Meridian Solar Farm

EN010169

Volume 7

Other Documents

7.8 Electric and Magnetic Fields Compliance Report

APFP Regulation 5(2)(q)

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

March 2026

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1. Introduction

1.1. Report Purpose

1.1.1. This assessment has been undertaken to assess the potential electric and magnetic fields (EMF) generated by proposed electrical equipment within the Meridian Solar Farm ('the Scheme') with respect to safe levels for human exposure.

1.1.2. The Scheme would comprise the construction, operation (including maintenance) and decommissioning of a solar PV electricity generating station with associated infrastructure, including co-located Battery Energy Storage System (BESS), Inter-Array Connections to link the land parcels that form the Solar Development Areas, and an up to 13km overhead line Grid Connection (with one short undergrounded section) which would run north towards a point of connection (PoC) at the proposed Weston Marsh B National Grid Electricity Transmission (NGET) substation, to the north of Weston. The Scheme is shown illustratively in Figure 1-1 below.

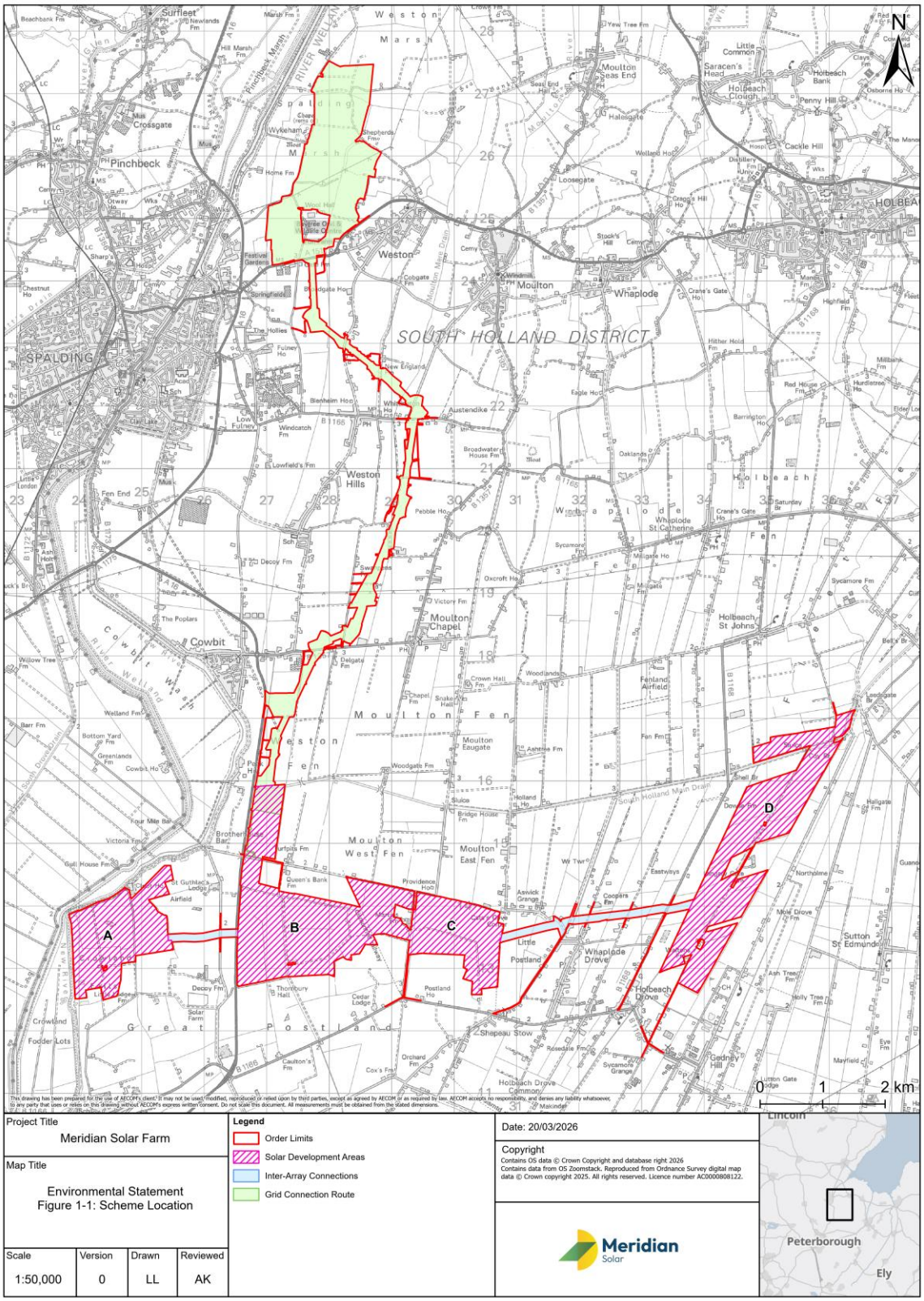
1.1.3. The Solar PV generating station, associated BESS, on-site substations and other associated infrastructure would be located within four land parcels (A, B, C and D) referred to collectively as the Solar Development Area, as shown in Figure 1-1.

1.1.4. The Inter-Arrays would be the areas within which 132kV connection cables (the 'Inter-Array Connections') would link the land parcels of the Solar Development Area. The configuration of the Inter-Array Connections (132kV) would comprise underground cabling between Land Parcels A and B ('the Underground Inter-Array') and an overhead line between Land Parcels C and D ('the Overground Inter-Array').

1.1.5. The Grid Connection Route would be the area between the Solar Development Area and the National Grid Weston Marsh B Substation in which a 400kV overhead line (the 'Grid Connection') would be located. There is one section where the Grid Connection would route underground to avoid conflicts with an existing 132kV overhead line. Cable Sealing End Compounds (CSECs) would join the proposed underground cable at that section with the proposed overhead line.

1.1.6. A full description of the Scheme is included in **ES Chapter 2: The Scheme** (Doc Ref. 6.1).

Figure 1-1: Scheme Layout



1.2. Emissions

1.2.1. All electrical equipment emits EMFs. Power cables produce EMFs, which without minimum safety clearances, can potentially affect human health. EMFs from underground cables are generally less than EMFs from overhead lines because emissions from adjacent conductors within a cable tend to cancel each other out. When assessing the impacts of overhead power lines, it is important to consider the impact of both electric and magnetic fields. Underground cables generally cause a negligible electric field above ground but can cause a noticeable magnetic field, which is dependent on the current in the conductors.

1.3. Standards in the UK

1.3.1. The UK Policy on public exposure limits to EMF radiation is designed to comply with the 1998 International Commission on the Non-Ionizing Radiation Protection (ICNIRP) guidelines[1]. In 2010, ICNIRP produced new guidelines, but these have not been incorporated into UK Policy. The public exposure limits in UK policy define reference levels for electric and magnetic fields. Where field levels exceed these reference levels in significantly occupied spaces, further investigation is warranted. Further information can be found in Section 3 of this report.

1.4. Assessed Infrastructure

1.4.1. The Scheme will include several EMF sources, as summarised below[2]:

- Solar Development Area:
  - Solar stations supporting the ground-mounted solar PV panels in parcels A, B, C and D;
  - Battery Energy Storage System (BESS) Compound;
  - On-Site Substation Compounds (one 400 kV substation and three 132 kV substations);
  - On-site underground cabling (low and medium voltage);

[1] ICNIRP (1998) INCIRP Guidelines For Limiting Exposure to Time Varying Electric, Magnetic and Electromagnetic Fields (up to 300 GHz) Available at: https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf. [Accessed 25 October 2025].
[2] The maximum voltages for overhead cables, underground cables, transformers/PV inverters and the substation have been assumed to account for a worst-case scenario.

