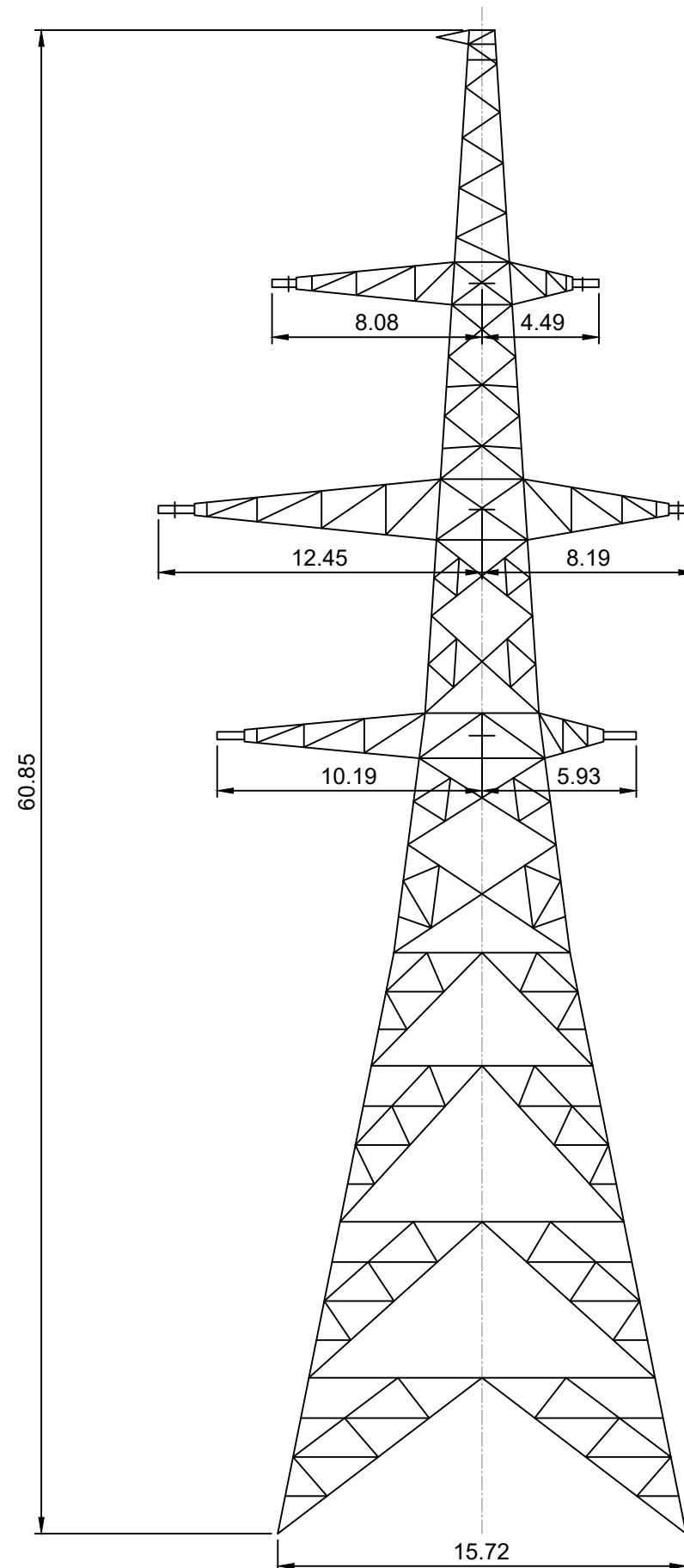
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