RWE

Tween Bridge Solar Farm

7.5 Outline Ecological Construction Management Plan

Planning Act 2008
Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

APFP Regulation 5(2)(q)

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1 Introduction and Context

1.1. Introduction

1.1.1. This Outline Ecological Construction Management Plan (eCMP) has been prepared by Tyler Grange Group Ltd on behalf of RWE Renewables UK Solar and Storage Ltd (the Applicant) in respect of 'Tween Bridge Solar Farm' (the Scheme) and is being submitted as a standalone document separate to the **ES Chapter 7 Ecology and Nature Conservation [Document Referenced 6.2.7 Revision 5]**. The ES chapter should be read for full context. For the purpose of this report, the extent of the Scheme is referred to as the 'Order Limits', which includes all areas proposed for solar panels, ecological mitigation areas and associated infrastructure.

1.1.2. This **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** sits alongside the **Outline Construction Environmental Management Plan [REP4-045]** and details measures and approaches to be adopted which will limit the likelihood of impacts upon retained habitats through damage, pollution and disturbance. Habitat protection buffers will be maintained throughout the construction phase, and identified with appropriate fencing and signage along with team briefings and 'tool box talks'. The Development Consent Order (DCO) will contain a requirement providing that the final **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** shall be submitted to and approved by the relevant local planning authority.

1.1.3. This **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** requires the implementation of construction-phase ecological protection and mitigation measures, including habitat protection buffers, species protection measures and construction controls. The final Ecological Construction Management Plan is secured via Requirement 8(2) of the **draft Development Consent Order (DCO) [Document Reference 3.1 Revision 8].**

1.1.4. This **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** describes measures to be implemented during the construction process and includes commitments to Species Protection Plans, Reasonable Avoidance Measures (RAMs), pre-construction surveys and appropriate derogation licenses as well as pollution

(including dust, silt and air quality) control, managed construction lighting, noise, traffic management measures and directional drilling details.

1.1.5. The intention of this document is to provide details of the measures which will be required during the construction phase of the proposed project to ensure adverse impacts on ecological receptors are either avoided or adequately mitigated.

1.1.6. The assessment assumes that construction of the Scheme is built out over up to, a 54 month-period (2028- 2032) in either a single phased approach (development of Land Parcels completed one after another with the potential for breaks between development of Land Parcels) or through multiple phases (development of Land Parcels concurrently). For the multiple phase construction option, no more than two land parcels (within land parcels A-E) would be built out at the same time. The current connection date for the Scheme, within the NESO Connection Agreement is 2029. As with all electricity generation projects, this date is under review by NESO as part of the ongoing connections reform process.

1.1.7. If the NESO Connection Agreement remains with the connection date of 2029, it would be possible to operate a phased start to operational generation. This phased approach would connect each Land Parcel to the RWE on-site 400kV substation when construction of that Land Parcel was completed. In this operational scenario there would be partial Scheme operation from 2029-2032 (3 years). From 2032 onwards the full Scheme would be generating at full operational capacity. The full Scheme would operate for 40 years until 2072. If the NESO Grid Connection date varies, which is not within the Applicants direct control, the timeframe where there could be partial operation of the Scheme could reduce or fail to materialise. In this situation the full operational Scheme would operate for 40 years from its new grid connection date. In either connection scenario there will be full operational generation for 40 years, which would be the worst-case scenario operational time period for the Scheme.

1.1.8. Following 40- years of a fully operational Scheme, it is proposed that the Scheme will be decommissioned. This decommissioning with take approximately 24 months and will be in a phased approach.

1.1.9. The final construction programme will depend on the detailed layout, design and potential environmental constraints on the timing of construction activities.

1.1.10. This Plan broadly discusses:

- A risk assessment of potentially damaging construction activities.
- Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction (may be provided as a set of method statements).
- The location and timing of sensitive works to avoid harm to biodiversity features.
- The times during construction when specialist ecologists need to be present on site to oversee works.
- Responsible persons and lines of communication.
- The role and responsibilities on site of an ecological clerk of works (EcoW) or similarly competent person.
- Use of protective fences, exclusion barriers and warning signs.
- Details of any lighting during construction.

1.1.11. This **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** is informed by a suite of ecological survey work, which has identified the presence of protected/notable sites, habitats and species both within and adjacent to the Order Limits, all of which will need a degree of protection and mitigation during the site's construction. The following section of this Plan summarises the baseline context regarding ecological receptors within the Zone of Influence of the site.