- Inter-Array Connection: Underground cabling with an operating voltage of 132kV and overhead line with an operating voltage of 132kV;
- Grid Connection Route: 400kV overhead line (with one undergrounded section) to the planned National Grid Weston Marsh B Substation.

1.4.2. In addition, the Scheme has been considered cumulatively with:

- Existing overhead lines, with varying operating voltages;
- Proposed 400kV Grimsby to Walpole and Weston Marsh to East Leicestershire overhead lines.

1.4.3. The technical information considered in this assessment is presented in Table 1-1 below.

Table 1-1: Assessed infrastructure technical information

Assessed Infrastructure Technical Information		
Underground cables	Voltages	132kV and 400kV trefoil single-core cables
	Minimum Depth	0.9m
Overhead powerlines	Voltages	11kV, 33kV, 132kV and 400kV overhead lines
	Minimum height	6.7m for 11kV, 33kV and 132kV overhead line; 8.1m for the 400kV overhead lines.

1.4.4. The locations of assessed infrastructure are shown in Figures 2 and 3, respectively:

- Proposed Scheme infrastructure:
  - 400kV Overhead lines - Grid Connection Route (Yellow line);
  - 132kV Overhead lines (Cyan line);
  - 400kV Substation and BESS Compound (Light Blue polygon);
  - 132kV Substation (Yellow polygons);
  - 132kV Underground cables (Green line);

- Solar Station (Circle Placemark);

- Proposed Grimsby to Walpole and Weston Marsh to East Leicestershire cumulative schemes:
  - 400kV Overhead lines - Grimsby to Walpole and Weston Marsh to East Leicestershire (Lavender line);
  - Assumed location of National Grid Weston Marsh Substations (Orange Polygon);
- Existing infrastructure:
  - 11kV Overhead lines – Existing (Pink line);
  - 33kV Overhead lines – Existing (Red line);
  - 132kV Overhead lines – Existing (Red line).

1.4.5. Additional information highlighted in Figure 1-2 on the following page includes solar panels (Dark Blue polygon).

1.4.6. More detailed sections are shown within the technical assessment sections of this report. Figures 1-2 and 1-3 are intended to provide an overview of the existing environment and proposed infrastructure.

Figure 1-2: Assessed infrastructure locations – Solar Development Area

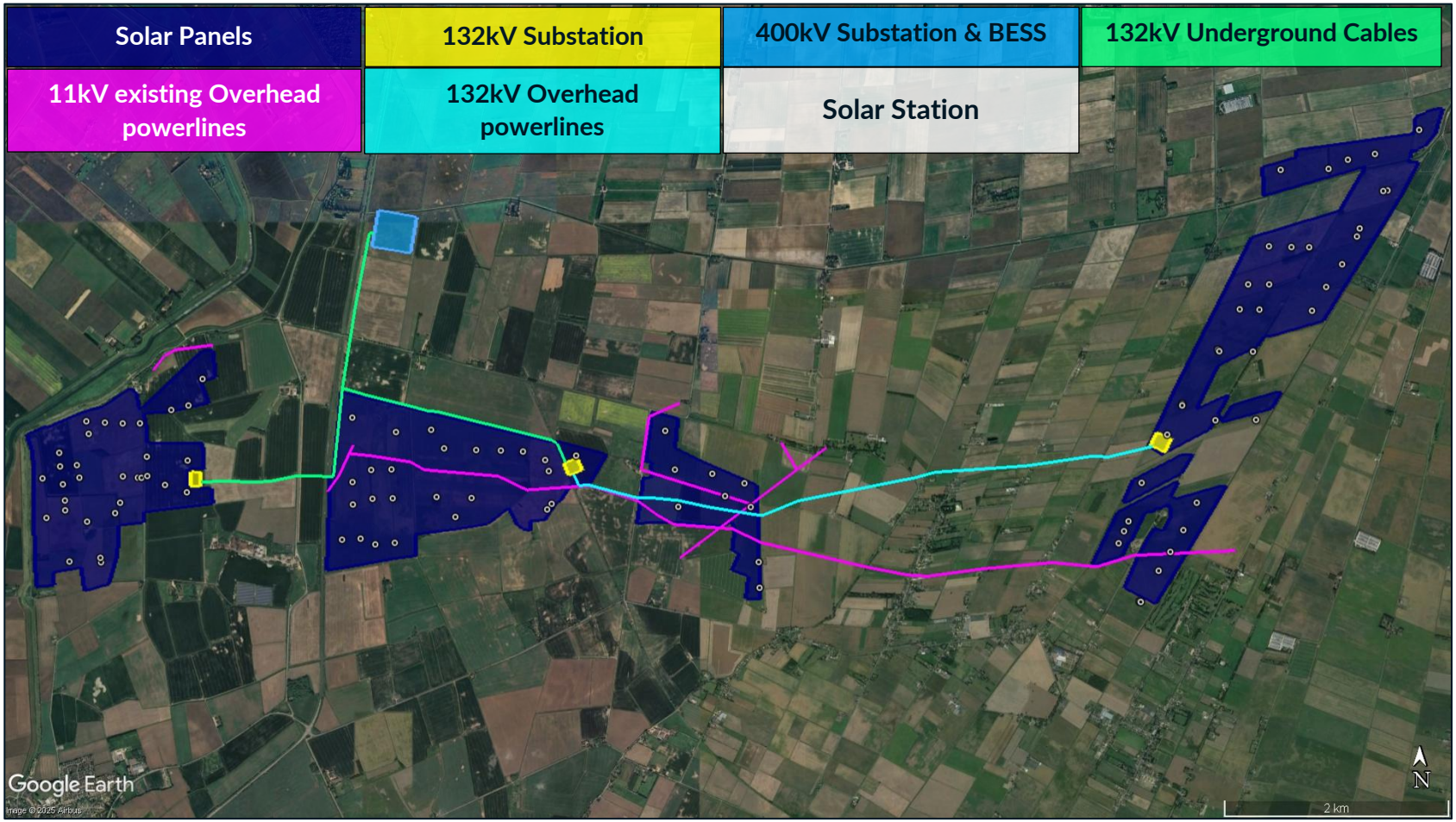
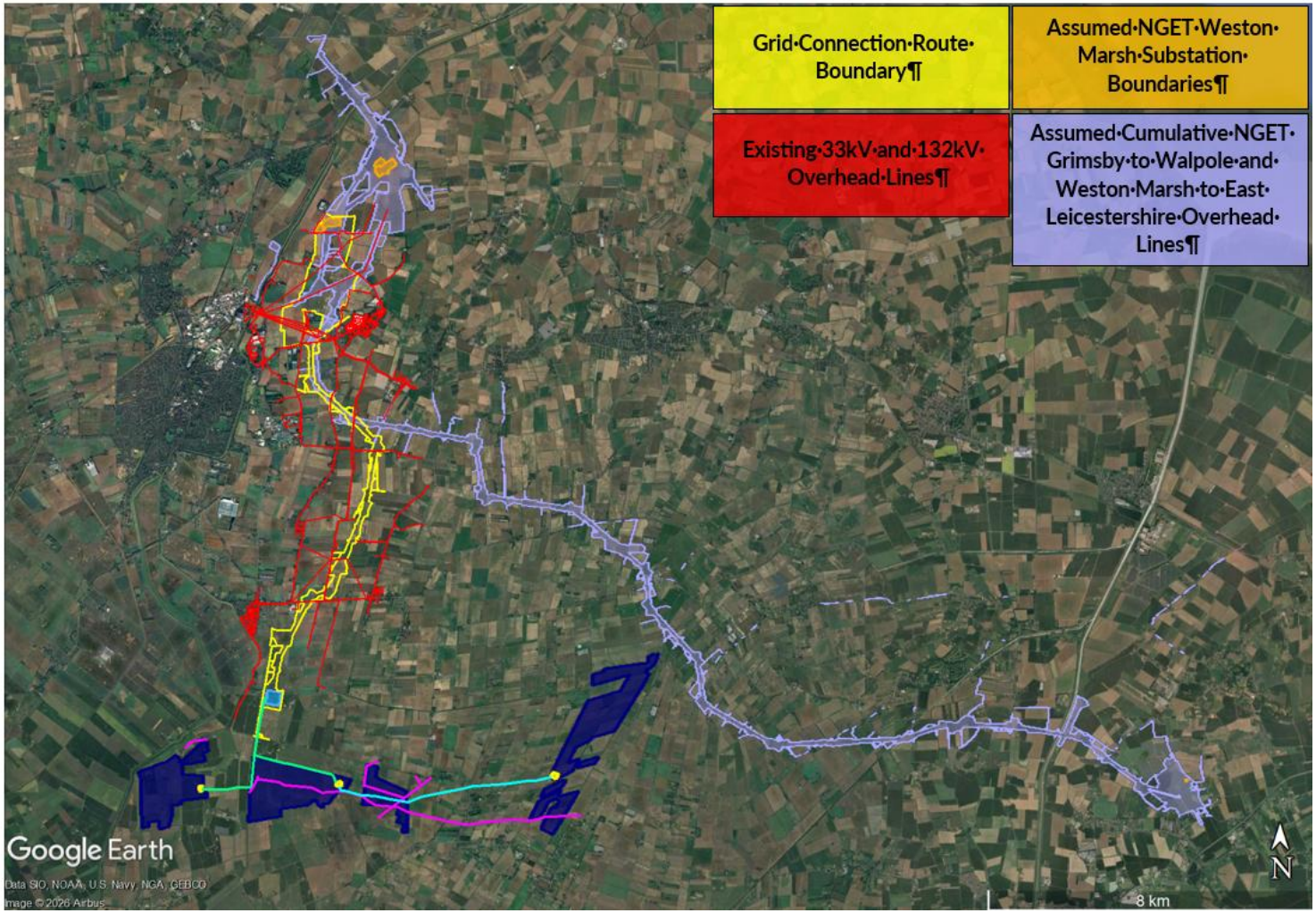


