

Gate Burton Energy Park

EN010131

Framework Construction Environmental Management Plan
Document Reference: EN010131/APP/7.3
Revision 3
August 2023

APFP Regulation 5(2)(q)
Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Prepared for:

Gate Burton Energy Park Limited

Prepared by:

AECOM Limited

© 2023 AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECOM.

Table of Contents

1.	Introduction	5
1.1	Introduction.....	5
1.2	The Applicant	6
1.3	The Scheme	6
2.	Construction Environmental Management	7
2.1	Roles and Responsibilities	7
2.2	Construction Programme	8
2.3	Working Hours	8
2.4	Landscape and Ecology.....	9
2.5	Control of Noise.....	9
2.6	Control of Light.....	9
2.7	Traffic Management and Parking Provision	9
2.8	Off Site Delivery Routes.....	10
2.9	Recycling and Disposing of Waste.....	10
2.10	Security.....	10
2.11	Responding to Environmental Incidents and Emergencies	10
2.12	Good Practice	11
3.	Mitigation and Monitoring	12
3.1	Purpose	12
4.	Complementary Plans and Procedures	47
5.	Implementation and Operation	49
6.	Monitoring and Reporting	49
6.1	Monitoring	49
6.2	Records	50
7.	References.....	51
	Appendix A. Outline Risk Assessment Methods (RAMs)	52
	Appendix B. Outline Tree Protection Measures	56

Tables

Table 2-1	Core working hours.....	8
Table 3-2	Cultural Heritage	13
Table 3-3	Ecology and Biodiversity.....	15
Table 3-4	Water Environment	24
Table 3-5	Landscape and Visual Amenity	32
Table 3-6	Noise and Vibration.....	34
Table 3-7	Socio-Economics and Land-Use	36
Table 3-8	Transport and Access.....	37
Table 3-9	Glint and Glare.....	38
Table 3-10	Telecommunications, Television Reception and Utilities	39
Table 3-11	Waste.....	39
Table 3-12	Major Accidents and Disasters	40
Table 3-13	Air Quality.....	40
Table 3-14	Arboriculture.....	44

1. Introduction

1.1 Introduction

- 1.1.1 This document provides the framework for the Construction Environmental Management Plan (CEMP) for Gate Burton Energy Park (hereafter referred to as the Scheme), in relation to an application for a Development Consent Order (DCO) for the construction, operation and maintenance, and decommissioning of the Scheme.
- 1.1.2 A DCO would provide the necessary authorisations and consents for the Scheme which comprises a solar photovoltaic (PV) electricity generating facility with a total capacity exceeding 50 megawatts (MW), an energy storage facility and an export/import connection to the National Grid, via an extension of the existing Cottam substation.
- 1.1.3 The aim of this Framework CEMP is to provide a clear and consistent approach to the control of construction activities in the Site (defined at 1.3.1 below). This document does not address operational or decommissioning activities, which would be subject to separate environmental management plans and procedures (**Framework Operational Environmental Management Plan (OEMP) [EN010131/APP/7.4]** and **Framework Decommissioning Environmental Management Plan (DEMP) [EN010131/APP/7.5]**).
- 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) (Ref. 15Ref. 2) 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 construction of the Scheme and describes a range of 'industry standard' or best practice mitigation measures. This Framework CEMP outlines these construction mitigation measures and sets out the monitoring activities designed to ensure that such mitigation measures are carried out.
- 1.1.5 It is envisaged that a CEMP may be prepared, approved, and implemented for individual components of the Scheme (e.g. one CEMP for works in the Grid Connection Corridor and one for works in the Solar and Energy Storage Park Site). As a result, there could be multiple CEMP(s) prepared in accordance with the parts of this Framework CEMP.
- 1.1.6 This document provides the likely structure of the CEMP(s) and some outline information relevant to the CEMP(s). These detailed CEMP(s) will be produced following grant of the DCO, appointment of contractor(s), and prior to the start of the construction of the Scheme. It is envisaged that there could be multiple detailed CEMP(s) or that the CEMP(s) are prepared, approved, and implemented for specific works or phases of the Scheme.
- 1.1.7 The detailed CEMP(s) will be prepared in accordance with this Framework CEMP, secured through a Requirement of the DCO and would be approved

by the appropriate planning authorities in advance of starting the construction works.

- 1.1.8 The key elements of this Framework CEMP are:
- a. An overview of the Scheme and associated construction 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.
- 1.1.9 In summary, this Framework CEMP 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.
- 1.1.10 The appointed contractor(s) will be responsible for working in accordance with the environmental controls documented in the Framework CEMP, pursuant to the DCO. The overall responsibility for implementation of the CEMP(s) will lie with the appointed contractor(s) as a contractual responsibility to the Applicant, as the Applicant is ultimately responsible for compliance with the Requirements of the DCO.
- 1.1.11 This Framework CEMP has been designed with the objective of compliance with the relevant environmental legislation and mitigation measures set out within the ES.
- 1.1.12 Any additional construction licenses, permits, or approvals that are required will be listed in the CEMP(s), including any environmental information submitted in respect of them.

1.2 The Applicant

- 1.2.1 The Applicant, Gate Burton Energy Park Ltd has submitted the DCO Application for the construction, operation and decommissioning of the Scheme. 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 Business, Energy and Industrial Strategy (hereafter referred to as the 'Secretary of State') pursuant to the Planning Act 2008 (Ref. 3).

1.3 The Scheme

- 1.3.1 The Site comprises the 'Solar and Energy Storage Park' and the 'Grid Connection Corridor', totalling approximately 824 hectares (ha). The Solar and Energy Storage Park will contain the solar PV panels, Battery Energy Storage System (BESS) and associated development, comprising approximately 652ha. The Grid Connection Corridor comprises approximately 172ha and will connect the Solar and Energy Storage Park and Cottam National Grid Substation.

- 1.3.2 The Site is located in the administrative areas of Bassetlaw District Council and West Lindsey District Council, and at county level within Nottinghamshire County Council and Lincolnshire County Council.
- 1.3.3 The Scheme comprises the installation of solar photovoltaic (PV) generating panels, on-site battery storage (referred to as the BESS), and associated infrastructure.
- 1.3.4 The land required for the construction, operation and maintenance, and decommissioning of the Scheme is shown on **ES Volume 2: Figure 1-2 [EN010131/APP/3.2]**, and described in **ES Volume 1, Chapter 2: The Scheme [EN010131/APP/3.1]**. This includes land required for temporary and permanent uses.
- 1.3.5 The detailed CEMP(s) will include (as relevant to that CEMP) plans showing the land within each administrative area and the Site boundary, including construction compound areas. Compounds will comprise those areas identified within the Works Plans (Work No 6) comprising one main compound (off the A156), three secondary compounds and two vehicle holding and laydown areas at the Solar and Energy Storage Park and three compounds within the grid connection corridor. In addition, 50m x 50m unloading areas will be located at each of the grid corridor access locations to facilitate safe exit off the highway, unloading and safe egress back onto the highway.

2. Construction Environmental Management

2.1 Roles and Responsibilities

- 2.1.1 Key roles and responsibilities during the construction phase in managing environmental impacts will likely include, but are not limited to:
 - Site Manager – Overall responsibility for activity onsite, and will be based onsite full time.
 - Construction Project Manager – Overall responsibility for ensuring all elements in the DCO, CEMP(s) and all environmental legal and other requirements are implemented, and appropriately resourced, managed, reviewed and reported.
 - Environment Manager – Responsible for the overall management of environmental aspects on site, ensuring environmental legislation and best practices are complied with, and environmental mitigation and monitoring measures identified are implemented. The Environment Manager will oversee environmental monitoring on-site and carry out regular environmental site inspections, reporting and responding to any incidents or non-compliance. The Environment Manager will liaise with relevant environmental bodies and other third parties as appropriate.
 - Environmental Clerk of Works (EnCoW) – Oversee the management of, and provide advice about, environmental and ecological risks during

construction including for example, management of protected species, surface water management, pollution, air quality and noise.

- Ecological Clerk of Works (ECoW) – Monitor and record impacts arising from the Scheme in accordance with this CEMP; Management of the risks to biodiversity on construction sites through provision of specialist ecological advice, guidance and technical support and providing practical solutions; Engagement with other specialists, as appropriate (e.g. an arboriculturalist where works are in the vicinity of a tree with a Tree Preservation Order (TPO)).
- Health and Safety Manager – Responsible for the monitoring and controlling of health and safety compliance and related rules and regulations on-site.
- Community Liaison Officer - A Community Liaison Group will be set up in accordance with the relevant DCO requirement prior to construction and will continue through until final commissioning of the Scheme as a formal forum for local issues to be raised. A Community Liaison Officer will be appointed to lead discussions with local communities, and also act as the primary point of contact should there be any queries or complaints.

2.1.2 These roles and responsibilities are indicative and will be confirmed in the detailed CEMP(s).

2.2 Construction Programme

2.2.1 Construction is anticipated to start in Q1 2025 and will require an estimated 24 to 36 months, with operation therefore anticipated to commence around Q1 2028.

2.3 Working Hours

2.3.1 The core working hours are defined in Table 2-1.

Table 2-1 Core working hours

Works	Working Hours
Summer	07:00 – 19:00 Monday to Friday and Saturday 09:00-13:00 with no Sunday or Bank Holiday working.
Winter	08:00 – 18:00 Monday to Friday and Saturday 09:00-13:00 with no Sunday or Bank Holiday working.

2.3.2 Some works activities may need to occur out of these hours/times due to activities requiring to be undertaken continuously (such as horizontal direction drilling (HDD) and cable jointing). Where work outside of times is necessary prior notification will be provided to the local planning authority (LPA).

2.3.3 Additionally, quiet non-intrusive works such as the installation of PV modules may take place over longer periods during the high summer and other quiet non-intrusive works such as electrical testing, commissioning and inspection may take place over longer periods throughout the year.

2.4 Landscape and Ecology

2.4.1 The **Outline Landscape and Ecological Management Plan [EN010131/APP/7.10]** outlines the landscape, biodiversity and heritage impact avoidance measures, as well as the habitat restoration, enhancement, management, and monitoring measures to be implemented once the Scheme is operational. Whilst there is inherently a crossover between the **Outline LEMP** and **Framework CEMP [EN010131/APP/7.3]**, this document aims at capturing all construction related mitigation. Mitigation by design and Scheme evolution is secured in the **Outline Design Principles [EN010131/APP/2.3]** and **Outline Landscape and Ecological Management Plan [EN010131/APP/7.10]**

2.5 Control of Noise

2.5.1 For all works that are undertaken outside of core work periods, a Section 61 consent will need to be obtained by the principal contractor. This will be agreed with the local planning authority and contain details on the methodology, mitigation, communication strategy and monitoring. See section 3 for all mitigation measures related to noise.

2.6 Control of Light

2.6.1 During winter months, mobile lighting towers with a power output of 8 kilo volt-amperes (kVA) may be used during construction in isolated work areas. There will also be lighting at the main construction compounds while construction is underway.

2.6.2 Temporary construction site lighting, for example in the form of mobile lighting towers with a power output of 8kVA, will be required in areas where natural lighting is unable to reach (sheltered/confined areas) and during core working hours within winter months. Artificial lighting would be provided to maintain sufficient security and health and safety for the Order limits, whilst adopting the mitigation principles to avoid excessive glare and minimise spill of light to nearby receptors (including ecology and residents) outside of the Order limits as far as reasonably practicable. Motion detection security lighting will also be used to avoid permanent lighting.

2.6.3 All construction lighting will be deployed in accordance with the following recommendations to prevent or reduce the impact on human and ecological receptors:

- The use of lighting will be minimised to that required for safe site operations;
- Lighting will utilise directional fittings to minimise outward light spill and glare (e.g. via the use of light hoods/cowls which direct light below the horizontal plane, preferably at an angle greater than 20° from horizontal); and
- Lighting will be directed towards the interior of the Order limits rather than towards the boundaries.

2.7 Traffic Management and Parking Provision

- 2.7.1 Traffic management mitigation measures are set out in the Framework Construction Traffic Management Plan (CTMP) (**ES Volume 3: Appendix 13-E [EN010131/APP/3.3]**) which is secured via a DCO requirement.
- 2.7.2 The Framework CTMP will also provide location and size of parking provisions on-site. Wheel cleaning facilities will be used by vehicles prior to exiting the Order limits onto the public highway if there is mud or debris from the construction site on the vehicles.

