
FENWICK SOLAR FARM

**Fenwick Solar Farm
EN010152**

Framework Operational Environmental Management Plan

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Table of Contents

1.	Introduction.....	1
1.1	Introduction.....	1
1.2	The Applicant.....	2
1.3	The Site	2
2.	Operational Environmental Management	3
2.1	Introduction.....	3
2.2	Operation Activities.....	3
2.3	Operation Programme	4
2.4	Control of Light	4
2.5	Operational Traffic and Access	5
2.6	Panel Cleaning	6
2.7	Management of Vegetation Planting.....	7
2.8	Recovery, Recycling and Disposing of Waste.....	7
2.9	Water Supply	8
2.10	Surface Water Drainage	8
2.11	Grazing.....	8
2.12	Security	9
3.	Mitigation and Monitoring	10
3.1	Purpose	10
4.	Complementary Plans and Procedures	37
5.	Implementation and Operation	37
6.	Monitoring and Reporting	37
6.1	Monitoring.....	37
6.2	Records	38
7.	References	39
	Abbreviations	41
	Glossary of Frequently Used Terms	42

Tables

Table 3-1: Climate Change.....	11
Table 3-2: Cultural Heritage.....	13
Table 3-3: Ecology.....	14
Table 3-4: Water Environment.....	17
Table 3-5: Landscape and Visual Amenity.....	21
Table 3-6: Noise and Vibration	22
Table 3-7: Socio-Economics and Land-Use	24
Table 3-8: Transport and Access	26
Table 3-9: Soils and Agricultural Land	27
Table 3-10: Ground Conditions.....	30
Table 3-11: Glint and Glare.....	31
Table 3-12: Materials and Waste	32
Table 3-13: Major Accidents and Disasters	33
Table 3-14: Telecommunication, Television Reception and Utilities.....	34

1. Introduction

1.1 Introduction

- 1.1.1 This document provides the framework for the Operational Environmental Management Plan (OEMP) for Fenwick Solar Farm (hereafter referred to as 'the Scheme'). A detailed OEMP will be produced for the Scheme, prior to the date of final commissioning.
- 1.1.2 A Development Consent Order (DCO) would provide the necessary authorisations and consents for the Scheme which comprises the construction, operation and maintenance, and decommissioning of a solar photovoltaic (PV) electricity generating facility with a total capacity exceeding 50 megawatts (MW), and associated infrastructure including a Battery Energy Storage System Area (BESS Area) and an export and import connection to the national grid either at the Existing National Grid Thorpe Marsh Substation or at an existing overhead power line. Due to its total capacity exceeding 50 MW the Scheme is classified as a Nationally Significant Infrastructure Project (NSIP) under Sections 14(1)(a) and 15(2) of the Planning Act 2008 (Ref. 1) and therefore requires consent via a DCO. The decision whether to grant a DCO will be made by the Secretary of State for Energy Security and Net Zero (hereafter referred to as 'the Secretary of State') following the Examination and Recommendation by the Planning Inspectorate.
- 1.1.3 The aim of this Framework OEMP is to provide a clear and consistent approach to the control of operational and maintenance activities within the Site. This document does not address construction or decommissioning activities, which are subject to separate environmental management plans and procedures (**Framework Construction Environmental Management Plan (CEMP) [EN010152/APP/7.7]** and **Framework Decommissioning Environmental Management Plan (DEMP) [EN010152/APP/7.9]**).
- 1.1.4 An Environmental Impact Assessment (EIA) has been undertaken for the Scheme and an Environmental Statement (ES) has been prepared in accordance with the Infrastructure Planning (EIA) Regulations 2017 (EIA Regulations). In accordance with the requirements of the EIA Regulations, the ES contains the assessment of the likely significant effects on the environment that may be caused during the operation and maintenance phase of the Scheme and describes a range of 'industry standard' or good practice mitigation and operational management measures. This Framework OEMP outlines these operational mitigation measures and sets out the monitoring activities designed to ensure that such mitigation measures are carried out, and that they are effective.
- 1.1.5 The detailed OEMP will be produced in line with this Framework OEMP, which provides the structure and outline information, in accordance with Requirement 12 of the **draft DCO [EN010152/APP/3.1]**, before the Scheme becomes operational. This Framework OEMP is designed with the objective of ensuring compliance with the relevant environmental mitigation measures set out within the ES.

- 1.1.6 The key elements of this Framework OEMP are:
- a. An overview of the Site, Scheme and associated operation and maintenance activities and programme;
 - b. Prior assessment of environmental impacts (through the EIA);
 - c. Proposed design and other mitigation measures to prevent or reduce potential adverse environmental effects;
 - d. Monitoring and reporting of effectiveness of mitigation measures;
 - e. Corrective action procedure; and
 - f. Links to other complementary plans and procedures.
- 1.1.7 In summary, this Framework OEMP identifies how commitments made in the ES will be translated into actions and includes a process from implementing the actions through to the allocation of key roles and responsibilities.
- 1.1.8 The appointed contractor(s) will be responsible for working in accordance with the environmental controls documented in the Framework OEMP and for the preparation and implementation of the detailed OEMP.
- 1.1.9 This Framework OEMP has been designed with the objective of compliance with the relevant environmental legislation and mitigation measures set out within the ES.
- 1.1.10 Any additional licences, permits, or approvals that are required will be listed in the detailed OEMP, including any environmental information submitted in respect of them.

1.2 The Applicant

- 1.2.1 The Applicant (Fenwick Solar Project Limited) is a wholly owned subsidiary of BOOM Developments Limited who specialise in non-subsidised solar and battery storage projects. BOOM Developments Limited was founded in 2020, and the name BOOM is an acronym for Build Own Operate Maintain. This reflects the organisation's intentions to be involved in sustainable energy projects from day one right the way through to operation.
- 1.2.2 Further information on BOOM Developments Limited can be found in **Chapter 1: Introduction, ES Volume 1 [EN010152/APP/6.1]** and the **Funding Statement [EN010152/APP/4.2]**.
- 1.2.3 The DCO Application is submitted to the Planning Inspectorate, with the decision of whether to grant a DCO to be made by the Secretary of State for Department for Energy Security and Net Zero (hereafter referred to as the 'Secretary of State') pursuant to the Planning Act 2008 (Ref. 1).

1.3 The Site

- 1.3.1 The Order Limits are shown on **ES Volume II Figure 1-2: Site Boundary Plan [EN010152/APP/6.2]** and represent the maximum extent of land to be acquired or used for the construction, operation and maintenance, and decommissioning of the Scheme. This includes land required for temporary and permanent uses. The 'Site' is the collective term for all land within the Order limits.

- 1.3.2 The Order Limits comprise approximately 509 hectares (ha) of land, 407 ha of which is made up of the Solar PV Site. The Site is approximately centred on National Grid Reference (NGR) SE 604 161 and located entirely within City of Doncaster Council's administrative area. The surrounding landscape comprises largely agricultural fields and several small rural villages, including Fenwick, Moss, and Sykehouse, as well as the hamlet of Topham.
- 1.3.3 At the closest point, the Solar PV Site Boundary is located immediately adjacent to the east of the village of Fenwick and approximately 1 km west and 1 km north of the villages of Sykehouse and Moss respectively.
- 1.3.4 The Order Limits comprise the following elements (as shown on **ES Volume II Figure 1-3: Elements of the Site [EN010152/APP/6.2]**).
- a. The Site – the collective term for all land within the Order limits comprising the Solar PV Site, Grid Connection Corridor, and Existing National Grid Thorpe Marsh Substation;
 - b. Solar Photovoltaic (PV) Site – the total area covered by the ground-mounted Solar PV Panels, planting and mitigation areas, Field Stations, Battery Energy Storage System (BESS), On-Site Substation, and associated infrastructure;
 - c. Grid Connection Corridor – the area outside the Solar PV Site in which the 400 kilovolt (kV) and associated cables (the Grid Connection Cables) would be installed between the On-Site Substation to the Existing National Grid Thorpe Marsh Substation (approximately 6 km south of the Solar PV Site). The Grid Connection Corridor has an average width of 100m; and
 - d. Existing National Grid Thorpe Marsh Substation – the Existing Thorpe Marsh Substation (owned and operated by National Grid) where the 400 kV Grid Connection Cables would connect to the National Electricity Transmission System (NETS).
- 1.3.5 Further details of the Site are presented in **ES Volume I Chapter 2: The Scheme [EN010152/APP/6.1]** and the **Outline Design Parameters [EN010152/APP/7.4]**. The Outline Design Parameters set out the maximum parameters which will be met by the Applicant.