Figure 1-3: Assessed infrastructure locations – Existing 33kV and 132kV Overhead lines, 400kV Overhead lines, 400kV underground cables and National Grid Weston Marsh Substation



2. Technical Background

2.1. Emissions

2.1.1. All electrical equipment emits EMFs. Power cables produce both electric and magnetic fields, which can potentially affect human health without minimum safety clearances. EMFs from underground cables is generally less than EMFs from overhead lines because emissions from adjacent conductors within a cable tend to cancel each other out. When assessing the impacts of overhead lines, it is important to consider the impact of both electric and magnetic fields.

2.1.2. Underground cables generally cause a negligible electric field above ground but can cause a measurable magnetic field, which is dependent on the current in the conductors.

2.2. Electromagnetism

2.2.1. The movement of an electric charge causes electric and magnetic fields to be produced in the space surrounding the charge. Human exposure to such fields can cause health problems if they are persistent and/or they are of high strength. The magnitude of the effects is dependent on both the field strength and the exposure time.

2.3. Potential Effects of EMFs

2.3.1. The potential effects on human health caused by time-varying magnetic fields at sufficiently high levels, such as those generated by alternating current (AC) cables, are due to the potential effects of the induced current on the functions of the central nervous system. At low frequencies and field strengths typically encountered in everyday environments, such as near power lines or AC cables, the induced currents are generally too small to produce these effects. Time-varying electric fields can also interact with the body by inducing surface charges and weak internal currents, which at sufficiently high levels may lead to sensory effects such as tingling or micro-shocks. There are various international bodies which provide maximum safe exposure levels to time-varying EMFs.

2.3.2. Various sources of information relating to safe exposure levels have been reviewed as part of this study. The UK Policy on public exposure limits to EMF radiation is designed to comply with the 1998 ICNIRP (International Commission on the Non-Ionizing Radiation Protection) guidelines. In 2010, ICNIRP produced new guidelines, but these have not been incorporated into UK Policy, as the

earlier 1998 limits are more precautionary and therefore, have been retained to remain the basis for UK guidance. The public exposure limits in UK policy define reference levels for electric and magnetic fields. Where field levels exceed these reference levels in significantly occupied spaces, further investigation is warranted.

2.3.3. In addition, the Department of Energy and Climate Change (DECC) has published a Code of Practice on Compliance with EMF Public Exposure Guidelines (2012)[3], which provides practical guidance on assessing compliance with the ICNIRP reference levels in the UK.

2.3.4. Another relevant resource consulted is the EMFs.info[4] webpage, where the UK electricity industry has collected relevant studies on safe limits on exposure in the UK and elsewhere in the world. The relevant sections are summarised in the next section of this report.

2.4. EMFs from Home Electrical Equipment

2.4.1. The World Health Organization (WHO) publishes data regarding EMFs, including the following typical levels for home electrical equipment, shown in Table 2-1 below[5]. These values are presented to give a sense of the typical EMF environment within a home and to provide a practical reference point for comparison with EMF levels from electrical infrastructure.

Table 2-1: Typical emissions from home electrical equipment

Appliance	Magnetic field strength (µT) (at 3cm)	Electric field strength (V m^{-1}) (at 30cm)
Hair Dryer	6 – 2,000	80
Iron	8 – 30	120
Vacuum Cleaner	200 – 800	50

[3] DECC (2012) Power Lines: Demonstrating compliance with EMF public exposure guidelines A voluntary Code of Practice. Available at: https://assets.publishing.service.gov.uk/media/5a796799ed915d07d35b5397/1256-code-practice-emf-public-exp-guidelines.pdf. [Accessed 8 December 2025]

[4] EMFs.info webpage. Available at: https://emfs.info/. Last Accessed: November 2025

[5] World Health Organization webpage. Available at: https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields

Appliance	Magnetic field strength (µT) (at 3cm)	Electric field strength (V m^{-1}) (at 30cm)
Refrigerator	0.5 – 1.7	120
Television	2.5 - 50	60

2.5. EMF Reduction with Distance

2.5.1. EMF levels reduce with distance, which means, for example, the typical magnetic field from a vacuum cleaner reduces from 800micro-Tesla (µT) to 2µT when the separation distance increases from 3cm to 100cm.

2.5.2. This means EMF levels from the Scheme infrastructure will reduce, including towards a receptor, with an increase in distance in any direction.

3. EMF guidance

3.1. Overview

3.1.1. The Electricity Networks Association[6] provides a comprehensive overview of EMFs and the issues associated with these on their webpage: EMFs.info[7]. Regarding health issues caused by EMFs, they state the following[4]:

3.1.2. *"A vast amount of research has been carried out over the past 40 years investigating the potential health effects of EMFs. Despite all that research, there are no proven health effects below the exposure limits. However, there is one area where some uncertainty exists and that's around childhood leukaemia. The evidence for this comes from statistical studies, which have found a small increased risk in childhood leukaemia incidence, for children born within 200 m of an overhead line or those with higher average daily exposure (more than 0.4 μT). Studies have been conducted on mice and rats which show they do not develop the disease when exposed to EMFs in the laboratory. It is unclear whether the increase in childhood leukaemia is caused by EMFs or something else entirely. Therefore, the uncertainty is a weak statistical association only and no causation has been found."*

3.2. Exposure limits in the UK

3.2.1. As set out in the previous section, the limits in the UK come from the 1998 ICNIRP guidelines. The original guidance in 1999 specified:

- Basic Restrictions
  - These are the levels at which EMFs are potentially harmful to humans. This is a current density[8] given in mA m^{-2} (milliamps per metre squared).
- Reference Level (Investigation Level)
  - Provided for practical exposure assessment purposes to determine whether the basic restrictions are likely to be exceeded. Compliance

[6] This is an industry body for the companies which run the UK and Ireland's energy networks. The group comprises 14 members including National Grid.