2.8 Off Site Delivery Routes

- 2.8.1 The Framework CTMP provides details of the designated routes for HGV movements and worker car movements. It also details any measures designed to reduce travel during peak hours on the local road network.

2.9 Recycling and Disposing of Waste

- 2.9.1 In order to control the waste generated during site preparation and construction, the contractor(s) will separate the main waste streams on-site, prior to transport to an approved, licensed third party waste facility for recycling or disposal.
- 2.9.2 A Site Waste Management Plan (SWMP) will be prepared by the contractor(s), which will specify the waste streams which would be monitored, and targets set with regards to the waste produced, including any re-use and recycling of materials. The SWMP will be finalised with specific measures to be implemented prior to the start of construction.
- 2.9.3 All waste to be removed from the Order limits will be undertaken by fully licensed waste carriers and taken to licensed waste facilities.

2.10 Security

- 2.10.1 Site security during construction will be managed by the contractor(s). The site security fencing will remain in place throughout the duration of the construction period. Any storage of materials will be kept secure to prevent theft or vandalism. A safe system for accessing the materials storage areas would be implemented by the contractor(s).

2.11 Responding to Environmental Incidents and Emergencies

- 2.11.1 An emergency response plan will be developed in consultation with the relevant local authority emergency planning officer, emergency services including the local fire service, as well as the Environment Agency in relation to responding to flood warnings and events.
- 2.11.2 The plan will detail the procedures for responding to incidents and emergencies on site, and any reporting.

2.12 Good Practice

- 2.12.1 The Considerate Constructors Scheme (CCS) will be adopted to assist in reducing pollution and nuisance from the Scheme, by employing good practice measures which go beyond statutory compliance.

3. Mitigation and Monitoring

3.1 Purpose

3.1.1 This section of the Framework CEMP sets out the mitigation measures to be included as a minimum in the detailed CEMP(s). It also sets out monitoring requirements and the responsible party identified for each mitigation measure or monitoring requirement. This section will be updated and developed following consent as part of the preparation of the CEMP(s).

Table 3-1 Climate Change

Potential Impact	Mitigation Measure	Monitoring
<p>Greenhouse Gas (GHG) emissions from construction traffic and equipment;</p> <p>Use of natural resources in construction materials; and</p> <p>Increased flood risk on-site due to climate change needing to be considered in the design.</p>	<p>Appropriate standard and good practice control measures will include:</p> <ul style="list-style-type: none"> a) Increasing recyclability by segregating construction waste to be re-used and recycled where reasonably practicable; b) Adopting the Considerate Constructors Scheme (CCS) to assist in reducing pollution, including GHGs, from the Scheme by employing best practice measures which go beyond the statutory requirements; c) Designing, constructing, and implementing 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 a higher recycled content; d) Encouraging the use of lower carbon modes of transport by identifying and communicating local bus connections and pedestrian and cycle access routes to/from the Scheme to all construction staff, and providing appropriate facilities for the safe storage of cycles; e) Liaising with construction personnel for potential to implement staff minibuses and car sharing options; f) Implementing a Travel Plan to reduce the volume of construction staff and employee trips to the Order limits; g) Switching off vehicles and plant when not in use and ensuring construction vehicles conform to current EU emissions standards; h) Conducting regular planned maintenance of the Scheme to optimise efficiency. 	<p>The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).</p>

- i) Minimising the duration of topsoil and construction material storage within the 1 in 100-year floodplain extent (Flood Zone 3);
- j) Appointing at least one designated Flood Warden who is familiar with the risks and remains vigilant to news reports, Environment Agency flood warnings, and water levels of the local waterways; and
- k) Health and safety plans developed for construction and decommissioning activities will take account of potential climate change impacts on workers, such as flooding and heatwaves.

Table 3-2 Cultural Heritage

Potential Impact	Mitigation Measure	Monitoring
Impacts to known buried archaeology	<p>Where it has not been possible to re-route the Grid Connection Corridor around buried archaeological remains, the use of HDD, as opposed to open cut trenching, has been proposed in a number of locations and these are marked as 'Avoidance Areas' in ES Volume 2: Figure 2-5 [EN010131/APP/3.2].</p> <p>An additional area of archaeological activity assessed as being of medium value has been identified following the results of the trial trench evaluation, within Field 16 of the Solar and Energy Storage Park (as illustrated on Figure 6 in ES Appendix 7-D [APP-120/3.3]). The archaeological remains comprise a Romano-British settlement site. Embedded mitigation is provided in the form of removal of Solar PV Panels from the Scheme design in this field, enabling preservation in-situ of these archaeological remains. During construction and operation, this panel free area will not be used for construction or operation-related activities. The boundary of the defined mitigation area will be fenced off from the Scheme.</p> <p>An area of archaeological activity assessed as being of high value was identified through analysis of the geophysical survey data, within Field 45 of the Solar and Energy Storage Park (as illustrated on Figure 2 in ES Appendix 7-D [APP-121/3.3]). Embedded mitigation is provided in the form of removal of Solar PV Panels from the Scheme design in this field enabling preservation in-situ of these archaeological remains. During construction and operation, this panel free area will not be used for construction or operation-related activities except for a route of access that runs north-south along the eastern boundary of the field. The boundary of the field will be fenced off from the Scheme, including along the access route.</p>	<p>Any monitoring will be detailed in the Archaeological Mitigation Strategy [EN010131/APP/7.6].</p> <p>Monitoring of additional screening is detailed in the Outline LEMP [EN010131/APP/7.10].</p>

Potential Impact

Mitigation Measure

Monitoring

Impacts to historical setting

Construction Exclusion Zones:

- a) The use of panel free buffer zones within the settings of heritage assets, including a 100m buffer area to the east of the non-designated Gate Burton park. During construction this panel free area will not be used for any construction-related activities or laydown areas.
- b) The retention of a panel free linear connection between the non-designated Gate Burton park and Burton Wood. During construction this panel free area will not be used for construction-related activities except for a route of access that runs north-south along the western boundary of the woodland;
- c) A buffer area around the non-designated Clay Farm and Siding Farm. During construction these panel-free areas will not be used for any construction-related activities or laydown areas;
- d) A buffer area in the vicinity of Heynings Priory scheduled monument to retain its connection with a probably associated building identified in the geophysical survey in Field 45 (as illustrated on Figure 2 in **ES Appendix 7-D [APP-121/3.3]**) and to retain its landscaped setting within a 'bowl' of lower-lying boggy ground. During construction this panel free area will not be used for construction-related activities except for a route of access that runs north-south along the eastern boundary of the field.

Screening:

- e) Appropriate and sensitive screening to minimise the visual intrusion of the Scheme, while avoiding, as far as practicable, obscuring or intruding upon important views and relationships between heritage assets or significantly altering historic design intention.
- f) Any mitigation planting has taken into consideration the historic landscape character as appropriate, and most of the proposed new boundary planting within the Site follows boundaries shown on the relevant Enclosure and tithe maps, and historic OS maps. Planting as mitigation to screen views has been limited to avoid the creation of new impacts; rather, it has been used to enhance existing screening and/ or futureproof against the loss of existing planting, as appropriate.
- g) The hedgerow that is required to be removed for visibility splays during construction will either be cut down to the base or where necessary replanted for the operational phase.

Potential Impact	Mitigation Measure	Monitoring
Potential Cumulative Effects with Cottam and West Burton solar projects on buried archaeology within the Shared Grid Connection Corridor	An outline of the proposed mitigation within the shared grid connection corridor with the Cottam and West Burton solar projects is detailed in the AMS, Appendix B [EN010131/APP/7.6].	

Table 3-3 Ecology and Biodiversity

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
Non-statutory sites (15 sites of county importance) within and adjacent to the Order limits	<p>Construction Exclusion Zones: Security fencing will be implemented early in the construction phase. This fence will restrict construction activity in the Construction Exclusion Zone and will protect the Local Wildlife Sites (LWS's) within the vicinity of the Order limits. Security fencing will not be placed within the ancient woodland buffer zone. Security fencing can be placed within the buffer zone of non-ancient woodland and hedgerow areas except where this would encroach within the RPAs of veteran trees. In this instance, fencing will be micro-sited to avoid veteran or protected tree RPAs.</p> <p>Grid Connection Corridor Crossing Points: The construction of the Grid Connection Corridor, where it crosses Cow Pasture Lane Drains LWS, will be undertaken using HDD methods to lay cabling, therefore avoiding impacts to the drain and hedge, with setbacks of at least 10m from the centreline of the drain, which is considered sufficient to mitigate for potential hazards such as chemical and soils spills into watercourse and avoid potential direct impacts to the LWS and riparian habitats. No other LWS's will be crossed by the Grid Connection Corridor.</p> <p>Grid Connection Corridor Access: Access for construction of the Grid Connection Corridor will utilise an existing access track that runs alongside Cow Pasture Lane Drains LWS. However, where there is a need to cross the LWS, this will be via a bailey bridge, rather than culvert to minimise negative impacts.</p> <p>Construction Management: Construction compounds will be setback from this LWS with a minimum 10m from the centre line of the watercourse. Furthermore, measures to ensure incursion into this LWS does not occur will be put in place, e.g. security fencing, which will be implemented at an early stage.</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation within LWS's, e.g. through the safe storage of chemicals / other hazardous materials (e.g. fuel) reaching watercourses during flood events during construction.</p>	<p>The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).</p> <p>No ECoW required.</p>

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
<p>Retained Notable Habitats</p> <p>Habitats - Broad-leaved woodland (including ancient / semi-natural woodland) occurring within, or adjacent to, the Order limits and including individual retained trees</p> <p>Habitats - Acid Grassland (semi-improved) within the Grid Connection Corridor</p> <p>Habitats – Marsh / Marshy grassland</p> <p>Habitats – Swamp and Standing Water</p>	<p>Construction Avoidance: The Scheme design retains all woodland habitats, a small area (0.58ha) of acid grassland within the Grid Connection Corridor (at Cottam Power Station), all marshy grassland and all standing water (with swamp habitat (reed) fringes).</p> <p>Construction Exclusion Zone: A 15m buffer will be implemented from woodland habitats and no construction activities will be permitted. This buffer has been incorporated into the Scheme design to protect trees and woodland. Other retained trees outside of woodland habitats and adjacent to construction working areas will be protected by clearly defined root protection areas, concordant with the requirements for each individual tree, to prevent damage/compaction of roots by plant and other machinery and prevent direct or indirect impacts to trees. Security fencing will be implemented early in the construction phase to prevent incursion into the Construction Exclusion Zones protecting retained habitats.</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specified requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) to prevent contaminants reaching retained habitats during construction.</p>	<p>The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).</p> <p>No ECoW required.</p>
<p>Habitats - Coastal and Floodplain Grazing Marsh – within the Grid Connection Corridor</p>	<p>Construction Exclusion Zone: Security fencing will be implemented early in the construction phase. This fence will restrict construction activity in the Construction Exclusion Zone and will protect Coastal and Floodplain Grazing Marsh within the Grid Connection Corridor. Security fencing will be implemented early in the construction phase to prevent incursion into the Coastal and Floodplain Grazing Marsh.</p> <p>Grid Connection Corridor Crossing: The crossing of the River Trent will be undertaken using HDD methods to lay cabling, with a sufficient setback and Avoidance Area's in ES Volume 2: Figure 2-5 [EN010131/APP/3.2] to prevent impacts to Coastal and Floodplain Grazing Marsh either side of the River Trent. As such, launch and exit pits will be located outside of this habitat, which is considered sufficient to mitigate for potential hazards such as chemical and soils spills into watercourses and avoid potential direct impacts to the River Trent, Coastal and</p>	<p>The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).</p>