1.1.12. The responsibility for ensuring works proceed in accordance with **this Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** will lie with the Applicant and the appointed contractor for the works. Overall control will be held by the Applicant and the contractor's site manager or a suitable delegate within the contractor's company.

1.1.13. Prior to the implementation of this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]**, biodiversity awareness training to employees and contractors will be undertaken by competent professionals so as to avoid unnecessary adverse impacts on

biodiversity during the construction stages as part of a Biodiversity Management Strategy in line with Overarching National Policy Statement for energy (EN-1), 2025 [1].

1.1.14. The implementation of the approved **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** will be a requirement under the Development Consent Order.

2 Ecological Features

2.1. Site Context

2.1.1. The Order Limits consist of 1831ha of agricultural land, which comprises mainly arable farmland with cereal and non-cereal crops. Fields are bounded by watercourses as well as fences, hedgerows and tree lines. Managed modified grassland is also present within the Order Limits as well as a woodland copse and a number of ponds.

2.1.2. The Tween Bridge Wind Farm is located within the Order Limits, and consists of twenty-two operational wind turbines. The Stainforth and Keadby Canal crosses the Order Limits from west to east.

2.1.3. In the wider context, the Order Limits is surrounded by extensive areas of farmland and areas of woodland, with areas of lowland peat bog (Thorne & Hatfield Moors) located to the north and south of the Order Limits.

2.1.4. The Order Limit lies outside of designated sites, with the exception of Thorne & Hatfield Moors Special Protection Area (SPA), Thorne Moor Special Area of Conservation (SAC), Thorne, Crowle and Goole Moors Site of Special Scientific Interest (SSSI) and Hatfield Chase Ditches SSSI. Whilst the Moors SPA/SAC/SSSI lies within the Order Limits, they are outside the development footprint.

2.1.5. This section of the **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]**

[1] Overarching National Policy Statement for energy (EN-1), 2025 (accessible webpage) - GOV.UK

summarises the existing ecological features within the Order Limits which are reported as part of the ES Chapter concerning biodiversity matters.

2.2. Designated Sites

2.2.1. **Table 2-1** below summarises the statutory designated sites located within and adjacent to the Order Limits which have been screened in for further assessment regarding potential construction phase impacts. They have been screened in due to their proximity to the Scheme, or potential/known presence of qualifying features associated with the site. The other sites within the Zone of Influence are considered to be sufficiently distant, with no potential impact pathways, to avoid any adverse impacts as a result of the proposals.

2.2.2. The distances provided are located to the closest sections of the Order Limits.

Table 2-1: European Statutory Designated Sites that Occur within 10km of the Order Limits

Site Name	Distance / Direction	Description
Hatfield Chase Ditches SSSI	Within Order Limits	Complex of ditches which retain elements of former marshland. Ditches contain a rich assemblage of aquatic and emergent plants, water vole and nationally scarce beetles
Thorne, Crowle and Goole Moors SSSI	Within Order Limits	Remnant of once extensive raised bog. Highly regarded for its invertebrate fauna and breeding and wintering bird populations
Thorne Moor SAC	Within Order Limits	H7120 – degraded raised bogs still capable of natural regeneration
Thorne and Hatfield Moors SPA	Within Order Limits	Breeding nightjar
Humberhead Peatlands National Nature Reserve NNR	Adjacent to northern boundary of Order Limits	Largest are of raised bog in lowland Britain
Hatfield Moor SAC	0.1km south	H7120 – degraded raised bogs still capable of natural regeneration

Hatfield Moors SSSI	0.1km south	Remnant of once extensive raised bog – notified because of its important breeding bird and insect populations
Humber Estuary SPA/Ramsar/SAC	SPA – 7.7km north, Ramsar -	Assemblage of birds including wintering, passage and breeding birds.
Humber Estuary Ramsar	6.2 km north-east	Estuarine habitats, populations of grey seals and assemblage of birds including wintering, passage and breeding birds, and migrating river and sea lamprey
Humber Estuary SAC	6.2 km north-east	Estuarine habitats including coastal plain-mudflats and sandflats

2.2.3. A number of non-statutory nature conservation sites have also been identified both within and adjacent to the Order Limits, full details of which are provided in the **ES Chapter 7 Ecology and Nature Conservation [Document Reference 6.2.7 Revision 5]**. The sites are broadly discussed within this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** in terms of required mitigation measures, but broadly comprise woodland copses, ditches/drains and a former railway lines.