2. Operational Environmental Management

2.1 Introduction

- 2.1.1 This section sets out the general site arrangements for the operation and maintenance phase of the Scheme.

2.2 Operation Activities

- 2.2.1 During the operation and maintenance phase, activity within the Scheme will be minimal and will be restricted principally to vegetation management, equipment maintenance and servicing, replacement and renewal of any components that fail, and monitoring and inspection. It is anticipated that maintenance and servicing would include the inspection, removal, reconstruction, refurbishment or replacement of faulty or broken equipment to ensure the continued effective operation and maintenance of the Scheme.

Along the Grid Connection Corridor operational activity will consist of routine inspections (schedule to be determined) and any reactive maintenance such as where a cable has been damaged.

- 2.2.2 It is anticipated there would be up to two permanent staff on-site at any one time during the operation and maintenance phase, based at the Operations and Maintenance Hub. Additional staffing/visitors, such as maintenance workers and deliveries, would be ad hoc as needed. It is assumed this would equate to an average of four additional workers per month.
- 2.2.3 Any operational maintenance activities required to be undertaken on Horizontal Directional Drilling (HDD) cable sections within the Grid Connection Corridor are expected to be undertaken within existing joint bays installed during construction.
- 2.2.4 Additionally, the cleaning of Solar PV Panels is anticipated to be undertaken every two years (as a worst case), as explained in Section 2.5.9.

2.3 Operation Programme

- 2.3.1 The design life of the Scheme is 40 years with decommissioning to commence 40 years after final commissioning (currently anticipated to be 2030 to 2070).
- 2.3.2 During the operation and maintenance phase the solar farm will be monitored 24/7. Any maintenance activities will be programmed between 08:00 to 18:00 Monday to Friday, 08:00 to 14:00 on a Saturday and will not take place on a Sunday or Bank Holiday. Night-time working is not generally expected but may occur at times, such as for emergency repairs or maintenance, and if needing to clean the panels. For these purposes, "emergency" means a situation where, if the relevant action is not taken, there will be adverse health, safety, security or environmental consequences that in the reasonable opinion of the undertaker would outweigh the adverse effects to the public (whether individuals, classes or generally as the case may be) of taking that action.

2.4 Control of Light

- 2.4.1 The general principles of the lighting design in the operation and maintenance phase are set out below.
- 2.4.2 During operation and maintenance, the Solar PV Site will not require artificial lighting other than during temporary periods of maintenance/repair. All routine maintenance activities, except panel cleaning, will be scheduled for daylight hours as far as is practicable, and therefore it is anticipated that focussed task specific lighting should only be required in the event of emergency works/equipment failure requiring night-time working or panel cleaning operations.
- 2.4.3 As further described in Section 2.6, as a worst-case, it is estimated that the Solar PV Panels would be cleaned every two years. The panels would be cleaned at night when they are cool. The current preferred solution for cleaning operations would be lit by tractor mounted lighting which is akin to that used during night-time arable harvesting operations which are currently undertaken within the Order Limits.

- 2.4.4 As they are containerised units, the Field Station Units and BESS containers may also contain internal artificial lighting (to be manually activated when needed), but light spillage would be minimal (through doorway when open).
- 2.4.5 Task specific and fixed 'general' lighting will be used at the On-Site Substation, BESS Area and at the Operations and Maintenance Hub during the winter months (in early mornings and evenings only) to maintain safe working conditions. There will be internal lighting within the control buildings for the On-Site Substation and the BESS Area, and at the Operations and Maintenance Hub. Light spillage from these would be minimal (through open doorway or windows only). Outside of core working hours, Passive Infra-Red (PIR) controlled lights (motion sensors) would be used.
- 2.4.6 Therefore, during the operation and maintenance phase, no part of the Scheme will be continuously lit. The general design principles for operational lighting are set out below (see also the **Outline Design Principles Statement [EN010152/APP/7.4]**).
- 2.4.7 Lighting will be directional with care to minimise potential for light spillage beyond the Order Limits particularly towards houses, live traffic, and habitats, and will be designed with reference to the Institute of Lighting Professionals (ILP) Guidance Notes (in particular GN-8/23: Bats and Artificial Lighting at Night (Ref. 2) which was produced in collaboration with the Bat Conservation Trust (BCT), and GN-1: Reduction of Obtrusive Light (Ref. 3) in so far as it is reasonably practicable.
- 2.4.8 This includes the implementation of measures such as:
- Lights will be of the minimum brightness and/or power rating capable of performing the desired function;
 - Light fittings will be used that reduce the amount of light emitted above the horizontal (reduce upward lighting);
 - Light fittings will be positioned correctly, inward facing and directed downwards;
 - Direction of lights will seek to avoid spillage onto neighbouring properties, habitats, highway or waterway; and
 - Passive Infra-Red (PIR) controlled lights (motion sensors) will be used except where temporary focussed task specific lighting is required.

2.5 Operational Traffic and Access

- 2.5.1 Heavy Goods Vehicle (HGV) movements are anticipated to be low across the 40-year operational period. Limited use of HGVs will be required for the replacement of batteries, inverters and transformers associated with the Field Stations and the BESS. It has been assumed that during the replacement activity up to five pieces of equipment will be replaced per day (equating to 10 two-way HGV movements) over a period of several months, every ten years during operation.
- 2.5.2 Access to the Solar PV Site for HGVs will be solely from Access 1 off Moss Road, which is noted as access 6/14 on Sheet 6 of the **Streets, Rights of Way and Access Plans [APP-215]**. The details of Access 1 are presented in the Appendix A of the **Framework Construction Traffic Management Plan [APP-251, APP-252]**.

- 2.5.3 Abnormal Indivisible Loads (AIL) movements during the operation and maintenance phase are not anticipated due to the delivery of spare transformer phases to the On-Site Substation during the construction phase. If AILs are needed during the operational period, they will be in accordance with the findings of the routing review for large vehicles which is discussed further in the **Framework Construction Traffic Management Plan [EN010152/APP/7.11]**).
- 2.5.4 A small number of private vehicles for up to two permanent staff and ad hoc maintenance workers and visitors will also use the local road network along with light goods maintenance and delivery vehicles when required.
- 2.5.5 It is anticipated that any components which are removed (replaced), other than larger equipment such as batteries and inverters described above, would be transported to the Scheme's storage facilities in the existing barn in Field NW08 (by transit van or similar LGV). Once a sufficient volume of waste has been accumulated to make a 'load' for transport offsite, it is anticipated that these movements would also be undertaken by LGV (not by HGV).
- 2.5.6 Accesses into the Site installed during the construction phase (either new accesses or modified/extended existing accesses) will remain in place during the operation and maintenance phase. Main operational access to the Solar PV Site will be via Lawn Lane, while the access to the BESS Area and the On-Site Substation will be from Moss Road. Emergency access to the BESS Area and the On-Site Substation will be provided via Fenwick Common Lane / Haggs Lane and from Moss Road; at the Fenwick Common Lane / Haggs Lane access point emergency vehicles will be able to enter the Solar PV Site however all egress would be via Moss Road. Access to the Solar PV Site off West Lane will be for emergency use only. **ES Volume II Figure 2-3: Indicative Site Layout Plan [EN010152/APP/6.2]** illustrates the existing and proposed accesses.
- 2.5.7 Operational work may include maintenance of access to the Solar PV Site, ensuring safe and reliable entry for personnel and equipment. Potential activities could involve pothole repair and vegetation control.
- 2.5.8 Operational and maintenance staff will be directed to park within the Solar PV Site to limit impact on parking available within the local road network
- 2.5.9 Further details on traffic and transport are presented in **Table 3-8: Transport and Access**.