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
	<p>Floodplain Grazing Marsh and protected species using them (such as Otter, which use the river for commuting and foraging).</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specified requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) to prevent contaminants reaching retained habitats during construction.</p>	<p>No ECoW required.</p>
<p>Habitats - Running Water within and adjacent to the Order limits</p>	<p>Construction Exclusion Zone: Riparian habitat along the margins of the banks of watercourses will be outside of 10m undeveloped buffer between watercourses and the developable area of the Scheme. These buffers have been incorporated into the Scheme design to protect watercourses. Security fencing around the Scheme will be implemented early in the construction to prevent incursion into Construction Exclusion Zones protecting running water.</p> <p>Grid Connection Corridor Crossing: The construction of the Grid Connection Corridor across avoidance areas will be undertaken using HDD methods to lay cabling. This will avoid impacts to watercourses, including the Coastal and Floodplain Grazing Marsh either side of the River Trent, with launch and exit pits located outside of this habitat. This method is considered sufficient to mitigate for potential hazards such as chemical and soils spills into watercourses and avoid potential direct impacts to the River Trent, Coastal and Floodplain Grazing Marsh and Otter, which use the river for commuting and foraging.</p> <p>Construction Crossing Points: Within the Solar and Energy Storage Park, the use of existing watercourse crossing points will be used for the majority of construction access, where practicable.</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specifies requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) reaching watercourses during flood events during construction.</p>	
<p>Habitats – Hedgerows, throughout the Order limits</p>	<p>Construction Exclusion Zone: A buffer of at least 5m will be maintained between retained hedgerows without trees and the developable area of the Scheme where no construction activities are permitted. These buffers have been incorporated into the Scheme design to protect hedgerows. Where individual trees are located within</p>	

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
	<p>hedgerows, the undeveloped buffer will be extended to include provision for the root protection area (see above). Security fencing will be implemented early in the construction phase to prevent incursion into hedgerows.</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specified requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) to prevent contaminants reaching retained habitats during construction.</p>	
Species - Terrestrial Invertebrates	<p>Construction Avoidance: The Scheme design retains habitats of greater terrestrial invertebrate interest (such as woodland, watercourses, hedgerows), with measures to ensure incursion into these habitats does not occur to be put in place as presented above, e.g. security fencing, which will be implemented at an early stage to protect retained habitats from incursion during construction.</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specified requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) to prevent contaminants reaching retained habitats during construction.</p>	<p>The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).</p> <p>No ECoW required.</p>
Species - Aquatic invertebrates	<p>During activities where there are direct impacts to watercourses or water bodies, for example through drain-down, culverting, open-trenching, or realignment / diversion, the following mitigation is proposed:</p> <p>Avoidance of key fish migration timings wherever possible e.g., April to June for European eel; September to November for Atlantic salmon.</p> <p>Fish rescue and/or translocation during drain-down of watercourses or water bodies, and during the installation of culverts or over-pumping for open trenching through watercourses/ditches; and</p> <p>Consideration given to invasive non-native species (INNS) known to be present in water bodies, most notably Nuttall's waterweed, with appropriate biosecurity measures implemented.</p> <p>The following pollution prevention measures will be implemented:</p> <p>Prevent erosion and runoff by minimising vegetation and soil disturbance. Ensure the implementation of exclusion buffer zones (10m) for the full length of watercourses within the construction buffer zone. Include further preventative measures, such as runoff/settlement ponds and/or silt fencing if necessary;</p>	<p>Pre-construction surveys will be undertaken in advance of the site clearance and construction phase.</p> <p>The detailed CEMPs will include Reasonable Avoidance Measures (RAMs) for</p>

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
	<p>Where construction vehicles are required to pass over the water bodies, vehicles/plant must be cleaned away from the water in dedicated vehicle washing areas to prevent potential pollutants entering the surface water system, before crossing over the water body;</p> <p>Control the spread of dust and sediment through fine water spraying of vehicle routes;</p> <p>Regularly service, monitor and inspect on-site plant for leaks to prevent construction spillages and to ensure pollutants do not enter the waterways. Refuel plant and machinery in dedicated refuelling areas, with drip-trays used routinely and spill kits available; and</p> <p>Cover and protect all surface water drainage systems from pollution and sediment input.</p>	<p>any protected species required.</p> <p>A monitoring programme will be provided in the Outline LEMP [EN010131/APP/7.10].</p>
<p>Species - Great Crested Newt</p>	<p>Construction Avoidance: The Scheme design retains standing water habitats that support Great Crested Newt, measures to ensure incursion into these habitats does not occur will be put in place, e.g. security fencing, which will be implemented at an early stage to protect retained habitats from incursion during construction. The pond and a 100m buffer of suitable Great Crested Newt habitat, which includes hedgerows, marginal habitat around the pond, ditches and boundary habitats will be retained and avoided. Habitat immediately surrounding the pond (i.e. non-arable habitat) will be retained and buffered.</p> <p>Pre-construction surveys: Pre-construction surveys will be undertaken to validate and, where necessary, support the baseline survey findings to confirm the presence and absence of Great Crested Newt to ensure proposed mitigation is up to date and appropriate. The purpose of these pre-construction surveys is to ensure mitigation during the construction phase is based on the latest protected species information. Surveys will be undertaken sufficiently in advance of construction (i.e. between April and June, prior to construction) to determine their presence and inform on any licence requirements. Where there have been any changes to Great Crested Newt distribution, Natural England licences will be sought and mitigation measures will be updated accordingly.</p> <p>Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specified requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) to prevent contaminants reaching retained habitats during construction.</p> <p>Construction of the Grid Connection Corridor: Construction of the Grid Connection Corridor within 250m of a pond supporting Great Crested Newt will predominantly be within low value habitats (arable farmland) for this species and will avoid all habitat within 100m of this pond. However, semi-improved grassland and scrub habitat (between 100m and 250m from the pond) is of potentially greater value to transient (dispersing / commuting)</p>	<p>The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).</p> <p>ECoW required.</p>

**Potential Impact
(Ecological
Receptor/Baseline
Information) and Scheme
Location**

Mitigation Measure

Monitoring

Great Crested Newt and an area of this habitat will be impacted upon during construction of the Grid Connection Corridor. Works in these areas will be undertaken under RAMs which are presented in **Appendix A.1**.

Species - Reptiles

Vegetation Removal: Vegetation clearance throughout the Order limits and where reptiles have been identified will be undertaken in advance of construction and at an appropriate time of year to avoid incidental injuring or killing of reptiles, concordant with the requirements for other species, such as nesting birds and Brown Hare. There will be no need to undertake any relocation of reptiles within the Order limits. Outline RAMS for reptiles are presented in **Appendix A.2**.

Construction Exclusion Zone: Whilst the design of the Solar and Energy Storage Park retains habitats of greatest value to reptiles, measures to ensure incursion into these habitats does not occur will be put in place, e.g. security fencing, which will be implemented at an early stage to protect retained habitats from incursion during construction.

Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specific requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) reaching watercourses during flood events during construction.

Animal welfare provisions: Precautionary measures will be implemented to prevent trapping wildlife in construction excavations. All excavations deeper than 1m will be covered or fenced overnight, or where this is not practicable, a means of escape will be fitted (e.g. battened soil slope or scaffold plank) to provide an escape route should any animals stray into the construction site and fall into an excavation.

Species - Birds –
throughout the Order limits

Construction Exclusion Zone: Security fencing will be implemented early in the construction phase to restrict construction activity in the Construction Exclusion Zone to protect retained habitats.

Pre-construction surveys: Pre-commencement surveys will be undertaken to determine the presence of any breeding species listed on Schedule 1 of the Wildlife and Countryside Act (Ref. 15Ref. 1). Surveys will be undertaken sufficiently in advance of construction to determine their presence *i.e.* within the respective breeding season. If such species are present prior to construction commencing, then the ECoW (experienced ornithologist) will advise as to whether a no disturbance buffer is required to avoid disturbance to Schedule 1 breeding species.

Timing of works: Where reasonably practicable, vegetation clearance works will be undertaken outside the bird breeding season (typically this is between 1st March and 31st August) and therefore between September and February inclusive. Where this is not reasonably practicable, an ecologist will inspect all areas of vegetation prior

**Potential Impact
(Ecological
Receptor/Baseline
Information) and Scheme
Location**

Mitigation Measure

Monitoring

to clearance, and clearance will only be undertaken subject to the instruction and requirements of the ecologist to protect any birds and their nests. Specific methods for vegetation clearance, undertaken within the bird breeding season (where required) is provided in **Appendix A.3**.

Species - Bats

Construction Exclusion Zone: A 15m buffer will be implemented from woodland habitats where no construction activities will be permitted. Furthermore, individual trees will have suitably protected root protection areas (see above) to ensure no direct or indirect impacts occur to trees. These buffers have been incorporated into the Scheme design to protect trees and woodland and will also protect any bat roosts (if present).

Perimeter security fencing: Security fencing around the Scheme will be implemented early in the construction phase. This fence will restrict construction activity in the Construction Exclusion Zone protecting woodland habitats and individual trees.

Pre-construction surveys: Pre-construction surveys will be undertaken to validate and, where necessary, support the baseline survey findings. The purpose of these pre-construction surveys is to ensure mitigation during the construction phase is based on the latest protected species information. The purpose of these surveys will be to determine the presence of bat roosts (where impacts are identified) to ensure proposed mitigation is up to date and appropriate. Surveys will be undertaken sufficiently in advance of construction (*i.e.* between April and September, prior to construction) to determine their presence and inform on any licence requirements. Furthermore, Natural England licences will be sought, and mitigation measures will be updated accordingly where there have been any changes.

Lighting for bats: Controls on lighting/illumination to minimise visual intrusion and potential adverse effects on sensitive ecological receptors, such as LWS's, woodland and individual trees, will be included to ensure no direct or indirect illumination of such areas and to protect bat roosts (if present).

Dust prevention and pollution control measures: The measures described in Table 3-4 Water Environment and Table 3-13 Air Quality will be adopted throughout construction to prevent pollution incidences and minimise habitat degradation to all retained habitats, e.g. through specified requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) to prevent contaminants reaching retained habitats during construction.

Species - Otter and Water Vole (see also Running Water)

Construction Exclusion Zone: The construction of the Scheme will avoid ditches and watercourses where Water Vole and Otter (*i.e.* the River Trent) were recorded, and these will be retained and suitably buffered (see Section 8.9). There will be no loss of habitat used by Water Vole or Otter anywhere within the Site. The

**Potential Impact
(Ecological
Receptor/Baseline
Information) and Scheme
Location**

Mitigation Measure

Monitoring

construction of the Scheme will be offset (>10 m) from any peripheral watercourses, used by Water Vole and Otter and these offsets will prevent disturbance to riparian habitats and any Water Vole using them.

Grid Connection Corridor Crossing: The crossing of the River Trent and other watercourses of value to Otter and Water Vole (i.e. where such species are identified as present or potentially present) will be undertaken using HDD methods to avoid impacts to watercourses, including riparian habitats. Set-backs of a minimum of 10m from the centreline of the watercourse is considered sufficient to mitigate for potential hazards such as chemical and soils spills into watercourses and avoid potential direct impacts to watercourses and species such as Otter, which use the River for commuting and foraging. Table 3-4 Water Environment specifies requirements for the safe storage of chemicals / other hazardous materials (e.g. fuel) reaching watercourses during flood events during construction.

Pre-construction surveys: Surveys will be undertaken to support the baseline survey findings where intrusive crossing methods of watercourses are proposed within the Grid Connection Corridor. The purpose of these pre-construction surveys is to ensure mitigation during the construction phase is based on the latest protected species information. Should there have been any changes to Otter or Water Vole distribution within the Grid Connection Corridor, Natural England licences and mitigation measures will be updated accordingly.

Construction Access: Where any access crosses watercourses used by Water Vole, non-intrusive methods to avoid physical disturbance to the watercourse will be utilised, avoiding disturbance to species, habitat loss and direct mortality for Water Vole.

Species - Badger

Exclusion: The Works Plans [EN010131/APP/5.2] allow the Scheme to be designed to avoid the loss of Badger setts, therefore the construction of the Scheme will retain and avoid the current locations of Badger setts recorded within the Site, with appropriate buffers of up to 30m to protect the setts. RAMS, including appropriate buffers (of up to 30m) around any identified Badger setts are outlined in **Appendix A.4**.

Pre-construction surveys: Surveys will be undertaken to support the baseline survey findings. The purpose of these pre-construction surveys is to ensure mitigation during the construction phase is based on the latest protected species information. Where there have been any changes to Badger distribution mitigation measures and avoidance areas will be updated accordingly. Where any Badger setts are identified as being lost, then a Natural England licence for closure will be sought.