[7] EMFs.info. Available at: https://www.emfs.info/research/current-evidence-on-health/childhood-leukaemia. [Accessed 8 December 2025]

[8] Current density is the amount of electric current flowing through a unit area.

with the reference level will ensure compliance with the relevant basic restriction.

- Field Actually Required
  - This is the field strength at which the basic restriction is likely to be exceeded.

3.2.2. The values for the above are stated in the ICNIRP 1998 paper and are shown in Table 3-1 below. These are the public exposure values, not the occupational exposure values. Occupational exposure refers to EMF levels experienced by trained workers in environments where higher fields may occur as part of their job. Because these workers are aware of the risks and follow safety procedures, their allowable exposure limits are higher. Public exposure limits apply to the general population in homes, businesses, and public areas. Public limits are more conservative and are set at one-fifth of the occupational values.

Table 3-1: ICNIRP Exposure Limits 1998

ICNIRP 1998 – Public Exposure Limits				
Basic Restriction (mA m^{-2})	Magnetic Fields Reference Level (µT)	Electric Fields Reference Level (kV m^{-1})	Magnetic Field Actually Required (µT)	Electric Field Actually Required (kV m^{-1})
2	100	5	360	9

3.2.3. The reference levels in Table 3-1 have been considered within this analysis.

3.3. Height Above Ground Used for Testing Compliance

3.3.1. EMFS.info[7] specifically states the following with regard to the height to be used to test compliance:

"The standard height for measuring fields, especially from power lines, is 1 m above ground level ... This isn't just because it's a convenient round number, it's because roughly half way up the height of a standing person is actually the height that gives the best approximation to the induced current in the body."

3.4. Safe Levels – Summary

3.4.1. The values of interest are those shown in Table 3-1 above. Effectively, this means that in locations of significant exposure time, such as residences, levels should be below:

- 100µT (magnetic fields);
- $5kVm^{-1}$ (electric fields).

3.4.2. Values exceeding the limits above, at one metre above ground level (agl), would suggest that further investigation is required.

4. Technical Assessment

4.1. Inter-Array Connection: 132kV Underground Cables

4.1.1. The data below shows the magnetic fields for 132kV cables, which represent the typical voltage for the underground cables in the Inter-Array of the Scheme. As mentioned above, the electric field would be negligible from a buried cable. The relevant charts for the magnetic fields are shown in Figure 4-1 below. Table 4-1 below and on the following page provides the associated indicative numerical values at set distances.

Figure 4-1: Typical magnetic fields associated with a 132kV Underground cable

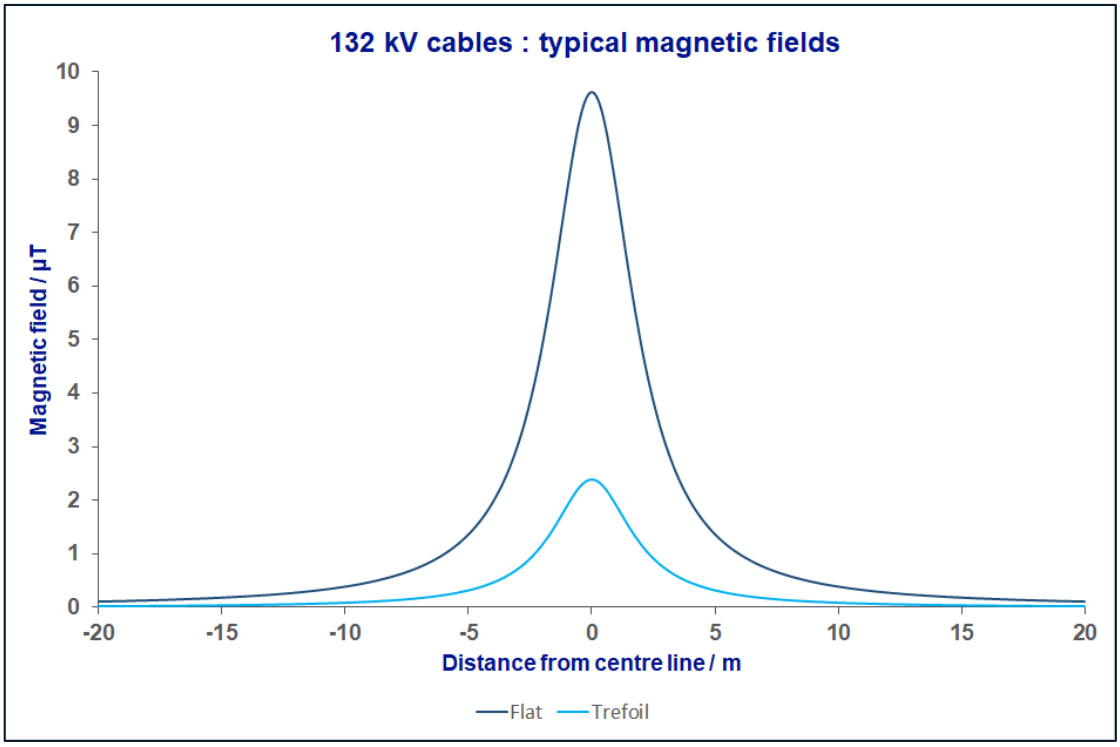


Table 4-1: Typical magnetic field levels for an Underground 132kV cable

Distance from Centreline (m)	Magnetic Field (single-circuit 132 kV 3-core cable at 0.9 m depth)
0	9.62 µT
5	1.33 µT
10	0.38 µT

Distance from Centreline (m)	Magnetic Field (single-circuit 132 kV 3-core cable at 0.9 m depth)
20	0.10 µT

4.2. Inter-Array Connection: 132kV Overhead Lines

4.2.1. The relevant chart for the typical magnetic field from the 132kV overhead lines in the Inter-Array is shown in Figure 4-2, and the relevant chart for the typical electric field is shown in Figure 4-3. Tables 4-4 and 4-5 provide the associated indicative numerical values at set distances.