2.6 Panel Cleaning

- 2.6.1 The panel cleaning requirements for the Scheme can only be accurately determined once operational; therefore, to present a worst-case, a two-year cleaning cycle is assumed.
- 2.6.2 Panel cleaning would be achieved using a tractor mounted cleaning system with a rotating 'car-wash' type brush. It is anticipated that water would either come from an existing water supply of a nearby farm or be brought to Site in 1 m³ ((one tonne/1,000 litres (l)) intermediate bulk containers (IBC). Individual IBCs would be mounted on the rear of the tractor to provide water supply during cleaning.

- 2.6.3 Panels would be cleaned at night when they are cool, as applying cold water to warm panels can lead to thermal shock and the risk of micro-cracks to the panel surface. Cleaning operations would be lit by tractor mounted lighting which is akin to that used during night-time arable harvesting operations currently undertaken within parts of the Solar PV Site.
- 2.6.4 As the use of cleaning products (chemicals) can damage panels and void manufacturer's warranties, only water would be used with no cleaning products applied.
- 2.6.5 Dry-cleaning would not be employed as the action of the dry brush and any dust present on the panel surface would likely result in the formation of micro-scratches. Such scratches would likely attract/harbour more dirt on the panel surface decreasing efficiency and potentially voiding manufacturer's warranties.

2.7 Management of Vegetation Planting

- 2.7.1 A Framework Landscape and Ecological Management Plan (LEMP) [EN010152/APP/7.14] has been prepared and submitted as part of the DCO Application. The Framework LEMP provides a framework for delivering the landscape strategy and the successful establishment and future management of proposed landscape works and habitats associated with the Scheme. It sets out the short and long-term measures and practices that will be implemented to establish, monitor, and manage landscape and ecology mitigation and enhancement (biodiversity net gain) measures embedded in the design.
- 2.7.2 The Framework LEMP sets out the measures proposed:
 - a. To mitigate the effects of the Scheme on landscape, biodiversity, and heritage features;
 - b. To enhance the biodiversity, landscape, and green infrastructure value of the Order limits; and
 - c. To secure compliance with relevant national and local planning policies, including biodiversity net gain.
- 2.7.3 A detailed LEMP will be prepared in accordance with the Framework LEMP and will be submitted to and approved by the relevant local planning authority prior to construction, as secured through a requirement in the DCO. This will include provisions in respect of establishment management and on-going maintenance of the landscape and ecology.

2.8 Recovery, Recycling and Disposing of Waste

- 2.8.1 The contractor will separate the main waste streams on-site, prior to transport to an approved, licensed third party Waste Management Facility for recovery, recycling or disposal.
- 2.8.2 Waste Duty of Care will be followed for all waste generated on Site. All waste to be removed from the Order Limits will be undertaken by fully licensed waste carriers and taken to suitably licensed Waste Management Facilities and managed in line with the requirements of the Hazardous Waste Regulations (2005) (Ref. 4) and the Waste (England and Wales) Regulations

(2011) (Ref. 5). The Scheme will apply the waste hierarchy, in priority order; prevention, preparation for reuse, recycled, other recovery and disposal.

2.9 Water Supply

- 2.9.1 During operation and maintenance self-contained portable welfare units which store foul/wastewater for collection/emptying by specialist licenced contractors will be deployed on an ad hoc basis (e.g., if required by maintenance crews) at the further reaching sites where the use of the facilities at the Operations and Maintenance Hub is not feasible.
- 2.9.2 It is anticipated that the water supply for the Operations and Maintenance Hub will come from the private water supply of mains water. Foul water and grey water would be treated off-site. Foul drainage from any permanent welfare facilities would be directed to an on-site cesspit for treatment prior to discharge. The cesspit (i.e. sealed tank) would be emptied by a suitable tanker as and when required. It is not proposed to have a permanent discharge to sewer, watercourse or to ground via, an infiltration field. Water for panel cleaning will be brought to Site in 1 m³ (intermediate bulk containers (IBC)).
- 2.9.3 Fire water will be stored at the volume outlined in **ES Volume I Chapter 9: Water Environment [EN010152/APP/6.1]** to ensure there is sufficient water for firefighting purposes. More details on fire water supply and storage is provided within the **Framework Battery Safety Management Plan [EN010152/APP/7.16]**.

2.10 Surface Water Drainage

- 2.10.1 **ES Volume III Appendix 9-4: Framework Drainage Strategy [EN010152/APP/6.3]** covers the BESS Area and the On-Site Substation. The detailed operational drainage design would be carried out pre-construction with the objective of ensuring that drainage of the land to the present level is maintained. It would follow either the design of a new drainage system taking into account the proposed new infrastructure (access tracks, cable trenches and structure foundations) to be constructed or, if during the construction of any of the infrastructure there is any interruption to existing schemes of land drainage, new sections of drainage would be constructed.
- 2.10.2 Management of fire water is further described in Section 9.4 of **ES Volume I Chapter 9: Water Environment [EN010152/APP/6.1]** and **ES Volume III Appendix 9-4: Framework Drainage Strategy [EN010152/APP/6.3]**.

2.11 Grazing

- 2.11.1 For the purposes of assessment and reporting of effects, it is assumed that there will be no grazing at the Solar PV Site during the operation and maintenance phase.
- 2.11.2 However, should consent be granted, grazing by sheep may be explored, noting that there are no known landowner restrictive covenants or other reasons that would prevent such use. **ES Volume III Appendix 2-1: Grazing Feasibility Report [EN010152/APP/6.3]** confirms that “if managed correctly, by providing good fencing and water supplies and good sheep husbandry, then there is no reason why the land under the panels cannot successfully

be grazed by sheep, as is common practice on other operational solar farms both within the UK and internationally.”

- 2.11.3 Should grazing be implemented at the Solar PV Site, stock density and seasonality of grazing will be such as to maintain the post-development grassland status as presented within the **Biodiversity Net Gain Assessment [EN010152/APP/7.11]**.

2.12 Security

- 2.12.1 The Site will receive several security risk management threat assessments during its development, construction, operation and maintenance, and ultimately decommissioning phases. These security risk management threat assessments are conducted by suitable qualified and experienced persons (SQEP) and will determine security risks.
- 2.12.2 The Applicant recognises, and embraces, the symbiotic relationship between safety and security. The security arrangements to be present at the Site will therefore contribute to the overall safety of all who will, or may, enter the Site. The security arrangements will be SQEP reviewed at identified epochs commensurate to the Security Risk rating and will further assess any changes in the Security Risk Management Threat Assessment.
- 2.12.3 The Solar PV Site perimeter fence will enclose the operational areas of the solar farm. The fence will be a stock proof mesh-type security fence with wooden posts up to 2.2 m in height.
- 2.12.4 Post mounted internal facing closed circuit television (CCTV) systems will be installed around the perimeter of the operational areas of the Solar PV Site. The wooden mounting posts will be directly driven into the ground using a standard post driver. There will be no excavation of foundations or ‘concreting in’ of posts. The power supply and communication (fibre optic) cables to the cameras will be underground.
- 2.12.5 The perimeter CCTV system will be mounted on wooden posts approximately 2.5 m high. These CCTV cameras will have fixed, inward-facing viewsheds and will be aligned to capture only the Scheme fence and the area inside the fence, thereby not capturing publicly accessible areas. The poles will be positioned at every change in direction to the fence, and the anticipated spacing is every 50 m along straight sections. The CCTV will use thermal imaging and Infrared (IR) lighting to provide night vision functionality meaning that no visible lighting will be needed for security.
- 2.12.6 The On-Site Substation will be securely fenced with galvanised palisade security fencing, likely green in colour. The fencing would be at a maximum height of 2.5 m with mandatory warning signage. There would be a perimeter fence around the On-Site Substation compound, with a secure gated access point off Lawn Lane.
- 2.12.7 Centrally located CCTV mounted up to 5.0 m will be installed within the On-Site Substation covering a 360° view of the On-Site Substation. These CCTV cameras will have fixed, inward-facing viewsheds and will be aligned to capture only the Scheme fence and the area inside the fence, thereby not capturing publicly accessible areas. The CCTV will use thermal imaging and IR lighting to provide night vision functionality meaning that no visible lighting will be needed for security.