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
	<p>Any mitigation strategy and, where required, application for species licences from Natural England for any relocation of animals away from construction areas will be prepared sufficiently in advance of the works to meet with the optimum time for mitigation and to minimise any changes to the construction programme.</p> <p>Animal welfare provisions: Implementation of measures to avoid animals being injured or killed within construction working areas, through excluding them from such areas and preventing them from falling into and becoming trapped in excavations. No excavations will remain open overnight and if excavations are required to be left open, ramps will be provided to allow animals a means of escape.</p>	
Species - Other mammals (including Brown Hare and Hedgehog)	<p>Vegetation clearance: Vegetation clearance will be undertaken in advance of construction and at an appropriate time of year to avoid incidental injuring or killing of animals, including Brown Hare and concordant with the requirements for other species such as nesting birds and reptiles.</p> <p>Animal welfare provisions: Implementation of measures to avoid animals being injured or killed within construction working areas, through excluding them from such areas and preventing them from falling into and becoming trapped in excavations. No excavations will remain open overnight and if excavations are required to be left open, ramps will be provided to allow animals a means of escape.</p>	
Invasive Species	<p>Pre-construction survey: A pre-construction survey will provide an update on the presence and location of any invasive species, the findings of which will inform the implementation of measures to prevent their spread into the wild. These surveys will inform the production of a Biosecurity Management Plan which will set out procedures to ensure that no invasive species are brought onto the Order limits.</p>	
Potential for obtrusive glare and light spill to impact on ecology.	<p>Mitigation of lighting to minimise the amount of light spill:</p> <ol style="list-style-type: none"> The use of lighting will be minimised to that required for safe site operations and security; Lighting will be controlled by infrared settings; Lighting will utilise directional fittings to minimise outward light spill and glare (e.g. via the use of light hoods/cowls which direct light below the horizontal plane, preferably at an angle greater than 20° from horizontal); and Lighting will be directed towards the middle of the Order limits rather than towards the boundaries. Motion detection security lighting will also be used to avoid permanent lighting. 	The Environmental Manager will regularly record compliance in a logbook. Specific responsibilities will be confirmed in the CEMP(s).

Potential Impact (Ecological Receptor/Baseline Information) and Scheme Location	Mitigation Measure	Monitoring
Cumulative effects from the Shared Grid Connection Corridor	Where practicable, joint mitigation will be undertaken with Cottam and West Burton solar projects within the Shared Grid Connection Corridor. The detailed CEMP(s) will outline all ecological mitigation, which will likely include combined pre-construction surveys, protected species mitigation, translocation (if required), monitoring and post construction reinstatement plans.	Monitoring will be outlined in the detailed CEMP(s).

Table 3-4 Water Environment

Potential Impact	Mitigation Measure	Monitoring
<p>Pollution of surface or groundwater due to deposition or spillage of soils, sediment, oils, fuels, or other construction chemicals, or through uncontrolled site run-off and foul waste water, or break out of drilling fluids when crossing watercourses using non-intrusive techniques;</p> <p>Potential impact on groundwater quality from piling and dewatering operations associated with watercourse crossings;</p> <p>Temporary impacts on sediment dynamics and hydromorphology within watercourses and waterbodies, e.g. where new crossings are required due to construction works to lay cables;</p>	<p>Appropriate standard and Good Practice Guidance (Guidance for Pollution Prevention (GPP)) methods will include (Ref. 12):</p> <ul style="list-style-type: none"> a) GPP 1: Understanding your environmental responsibilities – good environmental practices; b) GPP 2: Above ground oil storage; c) GPP 3: Use and design of oil separators in surface water drainage systems; d) GPP 4: Treatment and disposal of wastewater where there is no connection to the public foul sewer; e) GPP 5: Works and maintenance in or near water; f) GPP 8: Safe storage and disposal of used oils; g) GPP 13: Vehicle washing and cleaning; h) GPP 19: Vehicles: Service and Repair; i) GPP 20: Dewatering underground ducts and chambers; j) GPP 21: Pollution Incident Response Plans; k) GPP22: Dealing with spills; and l) GPP26: Safe storage – drums and intermediate bulk containers. 	<p>Temporary drainage will be monitored throughout construction. Specific details will be confirmed in detailed CEMP.</p> <p>The Water Management Plan (WMP), which will be an Appendix to the detailed CEMP, will include details of pre, during and post-construction water quality monitoring. This will be based on a combination of visual observations and reviews of the Environment Agency's automatic water quality monitoring network.</p>

Potential Impact

Temporary changes in flood risk from changes in surface water runoff and exacerbation of localised flooding, due to deposition of silt, sediment in drains and ditches;

Temporary changes in flood risk due to the construction of solar PV panels, site compound and storage facilities, which alter the surface water runoff from the Scheme; and

Potential impacts on local water supplies.

Mitigation Measure

Pollution Prevention Guidance (PPGs)

Construction phase operations would be carried out in accordance with guidance contained within the following PPGs:

- a) PPG6: Working at construction and demolition sites (Ref. 13);
- b) PPG7: Safe storage – the safe operation of refuelling facilities (Ref. 14); and
- c) PPG18: Managing fire water and major spillages (Ref. 15).

CIRIA documents and British Standards

Good practice guidance will be followed using key CIRIA documents and British Standards Institute documents:

- a) British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works Ref. 15Ref. 4);
- b) British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites (Ref. 5);
- c) C753 (2015) The SuDS Manual (second edition) (Ref. 11);
- d) C741 (2015) Environmental good practice on site guide (fourth edition) (Ref. 6);
- e) C648 (2006) Control of water pollution from linear construction projects, technical guidance (Ref. 7);
- f) C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice (Ref. 8);
- g) C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors (Ref. 9); and
- h) C736F Containment systems for prevention of pollution (Ref. 10).

Surface water management during construction:

- a) All reasonably practicable measures will be taken to prevent the deposition of fine sediment or other material in, and the pollution by sediment of, any existing watercourse, arising from construction activities;
- b) A temporary drainage system will be developed to prevent runoff contaminated with fine particulates from entering surface water drains without treatment. This will include identifying all land drains and waterbodies in the Order limits

Monitoring

Potential Impact

Mitigation Measure

Monitoring

- and ensuring that they are adequately protected using drain covers, sand bags, earth bunds, geotextile silt fences, straw bales, or proprietary treatment (e.g. lamella clarifiers);
- c) Site drainage, including surface runoff and dewatering effluents, will be discharged to sewers where practicable and relevant permissions will be obtained from the sewerage or statutory undertaker. Discharge to watercourses will only be permitted where discharge consent or other relevant approval has been obtained (where necessary);
 - d) Scheme drainage during construction will receive appropriate pollution control measures as agreed with the sewerage undertaker or the Environment Agency as appropriate. Holding or settling tanks, separators and other measures may be required, will be provided and maintained;
 - e) The relevant sections of BS 6031: Code of Practice for Earthworks will be followed for the general control of site drainage;
 - f) Where practical, earthworks will be undertaken during the drier months of the year. When undertaking earth moving works periods of very wet weather will be avoided, where practical, to minimise the risk of generating runoff contaminated with fine particulates. However, it is likely that some working during wet weather periods will be unavoidable, in which case other mitigation measures (see below) will be implemented to control fine sediment laden runoff.
 - g) To protect watercourses from fine sediment runoff, topsoil/subsoil will be stored a minimum of 20m from watercourses on flat lying land. Where this is not practicable, and it is to be stockpiled for longer than a two-week period, the material will either be covered with geotextile mats, seeded to promote vegetation growth, or runoff prevented from draining to a watercourse without prior treatment;
 - h) Appropriately sized runoff storage areas for the settlement of excessive fine particulates in runoff will be provided. Construction site runoff will either be treated on site and discharged under a Water Discharge Activity Permit from the Environment Agency to Controlled Waters (potentially also including infiltration to ground) or to the nearest public sewer with sufficient capacity for treatment following discussions with Anglian Water, or removed from site for disposal at an appropriate and licensed waste facility;

Potential Impact

Mitigation Measure

Monitoring

- i) Equipment and plant are to be washed out and cleaned in designated areas within the Scheme compound where runoff can be isolated for treatment before disposal as outlined above;
- j) Mud deposits will be controlled at entry and exit points to the Site using wheel washing facilities and/or road sweepers operating during earthworks activities or other times as required;
- k) Debris and other material will be prevented from entering surface water drainage, through maintenance of a clean and tidy site, provision of clearly labelled waste receptacles, grid covers and the presence of site security fencing; and
- l) The WMP will include details of pre, during and post-construction water quality monitoring.

Accidental spillage within the Order limits:

- a) 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.
- b) 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);
- c) Any plant, machinery or vehicles will be regularly inspected and maintained to ensure they are in good working order and clean for use in a sensitive environment. This maintenance is to take place off site if practicable or only at designated areas within the Scheme compound. Only construction equipment and vehicles free of all oil/fuel leaks will be permitted on the Order limits. Drip trays will be placed below static mechanical plant;
- d) All washing down of vehicles and equipment will take place in designated areas and wash water will be prevented from passing untreated into watercourses;
- e) All refuelling, oiling and greasing will take place above drip trays or on an impermeable surface which provides protection to underground strata and watercourses, and away from drains as far as reasonably practicable. Vehicles will not be left unattended during refuelling;

Potential Impact

Mitigation Measure

Monitoring

- f) As far as reasonably practicable, only biodegradable hydraulic oils will be used in equipment working in or over watercourses;
- g) All fixed plant used within the Order limits will be self-bunded;
- h) Mobile plant is to be in good working order, kept clean and fitted with plant 'nappies' at all times;
- i) The WMP will include details for pollution prevention.
- j) Spill kits and oil absorbent material will be carried by mobile plant and located at high risk locations across the Order limits and regularly topped up. All construction workers will receive spill response training and tool box talks;
- k) The Order limits will be secure to prevent any vandalism that could lead to a pollution incident;
- l) Construction waste/debris are to be prevented from entering any surface water drainage or water body;
- m) Surface water drains on public roads trafficked by plant or within the construction compound will be identified and, where there is a risk that fine particulates or spillages could enter them, the drains will be protected (e.g. using covers or sand bags) or the road regularly cleaned by road sweeper;
- n) Suitable facilities for concrete wash water (e.g. geotextile wrapped sealed skip, container or earth bunded area) will be adequately contained, prevented from entering any drain, and removed from the Site for appropriate disposal at a suitably licenced waste facility; and
- o) Water quality monitoring of potentially impacted watercourses will be undertaken to ensure that pollution events can be detected against baseline conditions and can be dealt with effectively.

Management of flood risk:

- a) Topsoil and other construction materials will be stored outside of the 1 in 100 year floodplain extent where feasible. If areas located within Flood Zone 2/3 are to be utilised for the storage of construction materials, this would be done in accordance with the applicable flood risk activity regulations, if required;
- b) Any fencing should be designed to prevent minor obstructions occurring allowing the continuation of flow routes (if present) unimpeded through the Site;

Potential Impact

Mitigation Measure

Monitoring

- c) Connectivity will be maintained between the floodplain and the adjacent watercourses, with no changes in ground levels within the floodplain as far as practicable;
- d) The contractor will monitor weather forecasts on a monthly, weekly, and daily basis, and plan works accordingly. For example, works in the channel of any watercourse will be avoided or halted were there to be a significant risk of high flows or flooding; and
- e) The construction laydown area site office and supervisor will be notified of any potential flood occurring by use of the Floodline Warnings Direct or equivalent service.

Details of the response to an impending flood will include:

- a) A 24-hour availability and ability to mobilise staff in the event of a flood warning;
- b) The removal of all plant, machinery and material capable of being mobilised in a flood for the duration of any holiday close down period where there is a forecast risk that the site may be flooded;
- c) Details of the evacuation and site close down procedures;
- d) Arrangements for removing any potentially hazardous material and anything capable of becoming entrained in floodwaters, from the temporary works areas;
- e) The contractor will sign up to Environment Agency flood warning alerts and describe in the Emergency Response Plan the actions it will take in the event of a flood event occurring. These actions will be hierarchical meaning that as the risk increases the contractor will implement more stringent protection measures;
- f) If water is encountered during below ground construction, suitable de-watering methods will be used. Any groundwater dewatering required in excess of the exemption thresholds will be undertaken in line with the requirements of the Environment Agency (under the Water Resources Act 1991) and the Environmental Permitting Regulations (2016); and
- g) Safe egress routes and exits are to be maintained at all times when working in excavations. When working in excavations a banksman is to be present at all times.