Figure 4-2: Typical magnetic fields associated with 132kV overhead lines

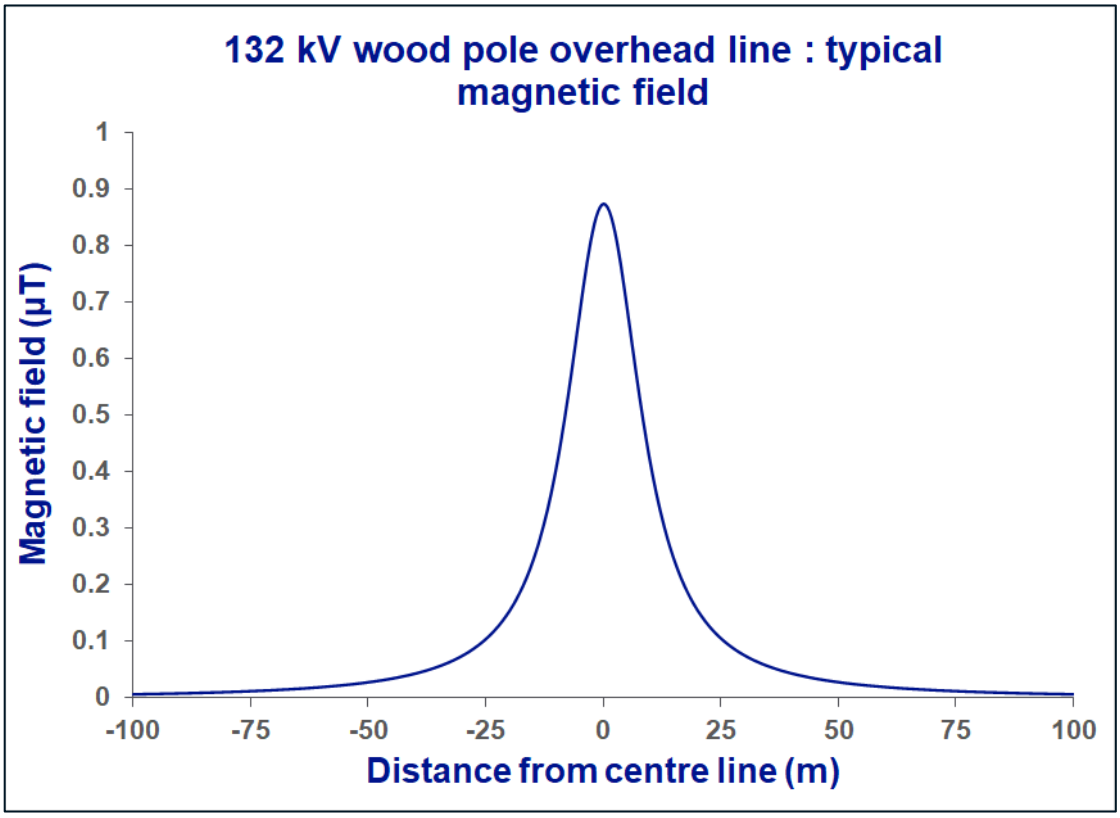


Table 4-2: Typical magnetic field levels for an overhead 132kV lines

Distance from Centreline (m)	Magnetic Field (Directly Under Line)
0	1 µT
50	0.03 µT

Distance from Centreline (m)	Magnetic Field (Directly Under Line)
100	<0.01 µT

Figure 4-3: Typical electric fields associated with a 132kV overhead lines

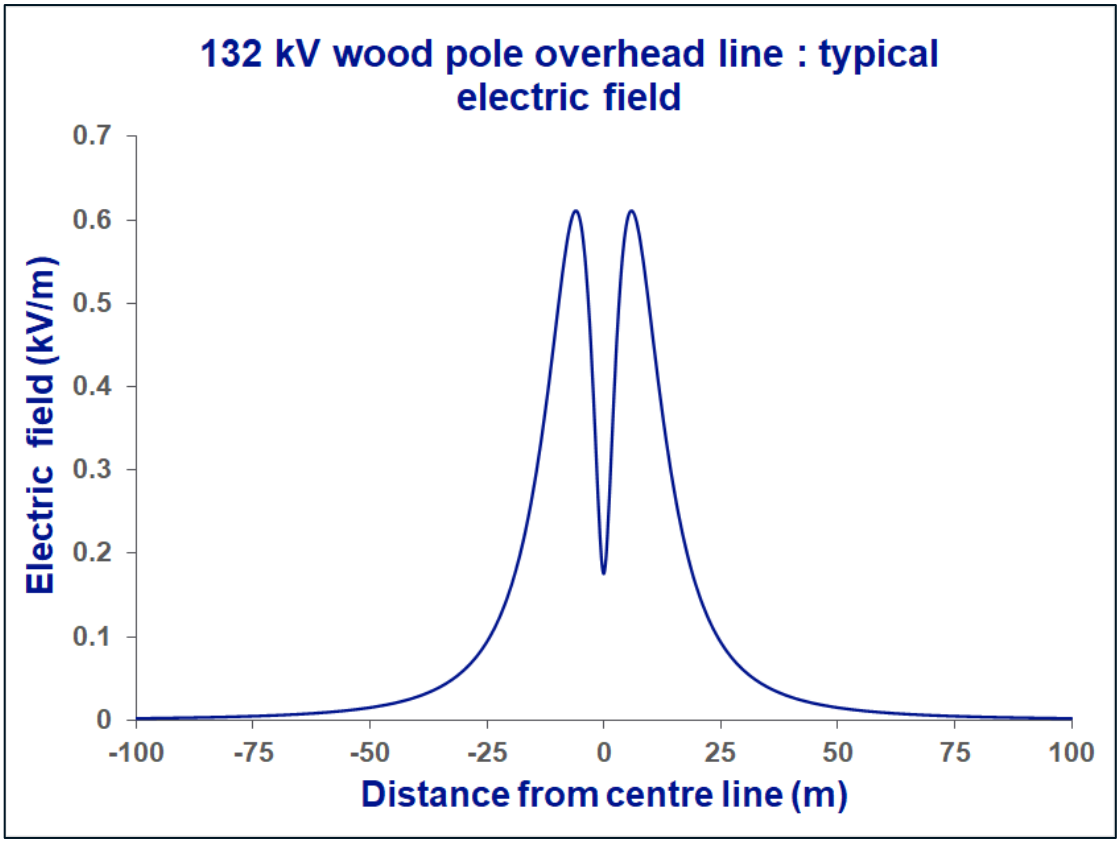


Table 4-3: Typical electric field levels for an overhead 132kV lines

Distance from Centreline (m)	Electric Field (Directly Under Line)
0	0.6kV/m
50	0.02kV/m
100	<0.01kV/m

4.3. Grid Connection 400 kV Overhead Lines

4.3.1. The data below and on the following pages show magnetic and electric fields for a 400kV overhead line. The relevant chart for the typical magnetic field is shown

in Figure 4-4 below, and the relevant chart for the typical electric field is shown in Figure 4-5 on the following page. Tables 4-4 and 4-5 on the following pages provide the associated indicative numerical values at set distances.

Figure 4-4: Typical magnetic fields associated with a 400kV overhead line

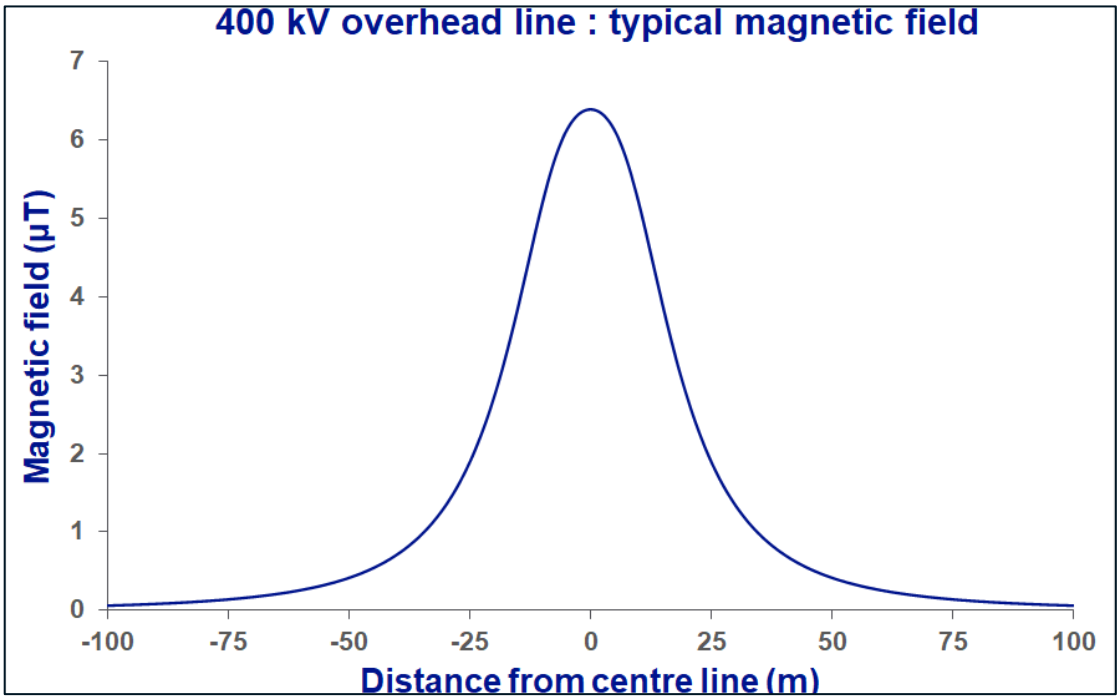


Table 4-4: Typical magnetic field levels for an overhead 400kV line

Distance from Centreline (m)	Magnetic Field (Directly Under Line)
0	6.4µT
50	0.4µT
100	0.1µT