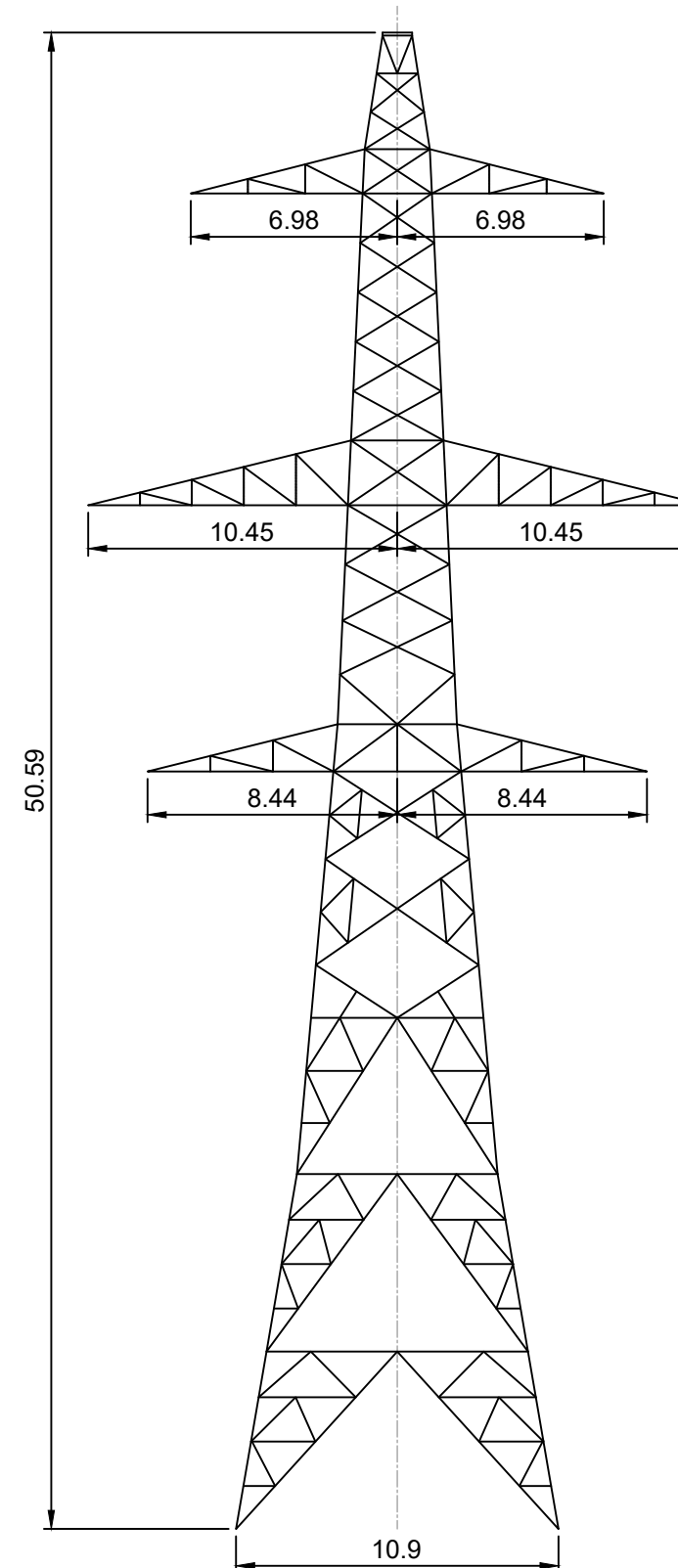
LONGITUDINAL FACE