Potential Impact

Mitigation Measure

Monitoring

Grid Connection Corridor: HDD in avoidance areas:

- a) A set of avoidance areas (as shown on **ES Volume 3: Appendix 2-B (Figure 1) [EN010131/APP/3.3]**) have been assigned along within the Grid Connection Corridor where watercourses would be crossed by a HDD methodology rather than intrusive, open-cut techniques.
- b) Launch and exit pits will be sited outside the avoidance areas, and a minimum of 10m from watercourses (measured from the centre line of the watercourse as discussed above with the exception of the River Trent) and a minimum of 16m from the toe of flood defences. Each pit would be a maximum of 5m length x 5m width x 3m depth.
- c) A shoring system appropriate to the ground conditions would be used as appropriate to minimise water ingress into the pits. This may be timbers, sheet piling, or a modular system and would be chosen based on suitability for the site conditions. The ingress of any groundwater will be carefully managed through design of the send or receive pit, shoring method, and a pumping and treatment system. Excessive ingress of water would make the pit unsafe and thus it is important that ingress is minimised and that a suitable system of managing that water is implemented.
- d) The maximum depth of drilling will be under the River Trent and would be up to a maximum of 25m beneath the bed. For all watercourses the depth of drilling beneath the watercourse bed would be a minimum of 2m, in keeping with IDB requirements.
- e) In addition to the control and management measures for site runoff and spillage risk noted above, the methodology of the drilling, or other trenchless techniques, would include measures to minimise the risk to the environment.
- f) A site-specific hydraulic fracture (frac-out) risk assessment would be developed prior to construction following further investigation of specific ground conditions at the crossing locations, and appropriate mitigation developed in line with best construction practice.
- g) Once the cable is installed beneath the watercourse the pits and any cable trenches will be backfilled to the original ground level and seeded to reduce the risk of runoff and fine sediments entering the watercourse.

Potential Impact

Mitigation Measure

Monitoring

- h) Directional drilling, or other trenchless techniques, would be undertaken by a specialist contractor and the water column above the drill path would be continuously monitored during drilling.

Grid Connection Corridor: Management of Risk to Morphology of Waterbodies from Open-Cut Crossings

- a) For the open cut sections of the Grid Connection Corridor, a maximum 25m wide construction corridor will include a single trench within which the 400kV connection will be installed. The 25m construction corridor will also include a running track along which vehicles and plant will be located as well as an area for temporary storage of excavated spoil (taking into account the necessary 10m buffer from watercourses).
- b) A pre-works morphology survey of the channel of each watercourse to be crossed will be undertaken prior to construction.
- c) At this stage it is assumed that where open-cut crossings are required that water flow would be maintained by damming and over pumping. Works should be carried out in the drier months where practicable as this would reduce the risk of pollution propagating downstream, particularly given that these watercourses are considered ephemeral. Once the watercourses are reinstated, silt fences, geotextile matting, or straw bales should be used initially to capture mobilised sediments until the watercourse has returned to a settled state.
- d) Watercourses are reinstated as found and water quality monitoring will be undertaken prior to, during, and following on from the construction activity.
- e) Regular observations of the watercourses will also be required post-works during vegetation re-establishment of the banks, especially following wet weather, to ensure that no adverse impacts have occurred.

Access Track Crossings of Watercourses

- a) Access tracks will adhere to the appropriate 10m buffer from watercourses and ponds as outlined above, except where crossings are required. Buffers from Upper Within IDB Watercourses (Padmoor Drain and Causeway Drain) would be 9m, measured from the top of the bank.

Potential Impact	Mitigation Measure	Monitoring
	<ul style="list-style-type: none"> b) Where a new drainage ditch crossing is required, both a new culvert and an open span bridge crossing will be considered, with the type of crossing selected being determined based on site specific factors and in consultation with the relevant authority (generally the IDB/LLFA for the Solar and Energy Storage Park Site). c) Where new culvert structures are required (temporary or permanent), these would be designed appropriately to maintain connectivity along watercourses for aquatic species and riparian mammals, where these are shown to be present. All culverts to convey watercourses will be set 150mm below bed level to allow sedimentation and a naturalised bed to form, which will maintain longitudinal connectivity for aquatic fauna. d) Depending on the design of any watercourse crossings, floodplain compensation may be required on a 'like for like' and 'level for level' basis. Alterations to surface water flow pathways will also need to be considered and, if necessary, mitigated. This will include consideration of the span and soffit height of any works to existing crossings to ensure no increase in flood risk. As agreed with the Environment Agency, a Water Framework Directive (WFD) Strategy will be included as an appendix to the detailed CEMP. e) Tracks should be permeable, and localised SuDS, such as swales and infiltration trenches, should be used to control runoff. Should there be any need for culverts identified that is unavoidable then equivalent watercourse improvement would be provided (i.e. on a length for length basis). 	

Table 3-5 Landscape and Visual Amenity

Potential Impact	Mitigation Measure	Monitoring
Visual Impacts on receptors	<p>Screening</p> <p>New planting proposed as part of the Scheme is detailed in the Outline LEMP [EN010131/APP/7.10]. The planting would be delivered in 2 phases:</p> <p>Early planting in order to maximise growth prior to the Scheme's operation, this has been included as Advanced Planting in Figure 10-22: Advanced Planting Plan of the ES</p>	<p>Monitoring of screening is detailed in the Outline LEMP [EN010131/APP/7.10].</p>

Potential Impact

Mitigation Measure

Monitoring

[EN010131/APP/3.2]. This will be carried out at the next available planting season and prior to the beginning of the construction phase; and Residual Mitigation Planting (remaining planting) would be undertaken at the end of the construction phase.

Vegetation Buffers

The following minimum offsets / buffer from existing vegetation boundaries have been incorporated:

- a) 15m from Ancient Woodland,
- b) 15m from retained existing woodland and tree groups;
- c) 10m from hedgerows with trees;
- d) 5m from hedgerows without trees;
- e) 10m from proposed or strengthened hedgerows with trees; and
- f) 10m from retained existing ponds to be enhanced with remedial vegetation clearance and proposed bankside grassland.

Lighting

Lighting would be in the form of mobile lighting towers used where natural light is unable to reach (sheltered or confined areas) and during core working hours (Monday – Saturday: 08.00-18.00) during winter months. Lights would be fitted with downward directional fittings to minimise light spill and glare. Lights would be directed into the Order limits, not towards the boundary. Motion detection security lighting will also be used to avoid permanent lighting.

Site Management

Ensuring a tidy and neat working area, covering stockpiles, and storing topsoil in accordance with good practice measures as detailed in Table 3-4: Water Environment (above).

Monitoring will be provided in the detailed CEMP(s)

Table 3-6 Noise and Vibration

Potential Impact	Mitigation Measure	Monitoring
<p>Vibration due to construction activities potentially causing annoyance at Noise Sensitive Receptors and damage to building structures</p>	<p>A communication strategy will be developed to include:</p> <ul style="list-style-type: none"> a) Noise complaints will be monitored and reported to the Applicant for immediate investigation and action; b) A display board will be installed on-site, and a website will be set up. These will include contact details for the Community Liaison Officer or alternative with whom nuisances or complaints can be lodged; and c) A logbook of complaints will be prepared and managed by the Site Manager. 	<p>A construction noise monitoring scheme will be developed in the CEMP(s). The Environmental Manager will regularly record compliance in a logbook.</p> <p>The detailed CEMP(s) will set out a scheme for the provision of monthly reporting information to and local residents to advise of potential noisy works that are due to take place and for monitoring of noise complaints and reporting to the Applicant for immediate investigation and action.</p>
<p>Impacts to nearby residents</p>	<p>Standard Working Hours</p> <p>Summer: 07:00 – 19:00 Monday to Friday and Saturday 09:00-13:00 with no Sunday or Bank Holiday working.</p> <p>Winter: 08:00 – 18:00 Monday to Friday and Saturday 09:00-13:00 with no Sunday or Bank Holiday working.</p> <p>Some works activities may need to occur out of these hours/times due to activities requiring to be undertaken continuously (such as HDD and cable jointing). Where work outside of times is necessary prior notification will be provided to the LPA.</p>	<p>Contractor to implement.</p>
<p>Disturbance during night-time operations for HDD</p>	<ul style="list-style-type: none"> a) As requirements and locations for HDD activities will not be finalised until contractor is appointed, a hierarchy of mitigation measures is listed below: 	<p>The contractor will submit an application for prior</p>

Potential Impact	Mitigation Measure	Monitoring
	<ul style="list-style-type: none"> b) Where practicable, avoid HDD works within 200m of residential receptors; c) Where HDD activities may occur within 200m of sensitive receptors, the option for open cut cable laying will be explored as an alternative to HDD; d) The potential use of quieter equipment will be explored by the principal contractor; and e) Depending on location, plant and timing of works, noise matting will be installed on Heras fencing around the HDD site boundary to screen receptors from noise emissions. This mitigation could provide 10 dB of attenuation when the noise screen completely hides the sources from the receiver. f) If the HDD activities result in noise at nearby sensitive receptors that is predicted to exceed the night-time SOAEL of 55 dB LAeq,T , acoustic fencing would be used to screen the affected receptor from HDD noise and reduce noise levels to below the SOAEL. 	<p>consent to carry out noisy work under Section 61 of the Control of Pollution Act 1974 (CoPA) to demonstrate that noise and vibration has been minimised as far as reasonably practicable.</p>
<p>Impacts from increase in traffic</p>	<p>Consideration has been given to traffic routing, timing, and access points to the Scheme to minimise noise impacts at existing receptors. Management of Heavy Goods Vehicles (HGV) on the highway network will be managed through the Framework Construction Traffic Management Plan (CTMP) (ES Volume 3: Appendix 13-E [EN010131/APP/3.3]).</p>	<p>See Framework Construction Traffic Management Plan (CTMP) [EN010131/APP/3.3].</p>
<p>Volumes of noise that may cause public disturbance during construction operations</p>	<p>Practises used to minimise volume of noise produced:</p> <ul style="list-style-type: none"> a) Ensuring that all appropriate processes, procedures and measures are in place to minimise noise before works begin and throughout the construction programme; b) All contractors to be made familiar with current legislation and the guidance in BS 5228 (Parts 1 and 2) Code of practice for noise and vibration control on construction and open sites which should form a prerequisite of their appointment; c) Where reasonably practicable, noise and vibration are controlled at source, review of the construction programme and methodology to consider quieter methods, consideration of the location of equipment on-site and control of working hours; d) Use of modern plant, complying with applicable UK noise emission requirements; e) Hydraulic techniques for breaking concrete or rocks to be used in preference to percussive techniques, where reasonably practicable; f) Drop height of materials will be minimised; 	<p>The detailed CEMP(s) will provide any monitoring required.</p>

Potential Impact	Mitigation Measure	Monitoring
	<ul style="list-style-type: none"> g) Plants and vehicles will be sequentially started up rather than all together; h) Off-site pre-fabrication where reasonably practicable; i) Use of screening locally around significant noise producing plant and activities; j) Regular and effective maintenance by trained personnel will be undertaken to keep plant and equipment working to manufacturer's specifications; k) All construction plant and equipment must be properly maintained, silenced where appropriate, operated to prevent excessive noise and switched on when not in use; l) Loading and unloading of vehicles, dismantling of site equipment, or moving equipment or materials around the Order limits to be conducted in such a manner as to minimise noise generation as far as reasonably practicable; m) All vehicles used on-site shall incorporate reversing warning devices as opposed to the typical tonal reversing alarms to minimise noise disturbance where reasonably practicable; n) Provision of information to the relevant local authority and local residents to advise of potential noisy works that are due to take place; o) Unnecessary revving of engines will be avoided, and equipment will be switched off when not in use; and p) Plant will always be used in accordance with manufacturers' instructions. Care will be taken to site equipment away from noise-sensitive areas. where reasonably practicable, loading and unloading will also be carried out away from such areas. 	