- 2.12.8 The Operations and Maintenance Hub will be manned throughout the day, night-time security will be provided by CCTV (as above).

3. Mitigation and Monitoring

3.1 Purpose

- 3.1.1 This section of the Framework OEMP sets out the mitigation measures to be included as a minimum in the detailed OEMP. It also sets out monitoring requirements and the responsible party identified for each mitigation measure or monitoring requirement. This section will be updated and expanded upon as part of the preparation of the detailed OEMP.

Table 3-1: Climate Change

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Greenhouse gas emissions from the operational maintenance activities required during operation of Scheme.	a. Use of motion detection security lighting and thermal /IR CCTV system to avoid permanent lighting and reduce energy demand of the Scheme (see Sections 2.4 and 2.12); b. Establish, monitor, and manage landscape and ecology mitigation and enhancement (BNG) measures embedded in the design, secured through the Framework Landscape and Ecological Management Plan (LEMP) [EN010152/APP/7.14], which has been submitted as part of the DCO Application; c. Regular maintenance of the Scheme will be conducted to optimise the efficiency of the Scheme infrastructure; d. Operating the Scheme in such a way as to minimise the creation of waste and maximise the use of alternative materials with lower embodied carbon, such as locally sourced products and materials with higher recycled content; and e. Switching off vehicles and plant when not in use and ensuring vehicles conform to current EU emissions standards.	N/A	The overall responsibility will be with the Applicant. Specific responsibilities will be confirmed in the detailed OEMP.
Climate Change Risks and extreme weather events.	In addition, adaptation measures to reduce the effect of projected temperature increases on electrical equipment over the course of the Scheme's design life have been taken into account. PV inverters will have a cooling system installed to control the temperature and allow the inverters to operate efficiently in warmer conditions. The PV modules and		

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	transformers have a wide range of acceptable operation temperatures, and it has been determined that increasing temperatures will not adversely affect their operation. Consideration will also be given to the UKCP18 climate change projections outlined in ES Volume I Chapter 6: Climate Change [EN010152/APP/6.1] Section 6.5, and the resilience of the Scheme's infrastructure to these, through the detailed design process.		

Table 3-2: Cultural Heritage

Potential Impact	Mitigation/Enhancement Measure	Monitoring Requirements	Responsibility
Impacts on the setting of heritage assets during operation and maintenance.	Physical impacts to known heritage assets within the Order Limits have been avoided by the Scheme design, where practicable. Fields immediately surrounding the listed buildings at Fenwick Hall Farm and Lily Hall, and the Scheduled Monument Fenwick Hall moated site, have been excluded from the Scheme. Heritage Buffer Areas have been applied to the field adjacent to the Scheduled Monument Fenwick Hall moated site and areas of archaeological interest across the Solar PV Site identified from the geophysical survey and trial trenching. The Scheme has been designed to avoid or minimise potential changes to the setting of designated heritage assets through the retention and enhancement of existing hedgerows. The Contractor will incorporate into the detailed OEMP the measures for managing cultural heritage during the operation and maintenance phase, as set out in the Archaeological Mitigation Strategy (AMS). These measures will include, but not be limited to: a. Methodology for how buffer zones around heritage assets are to be maintained during the operational phase to achieve successful preservation of archaeological remains; and b. Inclusion of heritage management measures in site inductions and Toolbox Talks.	None	The overall responsibility will be with the Contractor. Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-3: Ecology

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Disturbance to protected and notable species and associated habitat from artificial lighting.	During the operation and maintenance phase, the Solar PV Site will not require artificial lighting other than during temporary periods of maintenance/repair. All routine maintenance activities, except panel cleaning, will be scheduled for daylight hours as far as is practicable, and therefore it is anticipated that focussed task specific lighting should only be required in the event of emergency works/equipment failure requiring night-time working or panel cleaning operations (Section 2.4). Section 2.4 details the control of light during the operation and maintenance phase and Section 2.5.9 discusses lighting during panel cleaning. Where lighting is required during operation and maintenance, it will conform to good practice guidelines with respect to minimising light spill into adjacent habitats and prevent disturbance to bats and other species.	N/A	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.
Impacts on protected species during operation and maintenance phase.	Where maintenance of equipment and vegetation is required throughout the operation and maintenance phase, Reasonable Avoidance Measures (RAMs), including appropriate buffers (up to 30m) around any identified badger setts, or retained trees with bat roost suitability (buffer of 15m) throughout the Order Limits will be implemented. Any required management of vegetation within the Scheme will be undertaken in accordance with legislative requirements associated with breeding birds e.g. undertaken outside of the bird nesting season (typically March to August inclusive) and with reptiles and amphibians.	N/A	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	<u>Should any unexpected maintenance be required on trees potentially supporting roosting bats, pre-commencement checks by an appropriately licensed ecologist will be required.</u>		
Impacts on aquatic habitats/species and water-dependent nature conservation sites	The Scheme's Framework Drainage Strategy (Framework Drainage Strategy Appendix 9-4, ES Volume 2 [EN010152/APP/6.2]) includes measures to manage surface water runoff from the BESS Area and On-Site Substation during operation and maintenance and will reduce the likelihood and severity of potential pollution incidents and flooding affecting watercourses and the local ditch network to reduce or eliminate adverse effects for aquatic and riparian species and habitats. A detailed Drainage Strategy will be prepared by the contractor post-consent (as secured by DCO Requirement through the Framework Drainage Strategy). Detailed information is provided in Table 3-4 regarding mitigation measures to avoid adverse impacts to aquatic habitats and water-dependent nature conservation sites.	Regular recording of compliance in a logbook. The detailed OEMP will detail the frequency. The detailed OEMP will include a regular schedule for visual inspection of the attenuation ponds, channels, culverts, panels and all other equipment.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.
Reduction in habitat connectivity	The Solar PV Site perimeter fence design (stock proof mesh-type security fence with wooden posts) will include gaps at the base to allow mammals that may use retained habitats, including, badger, brown hare and hedgehog, to pass underneath at strategic locations, thereby retaining connectivity across the Scheme. The security perimeter fence will also be set back to the agreed buffer distances from ecological receptors (watercourses, trees, hedgerows etc).	Check by Environmental Manager during detailed design, procurement, and installation.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.
Reduction in habitat quality	Habitats within the Order Limits will be managed to achieve Biodiversity Net Gain (BNG) targets (as detailed in the BNG	Monitoring requirements, frequency and	Overall responsibility lies with the Applicant (who

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	Assessment Report [EN010152/APP/7.11]) and to provide suitable habitat for a range of protected and notable species during the operation and maintenance phase of the Scheme. Habitat management principles are outlined in the Framework LEMP [EN010152/APP/7.14] and will be confirmed in the detailed LEMP. This includes management and monitoring of artificial bird and bat habitat boxes and any wetland features created for wading birds. Grazing by sheep is the Applicant's preferred option for the management of the grassland created within the solar farm. Should grazing not be achievable in some or all areas of the Solar PV Site, grassland will instead be managed by mowing/strimming.	responsibility is outlined in the Framework LEMP [EN010152/APP/7.14] and will be confirmed in the detailed LEMP. A Habitat Management and Monitoring Plan (HMMP) will be incorporated into the detailed LEMP prior to the operation and maintenance phase of the Scheme commencingproduced before the scheme becomes operational, which will detail monitoring required. Monitoring surveys will assess the habitat quality and condition present and detail any remedial measures required.	will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-4: Water Environment