2.3. Habitats

2.3.1. The Order Limits is dominated by arable land in use as cereal crops, with some areas of modified grassland and tall ruderal vegetation. All of these habitats are of intrinsic negligible ecological importance in their own right and do not require any specific considerations regarding protection during the construction phase. They are known, however, to support protected/notable species, which are discussed in the relevant sections of this report.

2.3.2. Other habitats of local importance, some of which are also identified as Habitats of Principal Importance (HoPI) under the Natural Environment and Rural Communities Act (NERC) Act 2006, are also present within the Order Limits, comprising scrub, hedgerows (HoPI), lines of trees, ponds (HoPI), ditches and woodland (HoPI).

2.4. Protected and Notable Species

Amphibians

2.4.1. The majority of the habitats within the Order Limits, namely the arable fields, provide limited suitability as terrestrial habitat for great crested newt (GCN) *Triturus cristatus* and other amphibians. eDNA surveys of accessible ponds (noting not all within 250m of the Order Limits were accessible) has confirmed the likely absence of GCN within the Order Limits. Other amphibians may be present in ponds within the Order Limits, however, and may cross the site during their terrestrial phase.

Badger

2.4.2. Badgers are known to be present in the landscape and within the Order Limits, although are protected for welfare concerns rather than being of any unfavourable conservation status.

Bats

2.4.3. Detailed bat surveys were completed in 2025. The Order Limits contains habitats which are generally of low suitability for foraging/commuting bats, confined to linear habitat corridors within and around the Order Limits. Trees and buildings may also provide potential roost sites for bats.

Birds

2.4.4. Breeding Birds: The Order Limits is known to support a range of breeding farmland birds associated with all habitats recorded within the site. Of particular importance is the widespread presence of skylark territories across the Order Limits.

2.4.5. Non-Breeding Birds: The Order Limits is known to support a number of non-breeding bird species associated with the Humber Estuary SPA/Ramsar, along with the presence of such species in adjacent land.

Reptiles

2.4.6. Specific surveys for reptiles have not been completed as much of the Order Limits comprises intensively managed arable habitat which has negligible value for reptiles. The ditch network may, however, provide some habitat and connectivity for reptiles, as this species group is known to be present in the surrounding landscape.

Otter / Water Vole

2.4.7. Surveys for this species have confirmed the presence of water vole in short sections of ditch in the north of the Order Limits. Otter have also been confirmed in the southeast of the Order Limits (See **Confidential Report - Otter and Water Vole Survey Report *[Circulation of Report is Restricted]* [APP-077]).**

2.4.8. Both species are also known to be present in the surrounding landscape and Hatfield Chase Ditches SSSI is designated for the presence of water vole.

Other

2.4.9. Brown hare and hedgehog are also both known to be present in the Order Limits and surrounding landscape.

2.5. Invasive Non-Native Species

2.5.1. Water fern and rhododendron, both listed as invasive plants under Schedule 9 of the Wildlife and Countryside Act 1981 have been recorded within the Order Limits.

2.6. Relevant Legislation

2.6.1. Construction cannot be undertaken which compromises the survival or success of the fauna described above where this could result in an offence under protective legislation pertaining to wildlife; nor which results in the spread of non-native invasive species.

2.6.2. GCN are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) (the 'Habitats Regulations'). It is an offence to deliberately kill, injure, disturb or capture them; deliberately take or destroy their eggs; and to damage or destroy their breeding sites and resting places. It is also an offence under the Wildlife and Countryside Act (WCA) 1981 (as amended) to intentionally or recklessly disturb GCN while they occupy a structure or place used for shelter or protection and to obstruct access to a place of shelter or protection. Where an offence would otherwise be likely to occur, a Natural England licence is needed in advance of relevant works to ensure these are undertaken legally and that suitable mitigation and compensation measures are in place.

2.6.3. Badgers are afforded protection under the Protection of Badgers Act 1992, making it an offence to kill, injure, take, ill-treat or disturb a badger when it is occupying a

badger sett, or to damage, destroy or interfere with a sett unless a licence is obtained from a statutory authority.

2.6.4. All bats and their roosts are afforded protection under the WCA 1981 (as amended) and are protected under the Conservation of Habitats and Species Regulations 2017 (as amended). This legislation makes it an offence to destroy, damage or obstruct access to a bat roost or to intentionally or recklessly disturb, injure or kill any bat. The roost is protected whether bats are present or not.