Table 3-7 Socio-Economics and Land-Use

Potential Impact	Mitigation Measure	Monitoring
<p>Potential for damage to soil. Causing soil compaction by carrying out works in inappropriate (wet) conditions could reduce infiltration potentially enhancing any run-off and/or erosion issues. If compacted the land maybe of lower quality on decommissioning.</p>	<p>Prior to commencement of works a Soil Management Plan (SMP) will be prepared in accordance with the Outline Soil Management Plan (Outline SMP). The SMP will detail the management of soil on areas such as temporary working compounds, temporary and permanent tracks and sites of temporary and permanent buildings. The SMP will include details of topsoil and subsoil stripping depths, how and where soils will be stored, conditions under which soil stripping and reinstatement will be carried out and how the reinstatement will be carried out.</p>	<p>The SMP will detail any soil monitoring to be undertaken.</p>

Potential Impact	Mitigation Measure	Monitoring
	<p>An ALC survey within the Grid Connection Corridor area will be undertaken prior to construction. The survey will characterise soil condition and properties. The results will inform the pre-construction Soil Management Plan (SMP) that will be prepared for any areas to be disturbed to ensure correct handling and restoration of soils.</p> <p>The Outline SMP and SMP will follow the principles of best practice including the Defra (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites. and The Institute of Quarrying (2021) Good Practice Guide for Handling Soils in Mineral Workings.</p>	
Disruption to local residents, businesses and community facilities	<p>Primary mitigation measures are embedded within the Scheme, as set out in the respective chapters, to reduce other construction and operational effects (such as noise, air quality, 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.</p> <p>Measures to mitigate the effects of construction noise are outlined in Table 3-6.</p> <p>Measures to mitigate the effects of visual impacts from construction are outlined in Table 3-2.</p> <p>Measures to mitigate the effects of construction traffic are outlined in Table 3-8.</p> <p>Measures to mitigate the effects of construction on air quality are outlined in Table 3-13.</p>	

Table 3-8 Transport and Access

Potential Impact	Mitigation Measure	Monitoring
<p>Increased traffic flows, including HGVs on the roads leading to the Order limits.</p> <p>Severance and intimidation associated with increased construction traffic and abnormal loads.</p>	<p>The Framework CTMP (ES Volume 3: Appendix 13-E [EN010131/APP/3.3]) sets out measures to manage construction traffic within the vicinity of the Order limits along the local highway network during the construction period of the works, in order to limit any potential disruptions and implications on the wider transport network, as well as for the existing road users. It identifies the management of freight traffic i.e. Heavy Goods Vehicles (HGVs), as</p>	<p>There will be monitoring of HGVs, staff vehicles travelling to and from the Order limits, together with safety monitoring at specific locations, as</p>

Potential Impact	Mitigation Measure	Monitoring
	<p>well as staff vehicles. Full details will be provided in the final CTMP which will be secured by a DCO Requirement.</p> <p>An Outline Public Rights of Way Management Plan [EN010131/APP/7.8] sets out how Public Rights of Way (PRoW) will be managed to ensure they are safe and accessible during construction. A detailed Public Right of Way Management Plan will be secured by a DCO Requirement.</p> <p>Temporary signage will be installed in the verge to provide advance warning to motorists of construction traffic turning.</p>	<p>detailed in the Framework CTMP.</p>
<p>Damage to the road network during the construction phase.</p>	<p>Carrying out road condition surveys pre-construction, during construction and post-construction, to identify any defects that arise to the highway's assets/verges during the construction phase of the Scheme for re-instatement.</p>	
<p>Potential Cumulative Effects with Cottam and West Burton solar projects Schemes on the Grid Connection Corridor</p>	<p>A combined Construction Traffic Management Plan (CTMP) will be prepared that will identify combined construction traffic planning, management and mitigation measures. The opportunity to combine mitigation (including some of the above measures) for the West Burton Solar Project and Cottam Solar Project schemes will be explored in order to reduce cumulative impacts during the construction phase. This could include sharing the shuttle service to transport construction workers to/ from multiple sites or sharing construction compounds to consolidate trips.</p>	<p>Further details will be set out within the Detailed CTMP(s) once further details in relation to the Cottam and West Burton solar projects are known.</p>

Table 3-9 Glint and Glare

Potential Impact	Mitigation Measure	Monitoring
<p>Potential to impact on residential and road receptors</p>	<p>Provide additional hedgerow planting to reduce glint and glare effects on residential and road receptors. This includes hedgerows to be grown, infilled, gapped up and maintained to a height of at least 3m in those areas indicated in the Outline LEMP [EN010131/APP/7.10].</p>	<p>Monitoring of hedgerows is provided in Outline LEMP [EN010131/APP/7.10].</p>

Table 3-10 Telecommunications, Television Reception and Utilities

Potential Impact	Mitigation Measure	Monitoring
Potential to affect existing utility infrastructure above and below ground	<p>The risk of damage to utilities during construction will be minimised through mitigation, which will involve:</p> <ul style="list-style-type: none"> a) Locating the Scheme outside of utilities' protected zones; b) The use of ground penetrating radar or other appropriate techniques will be employed before excavation to identify any unknown utilities. c) Consultation and agreement of construction/demobilisation methods will be undertaken prior to works commencing (this would be covered by the protective provisions included in the DCO). d) Infrastructure that crosses the Scheme will be mapped and avoided through the design. 	No monitoring required.

Table 3-11 Waste

Potential Impact	Mitigation Measure	Monitoring
Potential to impact on sensitive receptors (humans, wildlife, and controlled waters) if not stored and managed appropriately.	The contractor(s) will consider the objectives of sustainable resource and waste management and seek to use material resources efficiently, reduce waste at source, reduce waste that requires final disposal to landfill and apply the principles of the waste hierarchy. This would include, where practicable, working towards a cut and fill balance for excavations, segregation of construction materials on-site for appropriate re-use, recycling and recovery, with landfill as a last resort.	The types, quantities and destination of waste generated during the construction phase would be identified, measured and recorded through the Site Waste Management Plan (SWMP).
Impacts of waste on the surrounding environment	Use of off-site pre-fabrication will be used, where feasible including the use of prefabricated structural elements, cladding units, mechanical and electrical risers and packaged plant rooms. Burning of waste or unwanted materials will not be permitted on-site. All hazardous materials including chemicals, cleaning agents and solvent containing products to be properly sealed in sealed containers at the end of each day prior to storage in appropriately protected and bunded storage areas. Materials requiring removal from the Order limits would be transported using licensed carriers and records kept, detailing the types and quantities of waste moved and the destinations of this waste, in accordance with the relevant regulations.	A register of all 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,

Potential Impact	Mitigation Measure	Monitoring
		and management methods.

Table 3-12 Major Accidents and Disasters

Potential Impact	Mitigation Measure	Monitoring
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. The relevant risk assessments for safety during construction will be required and produced by the contractor prior to construction, which will be implemented to minimise the risk of accidents and disasters on site.		

Table 3-13 Air Quality

Potential Impact	Mitigation Measure	Monitoring
Increased nitrogen dioxide (NO ₂) and particulate matter (PM ₁₀) from on-site and off-site construction vehicle/plant emissions. Increased particulates and deposited dust from Site activities, materials transportation, storage and handling, including use of haul roads.	Appropriate mitigation and control measures will be included in the detailed CEMP(s), which would include: Communications: a) Develop and implement a stakeholder communications plan that includes community engagement before work commences on-site; b) Display the name and contact details of person(s) accountable for air quality and dust issues on-site. This may be the environment manager/engineer or site manager; c) Display the head or regional office contact information; and d) Develop and implement a Dust Management Plan, which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include, as a minimum, the highly recommended measures. The desirable measures should be included as appropriate for the site. The DMP will need to include monitoring of dust deposition, dust flux, real time PM continuous monitoring and/or visual inspection.	Measures in the detailed CEMP(s) will include the implementation of: - Inspection procedures at the Order limits boundary to periodically visually assess any dust and air pollution which may be generated - Inspection of maintenance schedules for construction vehicles, plant and machinery; and - Inspection and recording procedures relating to the

Potential Impact

Mitigation Measure

Monitoring

Site Management:

- a) Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measure taken;
- b) Make the complaints log available to the local authority when asked;
- c) Record any exceptional incidents that cause dust and/or air emissions, either on-site or offsite, and the action taken to resolve the situation in the logbook;
- d) Hold regular liaison meetings with other high-risk construction sites within 500m of the Site (if applicable), to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes;
- e) Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection local available to the local authority when asked;
- f) Increase the frequency of site inspections by the person accountable for air quality and dust issues when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions;
- g) Plan site layout so that machinery and dust causing activities are located away from receptors, where practicable.

level of traffic movements, use and condition of haul routes.

Preparing and Maintaining the Site:

- a) Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on-site where stockpiles (if required) are within 100m of receptors;
- b) Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period where operations are within 100m of receptors;
- c) Avoid site runoff of water or mud;
- d) Keep site fencing, barriers and scaffolding clean using wet methods;
- e) Remove materials that have a potential to produce dust from the Site as soon as practicable, unless being re-used on-site. If they are being re-used on-site cover them; and
- f) Cover, seed or fence stockpiles to prevent wind whipping.

Potential Impact

Mitigation Measure

Monitoring

Operating Vehicles / Machinery and Sustainable Travel:

- a) Ensure all vehicles switch off engines when stationary - no idling vehicles;
- b) Ensure all diesel- or petrol-powered generators are fully maintained and used for the minimum periods only. Transition to mains electricity or battery powered equipment where practicable;
- c) Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate);
- d) Produce a Constructive Logistics Plan as part of the CTMP to manage the sustainable delivery of goods and materials; and
- e) Implement a Travel Plan that supports and encourages sustainable travel.

Operations:

- a) Only use cutting, grinding, or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g.: suitable local exhaust ventilation systems;
- b) Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where practicable, and appropriate; and
- c) Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management:

- a) Avoid bonfires and burning of waste materials.

Earthworks:

- a) Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- b) Use Hessian, mulches or tackifiers where it is not practicable to re-vegetate or cover with topsoil, as soon as practicable; and
- c) Only remove the cover in small areas during work and not all at once.

Potential Impact

Mitigation Measure

Monitoring

Construction:

- a) Avoid scabbling (roughing of concrete surfaces) if practicable;
- b) Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- c) Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery; and
- d) For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to store dust.

Trackout:

- a) Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- b) Avoid dry sweeping of large areas;
- c) Ensure vehicles entering and leaving site are covered to prevent escape of materials during transport;
- d) Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- e) Record all inspections of haul routes and any subsequent action in site logbook;
- f) Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned;
- g) Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- h) Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and
- i) Access gates to be located at least 10m from receptors where practicable.

Table 3-14 Arboriculture

Potential Impact	Mitigation Measure	Monitoring
Access locations impacting trees	<ul style="list-style-type: none"> a) Access tracks will be micro-sited to avoid the Root Protection Area (RPA) of all veteran trees; a) The secondary access along Kexby Lane North is positioned directly adjacent to a potentially high quality, mature oak located just north of an existing drainage ditch. Any upgrade to the ditch crossing will be micro-sited beyond the RPA of this tree but if the detailed design cannot avoid the RPA, specialist construction methodologies will be utilised to avoid negative impacts to the physiological or structural condition of the tree. 'No dig' principles can be achieved with the use of a three-dimensional load bearing surface that is designed to meet the highest expected loads and is positioned on top of the existing ground level. The use of ground protection boards might be a suitable alternative where specified to accommodate the highest expected loads into the compound area and wider site beyond; b) Marton Road access utilises the position of an existing farm access and as such does not incur within the constraints of any trees. However, this access is single track and if to be upgraded it has the potential to impact on trees within the adjacent recreation ground. Again, where the RPAs of adjacent trees cannot be avoided specialist construction methodologies, as detailed above, will be utilised; c) A number of trees have the potential to be impacted by new access routes including the following trees identified as veteran. In these cases, the access track will be micro-sited to ensure all ancient and veteran trees are fully protected; d) Other potential impacts to non-veteran trees due to the upgrading of existing tracks or the positioning of new routes have been highlighted on the Tree Preservation and Removal Proposal (TPRP) including T23 and W46 categorised as high quality (Category A), a number of moderate quality (Category B) tree features and some additional tree features not captured in the detailed survey but identified in the NTM data. New access tracks will be positioned to avoid all retained tree RPAs. Where existing access tracks are proposed to be upgraded within the RPAs of retained trees specialist construction methodologies will be required. 	The detailed CEMP(s) will provide any monitoring required.
Proposed security fencing and cameras	<ul style="list-style-type: none"> a) It might not be possible to fully avoid tree constraints during the installation of security fencing. In these cases, the fence should be micro-sited to avoid tree stems, particularly of moderate and high value trees with receiving pits for fence posts excavated by hand. 	