Potential Impact	Mitigation Measure	Monitoring	Responsibility
The following impacts may occur without adequate mitigation: a. Impacts on water quality in watercourses and groundwater from run-off and the potential for accidental spillages from new permanent hardstanding and maintenance activities and refuelling of the backup generator; b. Potential impacts on hydrology as a result of the Scheme. This may also have a subsequent effect on aquatic habitats and water-dependent nature	Watercourse Buffers Watercourse buffers of 10 m (measured from water's edge) from solar PV infrastructure (except in the case of open-cut cable installation) will be implemented. Flood Risk Mitigation Requirements Where panels are located within Flood Zone 3, the panels will be raised to ensure a 300 mm freeboard above the modelled design flood event (1% Annual Exceedance Probability (AEP) plus 38% climate change) in that location. Where Solar PV Panels are located within the Credible Maximum Scenario flood extent, these will be raised 400 mm above the flood level associated with this event. Individual Solar PV Panels will be held above the ground surface on Solar PV Mounting Structures (see ES Volume I Chapter 2: The Scheme [EN010152/APP/6.1]). This will avoid sealing the ground with impermeable surfaces. As a result, it is assumed that the impermeable area will remain largely consistent with its pre-development state. The areas surrounding the panels will be planted with native grassland to intercept and absorb rainfall running off the panels, preventing it from concentrating and potentially forming channels in the ground. However, runoff from the Solar PV Panels and the small impermeable areas associated with the proposed Field Stations, compounds for the On-Site Substation and BESS Area, and concrete block mounts for Solar PV Panels in archaeological mitigation areas may alter the existing routing of runoff in localised areas. To prevent ponding occurring in	Regular recording of compliance in a logbook. The OEMP(s) will detail the frequency. The detailed OEMP(s) will include a regular schedule for visual inspection of the panels and all other equipment. No water quality monitoring is required during the operation and maintenance phase.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Potential Impact	Mitigation Measure	Monitoring	Responsibility
conservation sites;	these areas a series of boundary and routing swales will be constructed to convey surface water runoff away from the Solar PV Panels and towards receiving watercourses.		
c. Potential impacts on the rate and volumes of surface water runoff entering local watercourses and increasing the risk of flooding;	The Operator will be required to develop an Emergency Response Plan as part of the detailed OEMP which will include details of the response to an impending flood, such as an evacuation plan. The On-Site Substation and BESS Area are shown to be at risk of tidal/fluviat flooding during a breach scenario. As the most vulnerable aspects of the development, these features will be bunded to provide protection during the unlikely event of a breach of the flood defences. The height of this bund will be 1.1 m as this is 300 mm above the maximum flood depths during the River Don breach scenario where depths reach up to 0.8 m at the BESS. These vulnerable assets are not located within the design flood event when no breach occurs.		
d. The current arable fields are treated with fertiliser and pesticides. During the life of the Scheme the use of such chemicals will be ceased which will lead to beneficial impacts on the water environment; and	To mitigate against rising groundwater levels in the groundwater, the cable and cable ducting will be designed to prevent water ingress. The swales will be sized to accommodate the attenuation required for the 1% AEP + 40% climate change rainfall event. Due to current understanding of ground conditions within the Solar PV Site, it is unlikely that runoff will be able to discharge via infiltration. Therefore, surface water from the swales is proposed to be discharged to local watercourses. The discharge to these watercourses will be maintained at existing greenfield runoff rates by restricting rates using a flow control. The flow control will use a restriction on the outlet of the swale		
e. Potential impacts on groundwater resources and local water supplies.			

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	which will hold water back within the swale and release it at a controlled rate. Management of Spillage Risk The measures outlined below will be implemented to manage the risk of accidental spillages within the Order Limits and potential conveyance to nearby water features via surface runoff or land drains. The following measures will be adopted during operation and maintenance: - Fuel will be stored and used in accordance with the Control of Substances Hazardous to Health Regulations 2002, and the Control of Pollution (Oil Storage) (England) Regulations 2001 (Ref. 8; Ref. 9); - Fuel and other potentially polluting chemicals will either be in self-bunded leak proof containers or stored in a secure impermeable and bunded area (minimum capacity of 110% of the capacity of the containers, which includes 10% more capacity than is needed); and - The Site will be secure to prevent any vandalism that could lead to a pollution incident. Surface Water Drainage Strategy A Framework Drainage Strategy, ES Volume III Appendix 9-4 [EN010152/APP/6.3], has been developed and includes measures to manage surface water runoff from the BESS Area and On-Site Substation during operation and maintenance and will reduce the likelihood and severity of potential pollution incidents and flooding affecting watercourses and the local ditch network. The detailed operational drainage design would		

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	be carried out pre-construction with the objective of ensuring that drainage of the land to the present level is maintained. Regular maintenance and monitoring, in accordance with industry good practice, e.g. CIRIA SuDS Manual, is paramount for ensuring effective water treatment benefits of the proposed SuDS drain. A bespoke maintenance plan will be developed during detailed design. It is proposed that monthly inspections would be undertaken to remove any litter from the surface of the gravel-filled detention basins and ensure that this system is not blocked or damaged. Geotextiles will be replaced following manufacturer guidance and overlying filter material should be cleaned, as required and at a frequency determine during detailed design. If there is any evidence of excessive erosion or sedimentation associated with new structures further actions will be considered to remedy that impact in as sustainable a way as possible. Panel Cleaning This is described in Section 2.6 Panel Cleaning. Herbicides Should any herbicide or other spray chemical be needed in small volumes, a method statement, operating procedure or similar will be prepared prior to the work commencing. This will include measures to protect ground and surface water, including working in dry weather and not in high winds, and maintaining appropriate buffers from watercourses. Application of chemicals would only be carried out by suitably competent personnel using products approved for UK use with adherence to manufacturer's instructions.		

Table 3-5: Landscape and Visual Amenity

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Lighting on residential, Public Right of Way (PRoW) and road receptors	The control of lighting in the operation and maintenance phase of the development is presented in Section 2.4 and will prevent nuisance light to residential, road and PRoW receptors.	Daily checks of operational areas will note any instances where lighting requires adjustment.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.
Potential to impact on residential and road receptors	New and existing hedgerows will be managed and maintained to a range of heights between 2.5 m and 3.5 m.	Monitoring of planting is provided in Framework LEMP [EN010152/APP/7.14]	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-6: Noise and Vibration

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Noise and vibration from operational equipment.	A commitment that noise at sensitive receptors will be no higher than the levels presented in Section 11.10 of ES Volume I Chapter 11: Noise and Vibration [EN010152/APP/6.1]. This will be achieved by the implementation of the embedded mitigation measures summarised as follows: - Plant selection; and - Design layout to minimise noise at receptors, including locating the Field Stations and BESS Area in areas away from large concentrations of receptors, such that noise emissions are less impactful. A maximum of 28 Field Stations, incorporating 99 Field Station Units, from the 28 that have been modelled based on the illustrative layout. Should there be a requirement for Field Stations to be moved or move noise-generating infrastructure closer to sensitive receptors, the Applicant commits that noise at sensitive receptors will be no higher than the levels presented in Table 11-7 of ES Volume I Chapter 11: Noise and Vibration [EN010152/APP/6.1]. Plant that will be used for the Scheme has not yet been finalised. Where practicable quieter plant than that considered in EIA will be incorporated into the final design. Quieter plant would be the most effective way of controlling noise emissions.	Noise monitoring will be undertaken during commissioning. The OEMP(s) will detail the frequency.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	Field Stations will be placed as far as practicable from sensitive receptors where the highest levels of noise were predicted. This will be a minimum distance of 250 m. Low frequency noise can be very difficult to predict with a high level of certainty and similarly hard to identify and resolve if present. This is because it can be generated by the unexpected interactions between system components and can be amplified by the geometry of the Site and receptor buildings. The issue of low frequency noise will be considered during the detailed design post consent for the On-Site Substation and eliminated through design, or appropriately mitigated (isolation and attenuation measures). Plant will be inspected regularly and any faults that result in increased levels of noise emissions will be logged and repaired as soon as practicable.		