Figure 4-5: Typical electric fields associated with a 400kV overhead lines

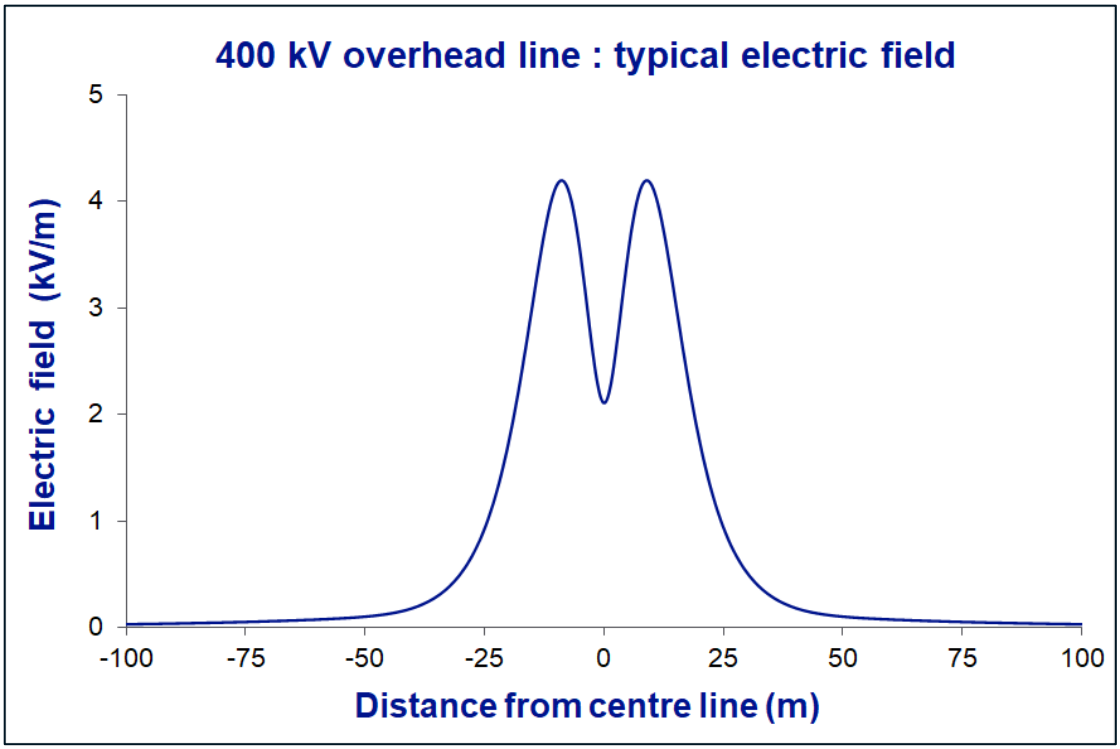


Table 4-5: Typical electric field levels for an overhead 400kV lines

Distance from Centreline (m)	Electric Field (Directly Under Line)
0	4.2kV/m
50	0.1kV/m
100	0.0kV/m

4.4. Grid Connection 400kV Underground Cable

4.4.1. The data below show the magnetic fields associated with a 400kV underground cable. The relevant chart showing the typical magnetic field from the 400kV underground cables is presented in Figure 4-6, and Table 4-6 presents the corresponding indicative numerical values at set distances from the cable route.

Figure 4-6: Typical magnetic fields associated with 400kV underground cables

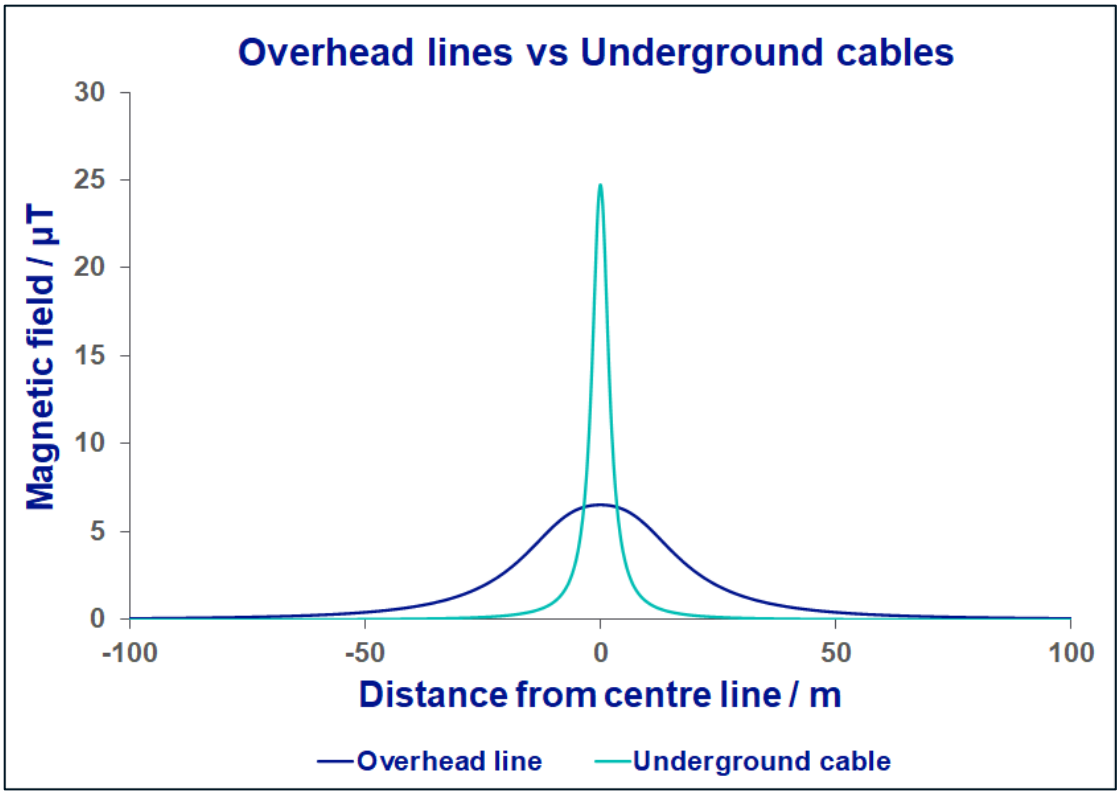


Table 4-6: Typical magnetic fields associated with 400kV underground cables

Distance from Centreline (m)	Magnetic Field (single-circuit 400 kV 3-core cable at 0.9 m depth)
0	25 µT
5	6 µT
10	0.5 µT
20	0.0 µT

4.5. Comparison with Public Exposure Limits

4.5.1. A comparison of the calculated EMFs with the public exposure limits previously referenced in this report for magnetic and electric fields is presented in Table 4-7.

4.5.2. The dataset provided typical values for the configurations that have been evaluated.

4.5.3. Electric fields are not considered for underground cables as the soil and cable insulation provide effective shielding, leaving only magnetic fields relevant for EMF assessment.

Table 4-7: Comparison against public exposure limit values

Type of Line	Recommended minimum Clearance Distance (m)	Estimated typical Magnetic Field (μT)	Estimated typical Electric Field (kV/m)
Inter-Array Connection 132kV Underground cable	None	9.62 (below 100 limit)	-
Inter-Array Connection: 132kV Overhead lines	None	1 (below 100 limit)	0.6 (below 5 limit)
Grid Connection: 400kV Overhead lines	None	6.4 (below 100 limit)	4.2 (below 5 limit)
Grid Connection: 400kV Underground cable	None	25 (below 100 limit)	-

4.5.4. This shows that clearance distances are not required for any proposed 132kV overhead lines and underground cables in the Inter-Array. The table highlights that the typical fields produced by the Inter-Array are significantly below the acceptable exposure limit, and significant effects upon health are not predicted.