Potential Impact

Mitigation Measure

Monitoring

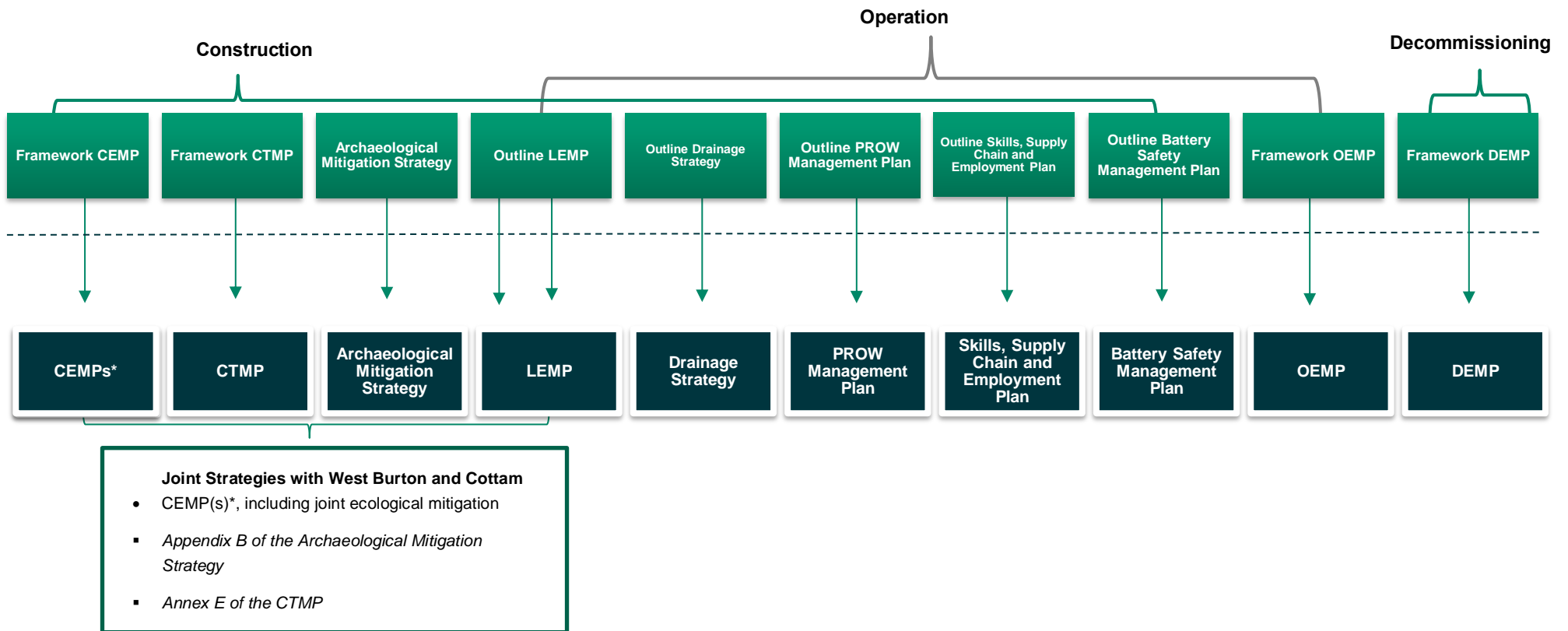
Potential Impact	Mitigation Measure	Monitoring
	<ul style="list-style-type: none"> b) Methodologies (such as excavation by hand and localised adjustment of fencepost positions) will be agreed at the detailed design stage and an Arboricultural Method Statement developed. 	
Tree Protection	<ul style="list-style-type: none"> a) The default position is that the RPA and canopy spread of trees to be retained will form an effective Construction Exclusion Zone, secured with robust fencing where no access will be permitted. Where access is necessary within this area special measures such as the use of ground protection and arboricultural supervision are generally required; b) Tree protection method will be adhered to as set out in Appendix B; c) A minimum 15m buffer zone has been applied to the ancient woodland boundary; d) All ancient and veteran trees or trees subject to a TPO will be retained and are fully protected except where TPOs are in place for trees which are no longer present, are dead or are no longer worthy of TPO status, and impact or removal is required. Approval of the Local Planning Authority will be obtained in advance as part of pre-construction planning e) Burton Wood will not be impacted by the Scheme and all infrastructure shown on the TPRP, such as new access tracks, will be micro-sited to avoid the 15m buffer zone; f) A verification survey will be carried out during the detailed design to confirm the conclusions of this Arboricultural Impact Assessment remain valid prior to the start of construction and to identify all veteran (or ancient) trees within the Order limits that need to be protected. No development or works will take place in the RPA/buffer zone (determined as 15x stem diameter or canopy +5m – whichever is greater) of any veteran tree should additional veteran trees be identified within the Order limits; g) Avoidance of trees within the Avoidance Areas where the haul road will be installed and utilise trackway where practicable, to minimise ground disturbance. Trackway must be suitable to avoid root limiting compaction of the soil based on the highest anticipated load where the haul road enters any RPA. 	
Tree planting	<ul style="list-style-type: none"> a) New tree planting should be implemented in accordance with the guidance set out in BS8545: 2014 Trees: from nursery to establishment in the landscape – Recommendations; and b) Where new trees are to be planted, the minimum planting distances detailed in Annex A, Table A.1 of BS5837:2012: Trees in Relation to Design, Demolition and 	

Potential Impact	Mitigation Measure	Monitoring
	<p>Construction to Construction - Recommendations must be adhered to, to prevent direct damage to services and structures from future tree growth.</p> <p>c) Existing areas of unsurfaced ground must be protected if they are to be re-used for new plantings. Protection can be achieved using fit for purpose ground protection measures as set out in BS5837:2012 Section 6.2.3 or by creating a fenced exclusion zone. Where protection is not feasible, soil amelioration or replacement works will be required to ensure suitable growing conditions for new trees to fully establish.</p>	
<p>Site Organisation, Storage and Use of Materials, Plant and Machinery</p>	<p>a) The storage of materials and any washing, mixing or refuelling will take place in agreed allocated areas at least 5m from the edge of the RPA of retained trees;</p> <p>b) Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs; and</p> <p>c) Particular care is required where high sided vehicles, long reach machinery and plant with jibs, booms and counterweights are to operate with in proximity to retained trees. A banksman will be used where the movement of plant or long reach machinery occurs within 5m of any part of a retained tree to ensure no damage is sustained.</p>	

4. Complementary Plans and Procedures

- 4.1.1 A suite of complementary environmental plans and procedures have been included within the DCO Application and set out proposed mitigation for the construction phase, and in some cases the operational phase.
- 4.1.2 These documents include:
- Draft Archaeological Mitigation Strategy **[EN010131/APP/7.6]**;
 - Outline Skills, Supply Chain and Employment Plan ('OSSCEP') **[EN010131/APP/7.7]**;
 - Framework Construction Traffic Management Plan (CTMP), including a Travel Plan (**ES Volume 3: Appendix 13-D [EN010131/APP/3.3]**);
 - Outline Landscape and Ecology Management Plan (OLEMP) **[EN010131/APP/7.10]**;
 - Outline Soils Management Plan (SMP) **[EN010131/APP/7.12]**;
 - Outline Public Right of Way (PRoW) Management Plan **[EN010131/APP/7.8]**; and
 - Outline Battery Safety Management Plan **[EN010131/APP/7.1]**.
- 4.1.3 The suite of management plans is illustrated in Plate 1 overleaf. Where the specific details of the mitigation are yet to be determined, further detailed plans will be developed alongside the CEMP.

Plate 1. Gate Burton Management Plans



*CEMPs will include detailed issue-specific plans such as dust management plans, water management plans, biosecurity management plans etc.

5. Implementation and Operation

- 5.1.1 The detailed CEMP(s) will set out roles, responsibilities and actions required in respect of implementation of the measures described in this Framework CEMP, 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.
- 5.1.2 The Construction Project Manager and Environmental Manager have responsibility for ensuring compliance with the Framework CEMP and detailed CEMP(s).

6. Monitoring and Reporting

6.1 Monitoring

- 6.1.1 Monitoring and reporting will be undertaken for the duration of the construction phase in order to demonstrate the effectiveness of the measures set out in the detailed CEMP(s) and related construction controls and allow for corrective action to be taken where necessary.
- 6.1.2 As part of the monitoring process the contractor will allocate a designated Environmental Manager, who will be present on site throughout the construction process and when new activities are commencing. The Environmental Manager will observe site activities and report any deviations from the CEMP(s), along with the action taken and general conditions at the time. The Applicant will be informed of any deviations from the CEMP(s) as soon as practicable following identification of such issues. The Environmental Manager will also act as day-to-day contact with relevant authorities and other regulatory agencies, such as the Environment Agency.
- 6.1.3 During construction, the Environmental Manager will conduct walkover surveys to ensure all requirements of the CEMP(s) are being met. Action from these surveys will be documented on an Environmental Action Schedule, discussed with the Construction Project Manager for programming requirements and issued weekly for actioning.
- 6.1.4 The Environmental Manager and / or the Construction Project Manager will arrange regular formal inspections to ensure the requirements of the CEMP(s)

are being met. Details of monitoring, inspection, and audits to be undertaken will be provided in the CEMP(s). After completion of the works, the Environmental Manager will conduct a final review.

- 6.1.5 A Community Liaison Group will be set up prior to construction and a Community Liaison Officer will be appointed to lead discussions with local communities during construction. Contact details will also be available on the display board at the site entrance should anyone wish to make contact.

6.2 Records

- 6.2.1 The Environmental Manager / Construction Project Manager will retain records of all environmental monitoring and implementation of the CEMP(s). This will allow provision of evidence that the CEMP(s) is being implemented effectively. These records will include:
- a) Results of routine site inspections;
 - 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 approved CEMP(s) or complaints received from a third party.
- 6.2.2 The CEMP(s) will be updated as necessary to include additional control measures, with a full review as required throughout the construction period. Existing control measures and mitigation will not be amended without prior agreement with the local authorities.
- 6.2.3 The CEMP(s) will be signed off by an appropriately qualified person(s) on completion of the construction works.

7. References

- Ref. 1 HMSO. (1981). Wildlife & Countryside Act 1981.
<https://www.legislation.gov.uk/ukpga/1981/69>.
- Ref. 2 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017).
- Ref. 3 HMSO (2008) The Planning Act 2008.
- Ref. 4 British Standards Institute (2009) BS6031:2009 Code of Practice for Earth Works
- Ref. 5 British Standards Institute (2013) BS8582 Code of Practice for Surface Water Management of Development Sites.
- Ref. 6 CIRIA C741 (2015) Environmental good practice on site guide (fourth edition).
- Ref. 7 CIRIA C648 (2006) Control of water pollution from linear construction projects, technical guidance.
- Ref. 8 CIRIA C609 (2004) Sustainable Drainage Systems, hydraulic, structural and water quality advice.
- Ref. 9 CIRIA C532 (2001) Control of water pollution from construction sites – Guidance for consultants and contractors.
- Ref. 10 CIRIA C736F (2014) Containment systems for prevention of pollution.
- Ref. 11 CIRIA (2016) Report C753 The SuDS Manual 2nd Edition.
- Ref. 12 NetRegs.Environmental Guidance for your Business in Northern Ireland and Scotland [Online].
- Ref. 13 Environment Agency. Pollution Prevention Guidelines. Working at construction and demolition sites: PPG6.
- Ref. 14 Environment Agency. Pollution Prevention Guidance. Safe storage – the safe operation of refuelling facilities: PPG7.
- Ref. 15 Environment Agency. Pollution Prevention Guidance. Managing Fire Water and Major Spillages: PPG18.

Appendix A. Outline Risk Assessment Methods (RAMs)

A.1 Great Crested Newt

To mitigate against harm to any amphibians present, the following precautionary methods of working are deemed appropriate for the works within 250m of the pond supporting Great Crested Newt.

A finger-tip search for Great Crested Newt will be undertaken within areas of suitable Great Crested Newt habitat, within 250m of a pond supporting this species. Following this, habitat manipulation will be overseen by a suitably qualified ecologist (SQE) acting as an Ecological Clerk of Works (ECoW) and will comprise the following general principles:

- a) The on-site vegetation within the areas of habitat suitable for Great Crested Newt will be cut short during winter, between November and February (when amphibians are hibernating). If this is not possible (i.e. vegetation clearance during the Great Crested Newt active season), the vegetation will be cut in a phased approach, firstly cutting to 30cm, then, following a period of no less than 24 hours, can be cut to 15cm and then to ground level, after another 24 hours.
- b) The vegetation will then be kept short to displace any amphibians, which may be present, away from the works when they emerge in the early spring and discourage amphibians from moving into the Order limits from the surrounding habitat.
- c) Vegetation (including topsoil) will be carefully removed using an excavator using a toothed bucket. These works will be supervised by an SQE.
- d) Any habitat features which may conceal hibernating amphibians (log piles, rubble mound bunds, any other debris etc.) will not be dismantled during winter months (between November and February) and will be conducted during the amphibian active season (i.e. March (dependent on weather) to October) during warm weather conditions (i.e. above 5°C) to avoid killing or injuring potential hibernating amphibians.