Table 3-7: Socio-Economics and Land-Use

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Disruption to users of Public Rights of Way	A Framework Public Rights of Way Management Plan (PRow MP) [EN010152/APP/7.13] is presented with the DCO Application and considers the management of PRow during operation and maintenance. This will be updated, and measures incorporated into the detailed OEMP. The Framework PRow MP states: - The existing PRow which pass through or run adjacent to the Order limits are expected to be unaffected during the Scheme operation, aside from Sykehouse 29, Moss 6 and Fenwick 14 footpaths that will be permanently diverted. The operational phase of the Scheme will include the following mitigation measures: - Maintaining access to all existing PRow within the Order limits; and - Controlling areas where the internal maintenance route crosses any existing PRow (such as by providing gates), permitting only operational traffic to utilise these internal routes within the Solar PV Site. Operational traffic would give-way to other users when utilising the crossing points. Visibility will be maximised between operational vehicles and other users, with warning signage provided if required. A minimum width has been incorporated into the Scheme design for PRow within or directly adjacent to the Solar PV Site. The PRow will also be buffered from the perimeter fencing, with fencing being installed a minimum distance of 20 m either side of the centre of the PRow where solar infrastructure lies to both sides (creating a 40 m wide corridor	To be confirmed in the detailed OEMP.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	between the fence lines), or 15 m if solar infrastructure is to one side only. There will be a further 5 m from the perimeter fence to the Solar PV Panels. This will avoid the perception of being channelled into narrow passages between Solar PV Panels.		
Disruption to local residents, businesses and community facilities	Primary mitigation measures are embedded within the Scheme, as set out in the respective chapters, to reduce adverse operational effects (such as noise, transport, and landscape and visual) which in turn will mitigate the effects on the local community and existing facilities from a socio-economic and land use perspective. a. Measures to mitigate the effects of visual impacts from operational are outlined in Table 3-5; b. Measures to mitigate the effects of operational noise are outlined in Table 3-6; and c. Measures to mitigate the effects of operational traffic are outlined in Table 3-8.	N/A	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-8: Transport and Access

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Vehicle movements during operation and maintenance	See also Section 2.5. During the operation and maintenance phase, the following embedded design mitigation measures are proposed: - Operational staff will be directed to take the most direct route to the Site using 'higher' order roads, such as A and B classified roads or the Strategic Road Network; - HGV movements are anticipated to be low across the 40-year operation and maintenance phase, but when required HGV movements will be restricted to certain times of day (between 09:00 and 17:00) and restricted to the SRN and other 'higher' order roads where applicable (M62, M18, M180, A19); - Ensuring operation and maintenance staff park within the Solar PV Site during operation and maintenance to limit impact on parking available within the local road network; - Providing sufficient protection/separation between existing PRow and the Scheme infrastructure (Solar PV Panels, BESS Area and the On-Site Substation) where necessary using perimeter fencing installed at a minimum distance of 20 m on either side of the centre of the PRow where solar infrastructure lies to both sides or 15 m if solar infrastructure is to one side only; and - Emergency access to the BESS Area and the On-Site Substation will be provided via Fenwick Common Lane / Haggs Lane and from Moss Road.	Not Required	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-9: Soils and Agricultural Land

Potential Impact	Mitigation/Enhancement Measure	Monitoring	Responsibility
The Scheme has the potential to impact soil resources in terms of disturbance and damage. The Scheme has the potential to result in a loss of soil resources, including related biosecurity effects. Lowering of Agricultural Land Classification (ALC) grade (reduction in land quality)	A Framework Soil Management Plan (SMP), [EN010152/APP/7.10] is presented with the DCO Application and considers the management of soils during operation and maintenance. This will be updated, and measures incorporated into the detailed SMP post consent. Soil movement is not expected, but where localised small scale maintenance operations require excavations, these works would be managed through adherence to the detailed SMP, with a Risk Assessment Method Statement (RAMS), Operating Procedure or similar which would include measures for the sustainable management of soil resources. The following main points (drawn from the Framework Soil Management Plan [EN010152/APP/7.10]) should be observed during all soil handling tasks: - No trafficking/driving of vehicles/plant or materials storage to occur outside designated areas; - No trafficking/driving of vehicles/plant on reinstated soil (topsoil or subsoil); - Only direct movement of soil from donor to receptor areas (no triple handling and/or ad hoc storage); - No soil handling to be carried out when the soil moisture content is above the lower plastic limit; - Soils should only be moved under the driest practicable conditions, and this must take account of prevailing weather conditions;	Maintenance works would be audited against the RAMS/ Operating Procedure	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Potential Impact	Mitigation/Enhancement Measure	Monitoring	Responsibility
	f. No mixing of topsoil with subsoil, or of soil with other materials; g. Soil only to be stored in designated soil storage areas; h. Plant and machinery only work when ground or soil surface conditions enable their maximum operating efficiency; i. All plant and machinery must always be maintained in a safe and efficient working condition; j. Daily records of operations undertaken, and site and soil conditions should be maintained; and k. Low ground pressure (LGP models) or tracked vehicles should be used where practicable. l. Soils (topsoil and subsoil) to be reinstated in sequence to recreate the soil profile. The specific mitigation measures would take account of soil type – drawing upon the available survey data for the Order Limits and the detailed SMP produced at the construction phase. The appropriate management of soil resources will maintain soil volumes and quality to prevent loss/lowering of ALC grade. The loss of soil resource may contribute to the spread of disease and pathogen transfer, due to the transfer of soil (and incorporated seed/spore bank) from infected to uninfected areas. The Biosecurity Plan prepared for the construction phase will be revised for the operation and maintenance phase, in advance of start of operation (secured through the OEMP).		

Potential Impact	Mitigation/Enhancement Measure	Monitoring	Responsibility
	UK Government's website advertising current occurrences and imposed restrictions with regards to animal and plant diseases should be checked both post-construction and at regular intervals throughout operation and maintenance. The Applicant will also subscribe to the Animal Disease Alert Subscription Service. All restrictions will be adhered to and may include additional biosecurity measures being implemented such as restricted movements within prevention zones and additional measures around the disinfection of plant and equipment (including boots and manual tools). Should grazing be undertaken it would be managed to ensure that potential negative impacts from over-grazing, or damage to soil structure do not occur. For example, the size of the flock would be suitable for the area being grazed, the flock would be rotated as required and moved out of areas if the land is too wet. These measures would be set out in the detailed OEMP if required.		

Table 3-10: Ground Conditions

Potential Impact	Mitigation/Enhancement Measure	Monitoring
Based on the environmental design and management measures for the operation and maintenance phase the risk to ground conditions is considered acceptable.		