4.5.5. Both the typical magnetic and electric field levels for the Grid Connection 400kV overhead line are below the reference level from the public exposure limits in UK policy.

4.5.6. When compared to the maximum magnetic fields produced by household electrical appliances[9] such as microwaves and washing machines (50µT), the typical magnetic fields from all proposed overhead lines and underground cables are lower. The maximum electric fields produced by household electrical appliances (0.18kV/m-1) is, however, less than the overhead powerlines.

4.5.7. For users of roads and Public Rights of Way (PRoWs) that run near the overhead line and agricultural workers on fields, any exposure to electric or magnetic fields is expected to be minimal due to the transient nature of such exposure. Roads, PRoWs and agricultural fields are typically not continuously occupied; rather, they represent moving receptors, as opposed to residential dwellings or workplaces in buildings.

4.6. EMFs from Other Sources

PV Inverters and Transformer Stations

4.6.1. Sources of EMFs other than the underground cables, will include the PV inverters and transformer stations, housed within solar stations, positioned across the Solar Development Areas.

4.6.2. The PV inverters and transformer stations should be CE marked (Conformité Européene, or European Conformity marking), and/or 'UKCA' marked (UK Conformity Assessed). CE and UKCA marking indicates that a product has been assessed by the manufacturer and deemed to meet the safety, health and environmental protection requirements of the European Union[10] and the United Kingdom[11], respectively. CE marking requirements have been adopted and extended indefinitely in Great Britain since the UK left the EU in 2020. From 1 January 2021, the UKCA mark started to replace the CE mark for goods sold within Great Britain, and the CE mark continues to be required for goods sold in Northern Ireland. This will be confirmed prior to installation.

4.6.3. The relevant EU Directive for CE marking is Electromagnetic Compatibility Directive 2014/30/EU[12], and the relevant UK Statutory guidance for UKCA

[9] National Grid (und). Electric and Magnetic Fields. Available at: https://www.nationalgrid.com/electricity-transmission/document/141896/download. [Accessed 8 December 2025]
[10] Europa.eu. CE Marking. Available at: https://europa.eu/youreurope/business/product-requirements/labels-markings/ce-marking/index_en.htm. [Accessed 8 December 2025]
[11] DfBT (2024) Guidance : Using the UKCA Marking. Available at: https://www.gov.uk/guidance/using-the-ukca-marking. [Accessed 8 December 2025]
[12] EC (2014) Electromagnetic Compatibility (EMC) Directive 2014/30/EU. Available at: https://ec.europa.eu/growth/sectors/electrical-engineering/emc-directive_en. [Accessed 8 December 2025]

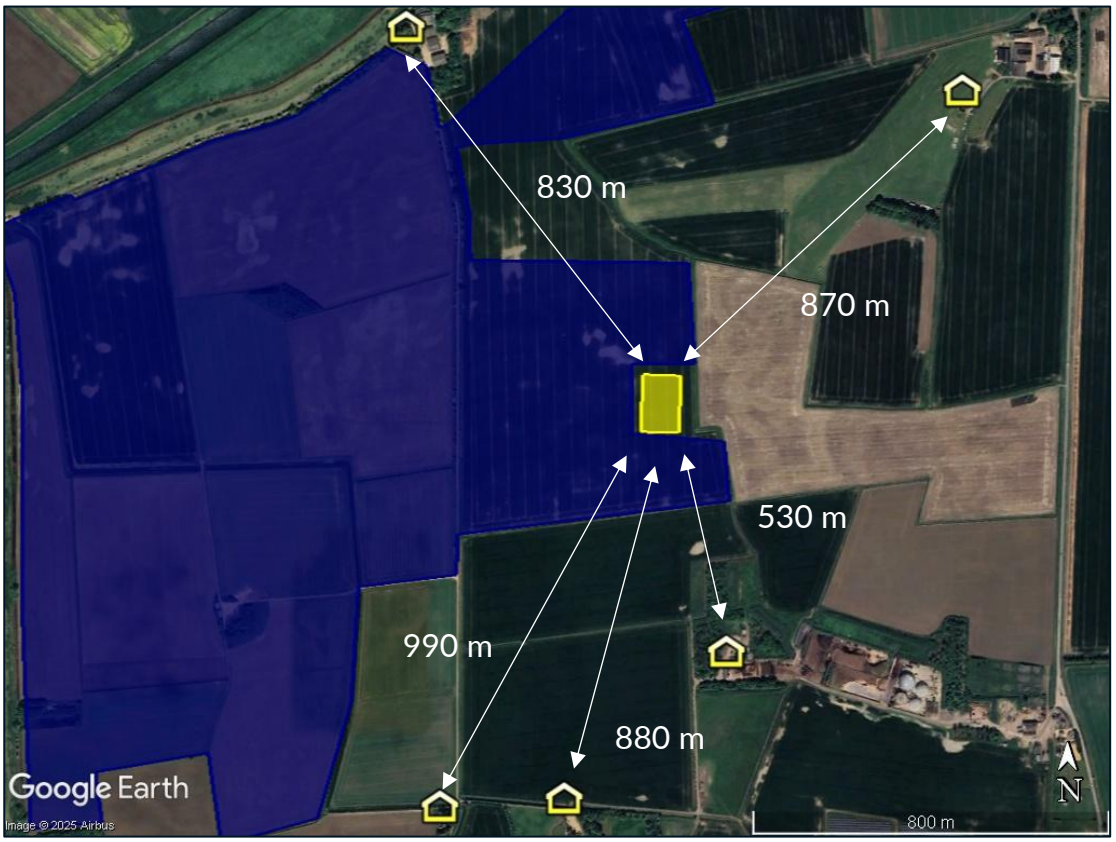
marking is the Electromagnetic Compatibility Regulations 2016[13]. This legislation would ensure that electrical and electronic equipment should not generate or be affected by EMF disturbance.

4.6.4. Additionally, the PV inverters and transformer stations are also predicted to produce fields at a lower level than that of underground cables, as the equipment will be housed in protective enclosures.

Substations and BESS

4.6.5. Other sources of EMFs associated with the Scheme include the substations and BESS. A detailed overview of the substations and BESS is presented in Figures 4-7 to 4-10 on the following pages.

Figure 4-7: Approximate distance between the Substation and the nearest dwellings/workplace



[13] OPSS (2025) Statutory guidance : Electromagnetic Compatibility Regulations 2016: Great Britain. Available at: https://www.gov.uk/government/publications/electromagnetic-compatibility-regulations-2016/electromagnetic-compatibility-regulations-2016-great-britain. [Accessed 8 December 2025]

Figure 4-8: Approximate distance between On-Site 400kV Substation and BESS Compound and the nearest dwellings/workplace