In the unlikely event that any Great Crested Newt are discovered during these works, then such works must cease immediately and a SQE must be consulted to determine how to proceed. If other amphibians are discovered during vegetation clearance it is proposed that these are relocated to suitable habitat nearby in suitable weather conditions.

A.2 Reptiles and Other Amphibians

To mitigate for potential incidental killing or injury of animals and for the loss of reptile and other amphibian habitat (excluding Great Crested Newt, see measures above), the following outline mitigation is proposed:

- a) Retention of the majority of habitats (such as grassland and water bodies) supporting reptiles and other amphibians, within the Solar and Energy Storage Park, with limited intrusion into these areas during construction;

- b) Clearance of grassland vegetation from areas where reptiles and other amphibians were identified, under ecological supervision to reduce the suitability of habitat for reptiles and amphibians; and
- c) Avoidance of construction through potential hibernation areas within the Site.

Retention of habitat

Where practicable, the majority of grassland in the Site will be retained. Where any such habitat supporting reptiles and other amphibians (as identified through baseline ecological surveys) will be removed, due to construction of the Scheme, then appropriate mitigation will be required (see below) to avoid unintentional killing or injury to reptiles. All water bodies in the Site will be retained.

Vegetation clearance to minimise potential for incidental injury or mortality to reptiles and amphibians

The construction of the Scheme will potentially lead to temporary loss of grassland habitat, supporting very low numbers of reptiles and other amphibians, although these will be retained and avoided as much as is practicable. Therefore, any habitat loss in areas where reptiles and other amphibians were identified will be managed, through vegetation clearance, to temporarily reduce the suitability of the habitat and encourage reptile dispersal away from the construction areas.

The exact prescription of works will be dependent on the time of year within which the construction works will be undertaken and in consideration of how reptiles and amphibians will be affected during their life cycle.

Broadly, the vegetation management will comprise:

- a) Strimming grassland vegetation within the Grid Connection Corridor and the Solar and Energy Storage Park; and
- b) Removal of arisings from these areas.

The vegetation will be cleared to ground level, using hand trimmers, under the supervision of an Ecological Clerk of Work (ECoW). The vegetation will be cut in two passes, with the first cut of the vegetation cutting to no less than 0.3m (1 foot) from above ground level. After a period of no less than 24 hours, a second cut of the vegetation will be made to ground level.

Vegetation strimming will be undertaken during suitable weather conditions, when the weather conditions are dry, with little to no wind and the temperature is between 9°C and 20°C.

All arisings will be raked by hand and removed from Site to prevent potential usage by reptiles.

Where practicable, the vegetation clearance should be undertaken during September and October. This clearance is inside the active reptile season (March to October), but outside of the breeding bird season, which is typically March to August inclusive.

Avoidance of hibernating reptiles and amphibians

If construction works, including ground clearance works, are undertaken between November and early March, then these works are likely to affect reptiles during their hibernation period, when reptiles are typically below ground. Reptiles usually hibernate between October/November and March, although this can vary as reptile activity is highly influenced by weather conditions and hibernation is triggered by a response to temperature fluctuations above ground. Hibernation spots for reptiles includes rubble piles, log piles and under large rocks.

Therefore, supervision by an ECoW of intrusive ground works on the Solar and Energy Storage Park and Grid Connection Corridor will be undertaken to locate any areas of hibernacula, or potential hibernacula. Any such areas of hibernacula, or potential hibernacula, will be avoided, where construction occurs during winter months and when reptiles are hibernating. Reptile activity is highly influenced by weather conditions and hibernation is triggered by a response to decreasing temperatures above ground. Typically, the hibernation period for reptiles is October / November to March, although this can vary depending on the weather.

Alternatively, potential hibernation spots could be removed in advance of construction, within the reptile active period and replaced outside of the Scheme area (but within a suitable distance so that reptiles can find it). Removal would be under the supervision by an ECoW.

Any habitat features which may conceal hibernating amphibians (log piles, rubble mound bunds, any other debris etc.) will not be dismantled during winter months (between November and February) and will be conducted during the amphibian active season (i.e. March (dependent on weather) to October) during warm weather conditions (i.e. above 5°C) to avoid killing or injuring potential hibernating amphibians.

A.3 Breeding Birds

Where vegetation clearance is undertaken within the bird nesting season (i.e. between 1st March and 31st August), then a detailed inspection for nesting birds within all scrub and trees will be carried out by a suitably qualified ecologist no more than 24 hours prior to any vegetation clearance being undertaken. If an active nest is identified, a suitable exclusion zone, the extent of which will be determined by the species nesting and stage of nesting (e.g. eggs, chicks) will be established around the nest. Typically, this buffer will be between 10m and 200m (dependent on the species). No works will take place within the exclusion zone until a suitably qualified ecologist confirms (through regular monitoring) that chicks have fledged, and the nest is no longer active.

If, during the construction phase, any parts of the worksite are left dormant for one week or more between February and mid-August inclusive, a suitably qualified ecologist will check for the presence of nesting birds before works recommence. If any active nests are found, construction will cease, and an appropriate buffer zone will be established (as above).

A.4 Badger Pre-construction

As Badgers are nomadic and can use disused setts (making them active again), a pre-construction survey will be undertaken to appraise activity levels of all the setts

identified as requiring closure (or possible closure) as detailed in **ES Volume 3: Annex 8-A of Appendix 8-L [EN010131/APP/3.3]**.

Sett closure can only be undertaken between 1st July and 30th November and therefore, it is recommended that a pre-construction survey is undertaken in the spring e.g. March, prior to the application of the mitigation licence.

If the pre-construction survey identifies any changes to sett activity or new active setts, or if an existing disused sett has become active (and is within the developable area), then these will be avoided and any update to these mitigation measures made accordingly.

Lighting will be kept to a minimum during construction works and this will ensure there are no indirect impacts on Badger. Construction working hours will be 7am until 7pm Monday to Saturday and during construction in the winter months, mobile lighting towers with a power output 8kVAs will be used. Any lighting required during the construction phase will be directed away from retained habitats and include hoods or cowls to direct light forwards into the construction areas.

Any excavation works during construction will be covered overnight or will include a means of escape (such as a plank or ladder) to ensure Badger are not trapped in open excavations.

Appendix B. Outline Tree Protection Measures

The default position as set out by BS 5837:2012 is that retained trees must be protected from construction operations with the erection of robust protective fencing positioned on the outer edge of the RPA or crown spread (whichever is greatest). All site operations will be restricted to the area outside of tree protection fencing and this area will form a Construction Exclusion Zone (CEZ) unless agreed otherwise. Protection measures will be installed as set out in the Tree Protection Plan.

The area inside the fence and any additional tree protection measures will be sacrosanct and must not be removed or altered without the prior approval of the LPA Tree Officer. Any damage to tree protection measures must be reported immediately.

Fencing shall be constructed with robust vertical and horizontal scaffold framework with weldmesh panels firmly attached as per BS 5837:2012 Figure C.1 below. Vertical support poles and bracing poles must be located with care to avoid underground utility services and will be sited to avoid the structural roots of retained trees.

Alternative equivalent robust and immovable fencing specification including site hoarding will also be appropriate.

Suitable all-weather signage will be fixed to fencing to notify site staff and visitors of the construction exclusion zone and its purpose.

When entering and exiting the site the fencing contractor must avoid the production of ruts on the unprotected surface of the ground.

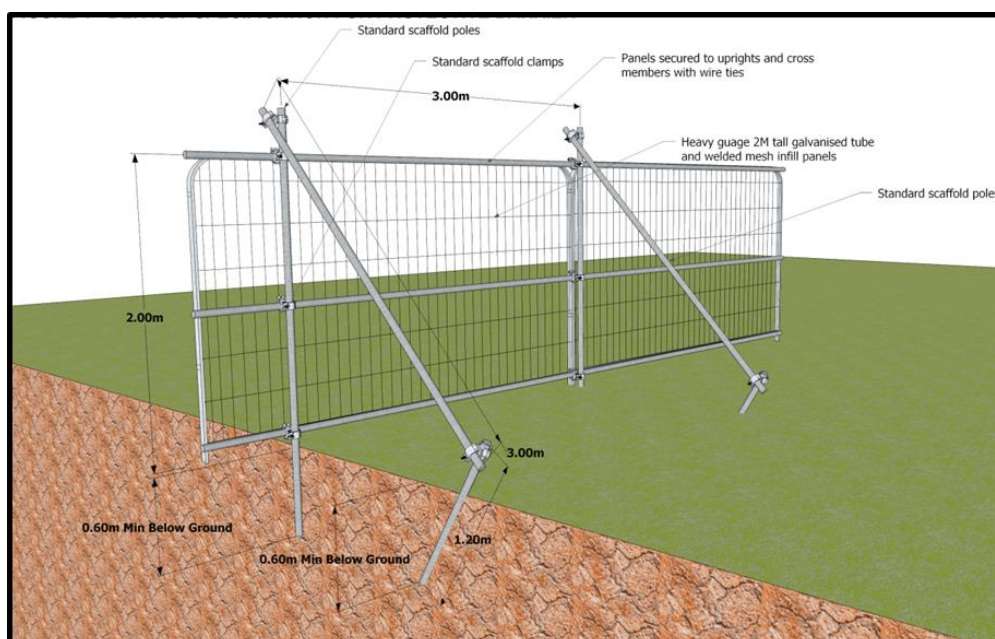


Figure C.1 Default specification for protective barrier

Ground Protection

Should access be unavoidable within the RPA of a retained tree, fit for purpose ground protection must be in place which is sufficient to protect the structure of the soil from damage based on the heaviest anticipated load.

As set out in section 6.2.3.3 of BS5837:2012 the following ground protection measures will be appropriate:

- a) Suitable ground protection for pedestrian only access will comprise a single thickness of scaffold boards set on a compressible layer of 100mm of woodchip on a geotextile separation layer.
- b) Pedestrian operated plant up to two tonnes in weight would require the use of a proprietary ground protection system (such as Ground Guards or Eve Trakway or equivalent) set on a minimum depth of 150mm woodchip or sharp sand.
- c) Heavier loads will require ground protection to an engineering specification in conjunction with arboricultural advice.

As a guide the threshold beyond which root development is significantly affected is a bulk density ranging from 1.4g per cm³ for clay soils, to 1.75g per cm³ for sandy soils. Tree protective measures shall stay in place until all construction operations are completed and removal is agreed with the Site arboriculturist and/or the Local Authority Tree Officer as appropriate.

General guidance for the management of exposed roots

Excavation must only take place within the RPA of a retained tree with the prior agreement of an arboriculturist and the Local Authority Tree Officer. All excavation must be undertaken using hand tools or compressed air (such as an air spade).

The following general principles will apply:

- a) Individual or small groups of roots less than 25mm in diameter will be retained where practicable but can be severed with a sharp tool such as secateurs or pruning saws to leave a clean-cut end (ideally 100mm back from the face of the excavation to account for future regrowth) where they pose an obstruction.
- b) Where roots are encountered which are larger than 25mm in diameter or where significant groups of smaller roots are found, the advice of an arboriculturist must be sought to decide an appropriate course of action (following consultation with the Local Authority Tree Officer where appropriate).
- c) Roots must only be exposed for the minimum period. In the interim period any exposed roots must be completely covered with dampened hessian sacking (which may require ongoing re wetting) to avoid drying out and exposure to light (which can result in the death of roots). Backfill for excavations should utilise the parent material and must not be significantly compacted.

Storage, use and mixing of materials

The use, mixing and washing of materials can lead to run off or inadvertent spillage into tree root zones. Many substances often used on construction sites can be toxic to tree roots (such as concrete, fuels, salts, builders sand and herbicides), can result

in the death of tree roots and beneficial soil organisms; and have a significant impact on the future health and appearance of trees.

The storage of materials can result in an effective raised soil level. This buries tree roots at depths where air and water are less available and can lead to the decline or death of the tree.

For these reasons the storage of materials and any washing, mixing or refuelling must take place in agreed allocated areas at least 10m from the edge of the RPA of retained trees.

Any slope effect must be taken into account and where there is a potential for run off, heavy duty polythene sheeting and sandbags must be in place as bunding to prevent toxic materials reaching RPAs.