TRANSVERSE FACE
L6M ST STD



TRANSVERSE FACE
L12 D55 E12



TRANSVERSE FACE
L6M D STD

TOWER DETAILS		
TOWER ID	TOWER TYPE	X & Y COORDINATES
4ZH112B	L6m ST STD	444463.0, 389717.2
4ZH112C	L12 DT/DJ E9	444438.6, 389693.5
4ZH113	L12 DT/DJ E9	444348.7, 389625.0
4ZH114	L6m D30 E9	443995.3, 389659.6
4ZH115T (OPTION A)	M4 MAST E9	443929.1, 389694.7
4ZH115T (OPTION B)	L6m D30 E9 (TEMP)	443929.1, 389694.7
4ZV190	L12m DT/DJ E9	444485.8, 389407.3
4ZV189	L6m D30 E9	444508.8, 389239.8
4ZV188 (OPTION A)	L6m D STD	444477.8, 389031.5
4ZV188 (OPTION B)	L6m D30 STD	444477.8, 389031.5
4ZV187	L12m D55 E12	444399.5, 388690.1
4ZV186T (OPTION A)	M4 MAST E9	444388.4, 388642.8
4ZV186T (OPTION B)	L6m D30 E9 (TEMP)	444388.4, 388642.8



NOTES

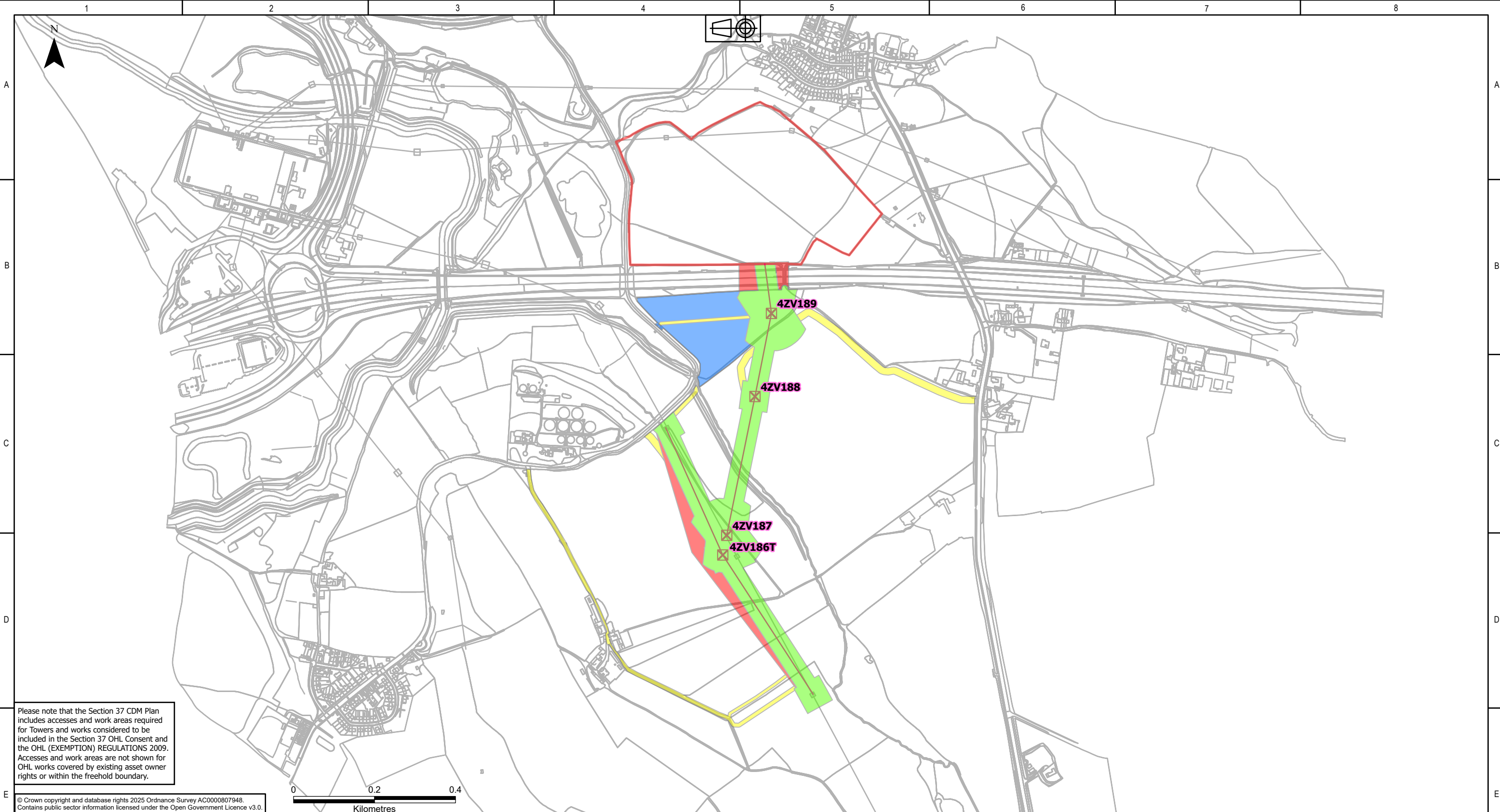
1. REFER TO SHEET 001 OF 002 FOR DETAILS.

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P04	06/10/26	Tower ID updated, Tower heights for L6m D & D30 and L12 D55 & DJ/DT, 42V/188 Option B added to sheet 2	KP	VS	RMJB	RMJB	
P03	10/06/26	Issued for review & acceptance	MM	VS	RMJB		
P02	03/06/26	Issued for comments	MM	VS	RMJB	RMJB	
P01	15/05/26	First issue	MM	VS	RMJB	RMJB	
Rev.	Date	Comment	Drw by	Check	Rev by	Appr.	