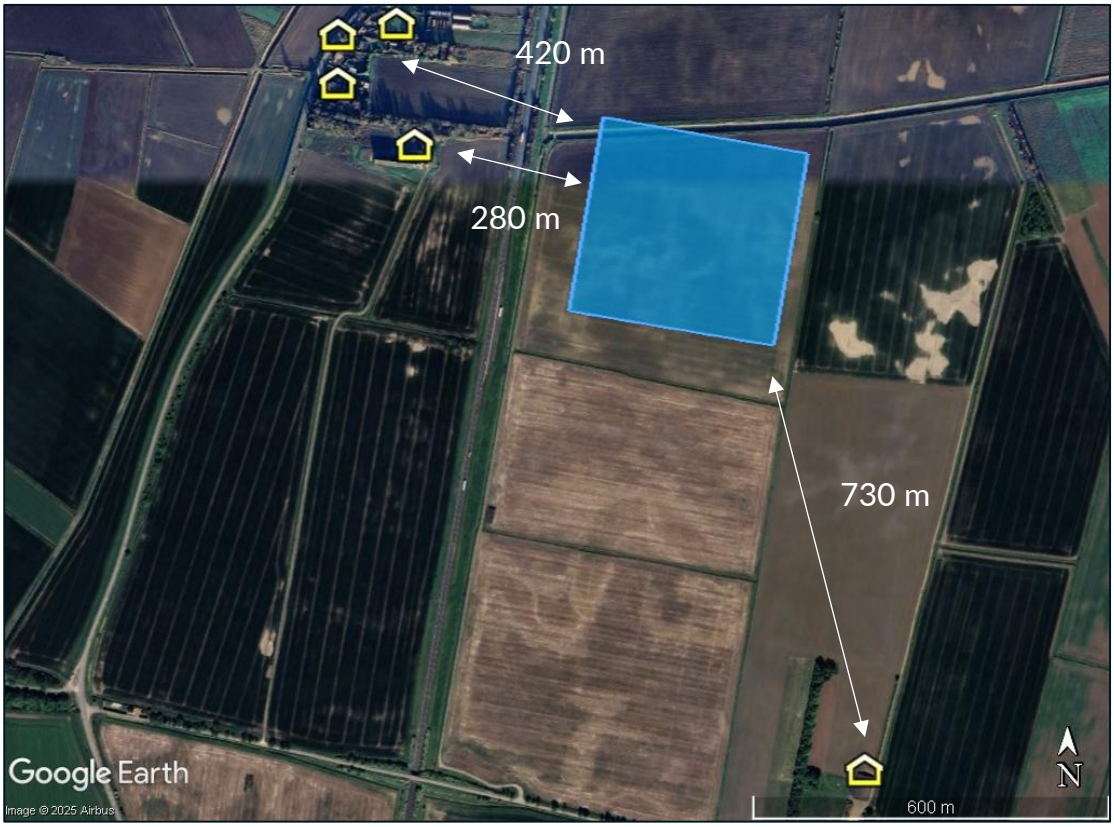


Figure 4-9: Approximate distance between the Substation and the nearest dwellings/workplace

Figure 4-10: Indicative distance between the Substation and the nearest dwellings/workplace

4.6.6. The approximate horizontal distance between the proposed On-Site 400kV Substation and BESS Compound site and the closest agricultural building (a workplace) is approximately 280m, while the approximate distance between the proposed 132kV substations and any dwelling/workplace is 350m.

4.6.7. Similar to PV inverters and transformer stations, the substations (ranging from 132kV to 400kV) will comprise equipment that is CE and/or UKCA marked. Such marking ensures compliance with standards designed to prevent electrical and electronic equipment from generating or being affected by unintended electric and magnetic disturbance.

4.6.8. Given that EMF levels decrease with distance, and that the proposed BESS site and substations are located more than 280m from any dwelling or workplace, significant EMFs are not predicted.

4.6.9. For users of roads, PRoW and adjacent agricultural fields, any EMF effects are expected to be minimal due to their transient exposure, as these are not

continually occupied; rather, they are moving receptors, as opposed to residential dwellings and workplaces in buildings.

4.7. Cumulative Effects

4.7.1. Combined effects with existing 11kV, 33kV and 132kV overhead lines within or near the Order Limits have been considered with respect to EMF exposure and human health implications.

4.7.2. When assessing the cumulative effects of EMFs, the worst case is based upon the addition of source A and source B; however, it is important to note that this is only true for magnetic fields that are on the same axis and moving in the same direction. When the EMFs are not in line, the sum of these is less than 'A+B'. For the purpose of this assessment, the worst case has been calculated, i.e. based upon 'A+B'.

4.7.3. The worst case scenario is expected to be encountered when the Scheme Grid Connection Route 400 kV overhead line and proposed Grimsby to Walpole and Weston Marsh to East Leicestershire 400kV overhead lines are located nearby. It is, however, proposed that there will be a minimum of 80m separation between the Scheme Grid Connection Route and Grimsby to Walpole and Weston Marsh to East Leicestershire schemes and therefore this is factored into the analysis below.

4.7.4. Based on the worst-case scenario whereby someone is stood directly under one of the 400kV powerlines and at 80m from the other 400kV overhead powerlines, the resultant typical magnetic field is 6.5 – 6.8µT, and the resultant typical electric field is 4.3kV/m^{-1}. The typical magnetic and electric fields therefore remain below the ICNIRP reference levels.

4.7.5. As discussed in Section 4.6, the substations and PV inverters produce smaller magnetic fields than those of the underground cables and overhead lines; thus, considering all sources of EMFs, the cumulative typical magnetic fields will remain within the exposure limits.

5. Conclusions

5.1. Assessment Conclusions – Inter-Array 132kV Underground Cables

5.1.1. Where 132kV underground cables are proposed, there is no need for any clearance distance to any locations where public exposure levels will be relevant. This is because the typical magnetic (9.62µT) and electric field (0 kV/m^{-1}) levels at one metre above ground are below the reference level from the public exposure limits in UK policy.

5.2. Assessment Conclusions – Inter-Array 132kV Overhead Lines

5.2.1. The typical magnetic field produced by the overhead lines is predicted to be 1µT. The magnetic field value is therefore below the reference level from the public exposure limits in the UK policy. The typical electric field produced by the overhead lines is predicted to be 0.6kV/m^{-1}. The electric field levels are therefore below the reference level from the public exposure limits in UK policy.

5.3. Assessment Conclusions – Grid Connection 400kV Overhead Lines

5.3.1. The typical magnetic field produced by the overhead lines is predicted to be 6.4 µT. The magnetic field value is therefore below the reference level from the public exposure limits in the UK policy. The typical electric field produced by the overhead lines is predicted to be 4.2kV/m^{-1}. The electric field levels are therefore below the reference level from the public exposure limits in UK policy.

5.3.2. When considering the worst-case cumulative fields when directly under a 400 kV overhead powerline and 80m from another 400kV overhead powerline, the magnetic and electric fields remain below the ICNIRP reference levels.

5.4. Assessment Conclusions – Grid Connection 400kV Underground Cable

5.4.1. Where 400kV underground cables are proposed, there is no requirement for any clearance distance to locations. This is because the typical magnetic field values (approximately 25µT directly above the cable route) remain below the reference levels set for public exposure under current UK policy.

5.5. Assessment Conclusions – Solar Stations, Substations and BESS

5.5.1. The electrical equipment associated with the solar stations, BESS, and substations should be 'CE' marked (Conformité Européene, or European Conformity marking), and/or 'UKCA' marked (UK Conformity Assessed). CE and UKCA markings indicate that a product has been assessed by the manufacturer and determined to meet the safety, health, and environmental protection requirements of the European Union and the United Kingdom, respectively. CE marking requirements were adopted and extended indefinitely in Great Britain until the UK left the EU in 2020. From 1 January 2021, the UKCA mark started to replace the CE mark for goods sold within Great Britain, and the CE mark continues to be required for goods sold in Northern Ireland. The CE marking would ensure that electrical and electronic equipment does not generate or is not unintentionally affected by electric and magnetic disturbance.

5.6. Overall Conclusions

5.6.1. The assessment confirms that typical EMFs from all overhead powerlines, underground cables, solar stations, substations, and BESS are all within the public exposure reference levels set out in UK policy. This remains true when considering the worst-case cumulative scenario of the Grimsby to Walpole and Weston Marsh to East Leicestershire schemes being located nearby the Scheme Grid Connection Route.