Table 3-11: Glint and Glare

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Potential to impact on ground based receptors (residential, PRow, rail waterways and road).	New and existing hedgerows will be managed and maintained to a range of heights between 2.5 m and 3.5 m.	Monitoring of planting is provided in Framework LEMP [EN01015243/APP/7.14] .	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-12: Materials and Waste

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Impacts of waste to the surrounding environment. Potential to impact on sensitive receptors (humans, wildlife and controlled waters) if not stored and managed appropriately	During operation and maintenance, the Scheme will aim to prioritise waste prevention, followed by preparing for reuse, recycling and recovery and lastly disposal to landfill as per the waste hierarchy. Waste will be managed as per the recommendations in the Framework Site Waste Management Plan [EN010152/APP/7.10]. All management of waste will be in accordance with the relevant regulations and waste will be transported by licensed waste hauliers to waste management facilities which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them.	A register of waste loads leaving the Order Limits would be maintained to provide a suitable audit trail for compliance purposes and to facilitate monitoring and reporting of waste types, quantities and management methods.	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Table 3-13: Major Accidents and Disasters

Potential Impact	Mitigation Measure	Monitoring
A Framework Battery Safety Management Plan [EN010152/APP/7.16] has been produced and will be referred to during operation to safely reduce and manage the risk of fire during operation and maintenance. A full version will be produced prior to commissioning. All works will be undertaken in accordance with relevant Health and Safety legislation and guidance. Details of fire, police, emergency services and hospitals will be publicised and included in the site induction. Further risks of major accidents and disasters are covered in the following tables: Table 3-4 Flood Risk and Water Environment, and Table 3-8 Transport and Access.		

Table 3-14: Telecommunication, Television Reception and Utilities

Potential Impact	Mitigation Measure	Monitoring	Responsibility
Potential to affect existing above and below ground utility infrastructure	Measures in relation to safe working beneath overhead lines will be in place at all stages of the Scheme, for example measures set out in National Grid's technical guidance note 287 (Third-party guidance for working near National Grid Electricity Transmission equipment) such as ensuring adequate clearances are in place when plant and equipment is being moved beneath the overhead lines (Ref. 10). Due to the nature of the scheme no impacts to below ground utility infrastructure are expected during operation and maintenance however, should maintenance works require excavations, measures in relation to safe working near buried utilities, particularly gas pipelines, will be in place. For example mitigation set out in National Grid and Northern Gas Networks guidance documents for third parties working in the vicinity of high pressure gas pipelines and associated installations (Ref. 11; Ref. 12). Measures outlined in these documents are likely to include: Pre-Work Consultation and Planning - Contacting National Grid or Northern Gas Networks early in the project planning stage to discuss the proximity to pipelines and associated risks; - Use of pipeline location services (such as "Dial Before You Dig") to accurately locate high-pressure pipelines before any work begins; and - Implementation of Site-Specific Risk Assessments considering the presence of pipelines and installations, to develop appropriate safety controls. Establish Safe Working Practices	No monitoring required	Overall responsibility lies with the Applicant (who will be the operator of the Scheme). Specific responsibilities will be confirmed in the detailed OEMP.

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	a. Adhere to minimum safe working distances from pipelines, which may vary depending on the type of work and the equipment being used; b. Hand digging is required when working directly over or near a pipeline to avoid accidental damage; c. Restrictions apply to the use of powered mechanical tools. If allowed, these tools must not be used directly above the pipeline and should be operated at a safe distance. d. Protective measures, such as using fencing or physical barriers, may be required to prevent accidental damage from construction equipment. Permit and Supervision Requirements a. In some cases, a permit-to-work system will be required, meaning no work can start until the appropriate permits have been obtained. b. National Grid or Northern Gas Networks may require on-site supervision by their representatives to monitor work and ensure safety measures are followed. Pipeline Integrity and Monitoring a. Regular monitoring during construction activity to ensure that pipelines remain stable and undisturbed; Avoiding Heavy Loads Over Pipelines; and Techniques such as sleeving, padding, or additional protective layers may be employed where necessary to protect the pipeline from physical impacts. Emergency Procedures		

Potential Impact	Mitigation Measure	Monitoring	Responsibility
	a. Production of an Emergency Response Plan (ERP) including details on evacuation plans and immediate reporting of any damage or gas leaks; and If a pipeline is struck or suspected of being damaged, all work must stop immediately, and the incident must be reported to the relevant authorities. Post-Work Inspection a. After work is completed, an inspection may be required to verify that the pipeline and surrounding area remain safe and undamaged; and Accurate records of the work carried out near pipelines should be kept for future reference and compliance checks. The draft DCO [EN010152/APP/3.1] includes protective provisions for the protection of electronic communication networks and utilities.		

4. Complementary Plans and Procedures

- 4.1.1 A suite of complementary environmental plans and procedures for the operation and maintenance phase will be developed alongside the detailed OEMP/have been included within the DCO application and set out proposed mitigation for the operation and maintenance phase, and further detailed plans will be prepared for further approval.
- a. **Framework Landscape and Ecology Management Plan (LEMP) [EN010152/APP/7.14];**
 - b. **Framework Drainage Strategy [EN010152/APP/6.3];**
 - c. **Framework Traffic Management Plan [EN010152/APP/7.17];**
 - d. **Framework Soils Management Plan [EN010152/APP/7.10];**
 - e. **Framework Public Right of Way (PRoW) Management Plan [EN010152/APP/7.13];**
 - f. **Framework Site Waste Management Plan [EN010152/APP/7.10]; and**
 - g. **Framework Battery Safety Management Plan [EN010152/APP/7.16]**

5. Implementation and Operation

- 5.1.1 The detailed OEMP will set out all roles, responsibilities and actions required in respect of implementation of the measures described in this Framework OEMP, including:
- a. An organogram showing team roles, names and responsibilities;
 - b. Training requirements for relevant personnel on environmental topics;
 - c. Information on-site briefings and toolbox talks that will be used to equip relevant staff with the necessary level of knowledge to follow environmental control procedures;
 - d. Measures to advise employees of changing circumstances as work progresses;
 - e. Communication methods;
 - f. Document control;
 - g. Monitoring, inspections and audits of site operations; and
 - h. Environmental emergency procedures.

6. Monitoring and Reporting

6.1 Monitoring

- 6.1.1 Monitoring and reporting will be undertaken for the duration of the operation and maintenance phase to demonstrate the effectiveness of the measures set out in the detailed OEMP and related construction controls and allow for corrective action to be taken where necessary.

- 6.1.2 As part of the monitoring process a designated Environmental Manager will observe site activities and report any deviations from the OEMP in a logbook, along with the action taken and general conditions at the time. In addition, the Environmental Manager will conduct regular walkover surveys which will be documented and arrange regular formal inspections to ensure the requirements of the detailed OEMP are being met.
- 6.1.3 The Environmental Manager would also act as day-to-day contact with relevant local authorities and other regulatory agencies, such as the Environment Agency.

6.2 Records

- 6.2.1 The Environmental Manager will retain records of environmental monitoring and implementation of the detailed OEMP. This will allow provision of evidence that the detailed OEMP are being implemented effectively. These records will include:
- a. Results of routine site inspections by Environmental Manager/ Project Manager;
 - b. Environmental surveys and investigations;
 - c. Environmental Action Schedule;
 - d. Environmental equipment test records;
 - e. Licences and approvals; and
 - f. Corrective actions taken in response to incidents, breaches of the approved detailed OEMP or complaints received from a third party.
- 6.2.2 The detailed OEMP will be updated if it is necessary to add additional control measures, with a full review as required. Existing control measures and mitigation will not be amended without prior agreement with the local authorities.