NATIONAL GRID INVESTMENT NUMBER:	101812-205848
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 <p>National Grid plc, Warwick Technology Park, Gatlowes Hill, Warwick, CV34 6DA</p>		<p>Site BRINSWORTH TO CHESTERFIELD</p>	
<p>Contractor</p> <div style="text-align: center;">  <p>WSP House, 70 Chancery Lane, London, WC2A 1AF, UK T +44 (0) 207 314 5000, F +44 (0) 207 314 5111 wsp.com</p> </div>		<p>Title LONG LEANE 400KV SUBSTATION S37 OVERHEAD WORKS PLAN SHEET 02</p>	
<p>Purpose of issue SHARED FOR REVIEW AND ACCEPTANCE</p>			<p>Status S5</p>
<p>Contractor Drawing No. EDEU-WSP-OH70-LONL4-PLN-OC-000002</p>			<p>Revision P04</p>
<p>Customer Drawing No.</p>		<p>Sheet 002 of 002</p>	<p>Issue 01</p>
<p>Drawn MM</p>	<p>Checked VS</p>	<p>Reviewed RMJB</p>	<p>Approved RMJB</p>
		<p>Date 15/05/2026</p>	<p>Scale 1:250</p>
			<p>Size A1</p>



Please note that the Section 37 CDM Plan includes accesses and work areas required for Towers and works considered to be included in the Section 37 OHL Consent and the OHL (EXEMPTION) REGULATIONS 2009. Accesses and work areas are not shown for OHL works covered by existing asset owner rights or within the freehold boundary.

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KEYPLAN

Legend

- Freehold Boundary
- Accesses including Trackway Matting and Haul Road accesses
- 50m width working area along OHL Alignment with Tower Laydown Areas (70m x 70m) and "Bowtie" Machine Pulling Positions at Tension Tower Locations
- Temporary Compound Location
- Temporary Construction Rights
- Tower Requiring Section 37 Consent
- OHL Requiring Section 37 Consent

NATIONAL GRID INVESTMENT NUMBER: 100268

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P04	10/9/2026	Tower nomenclature updated	GT	JA	RB	RB
Rev.	Date	Comment	Drw by	Check	Rev by	Appr.

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National Grid plc, Warwick Technology Park, Gallows Hill, Warwick, CV34 6DA

Contractor

Drawn GT

Checked JA

Site

Brinsworth to Chesterfield Project

Title

Figure 2-3
Section 37
Construction, Design and Management Plan
Long Lane 400kV Substation

Purpose of issue

For Information

Status

S5

Contractor Drawing No.

EDEU-WSP-OH70-LONL4-PLN-OC-000003

Revision

P04

Customer Drawing No.

03

Issue

A

Reviewed RB

Approved RB

Date

10/9/2026

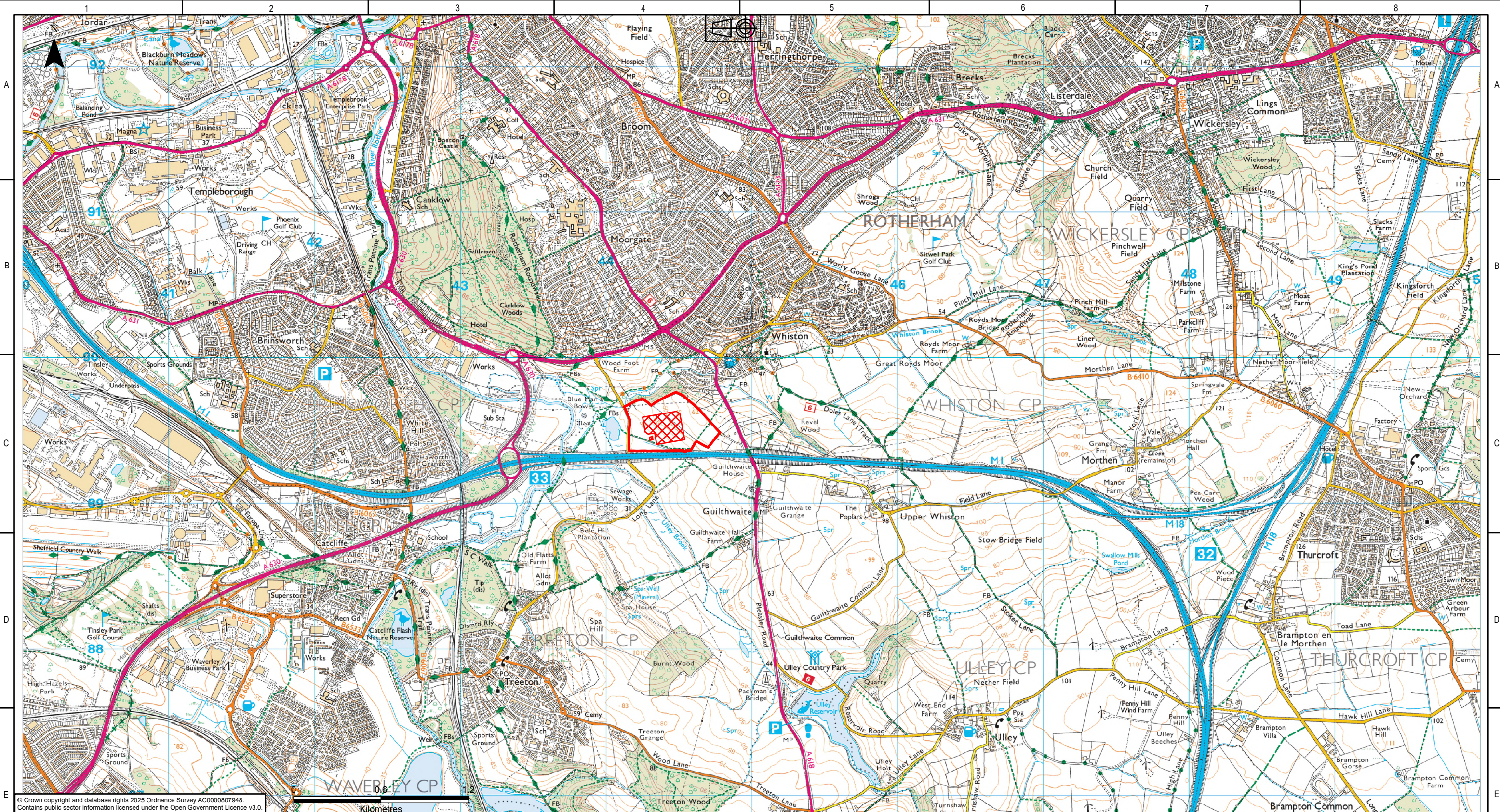
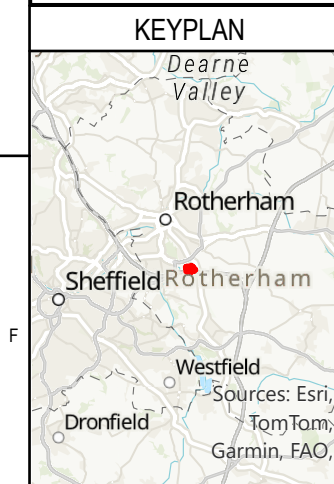
Scale

1:9,000

Size

A3

Sheet 001 of 001



Legend

- Long Lane 400kV Substation Freehold Red Line Boundary
- Proposed Substation Platform

NATIONAL GRID INVESTMENT NUMBER: 100268						
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P01	6/10/2026	First issue	TS	JL	TR	TR
Rev.	Date	Comment	Drw by	Check	Rev by	Appr.

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National Grid plc, Warwick Technology Park,
Gallows Hill, Warwick, CV34 6DA

Contractor

Site Brinsworth to Chesterfield Project	
Title Figure 1-3 Section 37 Location Plan Long Lane 400kV Substation	
Purpose of issue For Information	Status S5
Contractor Drawing No. EDEU-WSP-OH72-LONL4_-PLN-OC-000001	Revision P01
Customer Drawing No. 01	Sheet 001 of 001
Issue A	Size A3
Reviewed KT	Approved TR
Date 6/10/2026	Scale 1:25,000

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Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

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