7. References

- Ref. 1 HMSO (2008) The Planning Act 2008, Available at: https://www.legislation.gov.uk/ukpga/2008/29/pdfs/ukpga_20080029_en.pdf.
- Ref. 2 Institute of Lighting Professionals and the Bat Conservation Trust (2023) Guidance Note 8 Bats and artificial lighting at night. Available at: <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/> <https://theilp.org.uk/publication/guidance-note-8-bats-and-artificial-lighting/> [Accessed 3 October 2023].
- Ref. 3 Institute of Lighting Professionals and the Bat Conservation Trust (2021) Guidance Note 1 for the reduction of obtrusive light. Available at: <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021/> [Accessed 3 October 2023].
- Ref. 4 HMSO (2005) Hazardous Waste Regulations 2005. Available at: http://www.legislation.gov.uk/uksi/2005/894/pdfs/uksi_20050894_en.pdf
- Ref. 5 HMSO (2011) Waste (England and Wales) Regulations 2011. Available at: http://www.legislation.gov.uk/uksi/2011/988/pdfs/uksi_20110988_en.pdf.
- Ref. 6 Gov.uk (2003). The Road Vehicles (Authorisation of Special Types) (General) Order 2003. Available at: <https://www.legislation.gov.uk/uksi/2003/1998/contents/made> [Accessed 09 October 2023].
- Ref. 7 Gov.uk (2021). APHA animal disease alert subscription service. Available at: <https://www.gov.uk/guidance/apha-alert-subscription-service#:~:text=The%20Animal%20and%20Plant%20Health%20Agency#:~:text=The%20Animal%20and%20Plant%20Health%20Agency> [Accessed 24 September 2024].
- Ref. 8 The Stationery Office (TSO). (2002) Control of Substances Hazardous to Health Regulations 2002 (COSHH 2002). Available at: <https://www.legislation.gov.uk/uksi/2002/2677/contents/made> (Accessed: [24 September 2024]).
- Ref. 9 TSO. (2001) Control of Pollution (Oil Storage) (England) Regulations 2001. Available at: <https://www.legislation.gov.uk/uksi/2001/2954/contents/made> (Accessed: [24 September 2024]).
- Ref. 10 National Grid. (n.d.) Working near electricity equipment. Available at: <https://www.nationalgrid.com/sites/default/files/documents/Working%20near%20electricity%20equipment.pdf> [Date accessed 23/09/2024].
- Ref. 11 National Grid (2007). Specifications for Safe Working in the Vicinity of National Grid High Pressure Gas Pipelines and Associated Installations - Requirements for Third Parties. Available at: <https://www.nationalgrid.com/sites/default/files/documents/24347-Working%20safely%20in%20the%20vicinity%20of%20above%207bar%200pipelines.pdf> [Date accessed 23/07/2024].
- Ref. 12 Northern Gas Networks (2017). Working safely near high pressure gas pipelines and associated installations: Third party requirements. Available at: <https://www.northerngasnetworks.co.uk/wp->

content/uploads/2018/02/Working-safely-near-high-pressure-gas-pipelines-and-associated-installations.pdf [Date accessed 23/07/2024].

Abbreviations

Abbreviation/Term	Definition
AEP	Annual Exceedance Probability
AIL	Abnormal Invisible Load
ALC	Agricultural Land Classification
AMS	Archaeological Mitigation Strategy
BCT	Bat Conservation Trust
BESS	Battery Energy Storage System Area
BNG	Biodiversity Net Gain
BOOM	Build Own Operate Maintain
BSMP	Battery Safety Management Plan
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
DCO	Development Consent Order
DEMP	Decommissioning Environmental Management Plan
EIA	Environmental Impact Assessment
ES	Environmental Statement
ha	hectares
HDD	Horizontal Directional Drilling
HGV	Heavy Goods Vehicle
IBC	Intermediate Bulk Containers
IDB	Internal Drainage Board
ILP	Institute of Lighting Professionals
IR	Infrared
LEMP	Landscape and Ecological Management Plan
LGP	Low Ground Pressure
LGV	Light Goods Vehicle
MW	Megawatts
NETS	National Electricity Transmission System
NGR	National Grid Reference
NSIP	Nationally Significant Infrastructure Project
OEMP	Operational Environmental Management Plan

Glossary of Frequently Used Terms

Term	Definition
Applicant	Fenwick Solar Project Limited.
Biodiversity Net Gain (BNG)	BNG is a strategy to develop land and contribute to the recovery of nature. It is a way of making sure the habitat for wildlife is in a better state than it was before development.
Battery Energy Storage System (BESS)	Proposed development of a battery storage installation and associated development to allow for the storage and exportation of energy to the National Grid. The BESS would be stored in battery containers.
Detailed Construction Environmental Management Plan (CEMP)	Subsequently produced following the appointment of the contractor, when the detailed design of the Scheme is known, in accordance with a requirement of the DCO prior to commencing construction. It will be a live document and will provide a systematic approach to environmental management so that environmental risks are identified, incorporated in all decision-making and managed appropriately.
Development Consent Order (DCO)	Development consent is required pursuant to the Planning Act 2008 for Nationally Significant Infrastructure Projects. A development consent order is the order which grants development consent when an application is made to the Secretary of State.
Environmental effect	The consequence of an action (impact) upon the environment such as the decline of a breeding bird population as a result of the removal of hedgerows and trees.
Environmental impact	The change in the environment from a development such as the removal of a hedgerow.
Environmental Impact Assessment (EIA)	A process by which information about environmental effects of a proposed development is collected, assessed and used to inform decision making. For certain projects, EIA is a statutory requirement.
Environmental Statement (ES)	A document produced in accordance with the EIA Directive as transposed into UK law by the EIA Regulations to report the results of an EIA.
Existing National Grid Thorpe Marsh Substation	The existing substation at Thorpe Marsh which would connect the Solar PV Site to the National Grid.
Field Station Units	Single enclosures that comprise the inverters, a transformer, and switchgear in a single containerised unit.
Field Stations	Areas where electrical equipment such as central inverters, transformers, and switchgear are located.

Term	Definition
Framework CEMP	This document. Provides a framework from which a final CEMP will be developed to avoid, minimise or mitigate any construction effects on the environment.
Framework Decommissioning Environmental Management Plan (DEMP)	A specific plan developed to ensure that appropriate environmental management practices are followed during the decommissioning phase of a project.
Framework Operational Environmental Management Plan (OEMP)	A specific plan developed to ensure that appropriate environmental management practices are followed during the operation and maintenance phase of a project.
Grid Connection Corridor	Corridor which represents the maximum extent of land within which the cable route would be located.
Heavy Goods Vehicle (HGV)	A vehicle that has a weight over 3.5 tonnes.
Inverter	Inverters convert the direct current (DC) electricity collected by the PV modules into alternating current (AC), which allows the electricity generated to be exported to the National Grid. Battery energy storage systems also use inverters to convert between DC and AC. The batteries function in DC and electricity must be converted to AC to pass into or from the grid.
Mitigation	Measures including any process, activity, or design to avoid, prevent, reduce, or, if practicable, offset any identified significant adverse effects on the environment.
Nationally Significant Infrastructure Projects (NSIP)	NSIPs are large scale developments such as certain new harbours, power generating stations (including wind farms), highways developments and electricity transmission lines, which require a type of consent known as 'development consent' under procedures governed by the Planning Act 2008 (and amended by the Localism Act 2011).
On-Site Cables	Cables within the Solar PV Site which have a voltage of up to 33kV.
On-Site Substation	New substation within the Solar PV Site that would receive electricity from the Field Stations for export to the National Grid.
Order Limits	The limits shown on the land plans and works plans within which the authorised development may be carried out and land acquired or used.
Scheme	The project (as described in Section 1.3 of this document) for which the DCO Applicant is sought.

Term	Definition
Solar PV Site	The portion of the Scheme where Solar PV Panels, BESS Area, and associated infrastructure would be located.
Solar array	Combining several solar panels creates an array.
Solar photovoltaics (PV)	Solar electricity panels, also known as PV, capture the sun's energy and convert it into electricity for consumer use.
Solar PV Panels	Convert sunlight into electrical current (as direct current, DC). Typically consist of a series of photovoltaic cells beneath a layer of toughened, low reflectivity glass.
String inverters	A device used with solar arrays to convert the energy that is generated (DC) to usable electricity for a home (AC).
Switchgear	Switchgear is an integral part of an electric power system. It includes fuses, switches, relays, isolators, circuit breaker, potential and current transformer, indicating device, lightning arresters, etc. that protects electrical hardware from faulty conditions.
The Site	The collective term for the Solar PV Site, Grid Connection Corridor, and the Existing National Grid Thorpe Marsh Substation.
Transformers	Transformers control the voltage of the electricity generated across the site before it reaches the electrical infrastructure.