2.6.5. All wild bird species, their eggs and nests are legally protected under the WCA 1981 (as amended), which makes it an offence to intentionally kill, injure or take any wild bird or take or destroy their eggs or nest or damage a nest while it is in use or being built (generally acknowledged to occur between March and August, inclusive, although this is not defined in law and birds can nest outside of this time). Species listed under Schedule 1 of the WCA 1981 (as amended) are afforded additional protection from disturbance while breeding.

2.6.6. Otters are protected under Schedule 2 of the Conservation of Habitats and Species Regulations 2017[2] and under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence, with certain exceptions, to:

- Intentionally or deliberately capture, kill, or injure an otter;
- Intentionally or recklessly damage, destroy, and disturb otters in a place used for shelter or protection, or obstruct access to such areas;
- Damage or destroy an otter breeding site or resting place;
- Possess an otter, or any part of it, unless acquired lawfully; and
- Sell, barter, exchange, transport, or offer for sale an otter or parts of them.

2.6.7. Actions that are prohibited can be made lawful by a licence issued by the appropriate Statutory Nature Conservation Organisation.

2.6.8. Water voles are protected under the Wildlife and Countryside Act 1981 (as amended), this includes protection from killing or taking by certain prohibited

[2] Natural England standing advice on otters at https://www.gov.uk/guidance/otters-advice-for-making-planning-decisions

methods and their breeding and resting places being fully protected from destruction or obstruction, it is also an offence to disturb them in these places.

2.6.9. From April 2008, water voles and their resting places were fully protected in England, it is an offence to deliberately, capture, injure or kill them or to damage, destroy or obstruct their breeding or resting places. It will continue to be an offence to disturb them in their breeding or resting places.

2.6.10. White clawed crayfish are given only partial protection under the Wildlife and Countryside Act 1981, it is lawful to undertake works which would kill them but it is unlawful to move them without a licence.

2.6.11. Common reptile species are protected under the WCA 1981 (as amended). This legal protection prohibits the intentional killing or injury of reptiles, although it is important to note that this legislation protects the species and not their habitat.

2.6.12. It is illegal to plant or otherwise cause to grow in the wild any plant species listed under Schedule 9 of the WCA 1981 (as amended).

2.6.13. Adoption of control measures described within Section 3 of this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** will ensure that no breach in relevant legislation occurs with regard to GCN, badger, bats, breeding birds, reptiles, otter and water vole. The measures proposed will also protect other protected and notable species which may be present on the site, including priority species, common toad, hare, hedgehog and harvest mouse.

3 Outline Ecological Construction Management Plan

3.1. Risk Assessment of Potentially Damaging Construction Activities

3.1.1. To inform the preparation of this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]**, a risk assessment has been completed on all proposed construction-type activities likely to impact important/sensitive ecological features within and immediately adjacent to the site, as detailed below.

3.1.2. The proposed layout has been designed to retain those habitats/protected sites which have been identified as being of greatest ecological importance which, in the context of the Order Limits are:

- SAC/SPA/Ramsar/SSSI/NNR designations;
- LWS designations;
- Hedgerows;
- Ditches and Ponds;
- Woodland;
- Scrub;
- Trees

3.1.3. Small amounts of hedgerow are anticipated to be lost to facilitate access, but this is not expected to be more than 14m length in any given location, although will be less in most places, and wherever possible existing field gates and hedgerow breaks will be utilised to avoid hedgerow loss. Ditches and woodland copses will also be retained and appropriately buffered – discussed in detail below.

3.1.4. Ecological mitigation through the design of the Scheme proposes to create large, open areas of permanent species-rich pasture and arable managed sensitively for both over-wintering and breeding birds, particularly skylark and wading bird species associated with the Humber Estuary SPA/Ramsar. This is in addition to the main body of the site being re-seeded with a grass mix and grazed by sheep or subject to an appropriate mowing regime. Where ecological mitigation is required to offset impacts (including loss of functionally linked land), such mitigation will be

created in advance of the commencement of construction activities that would give rise to those impacts. Full details of the landscape management principles are set out in the accompanying **Outline Landscape and Ecological Management Plan (LEMP) [REP4-055].**

Site Clearance

3.1.5. During the clearance of habitats, there is potential for impacts to occur as a result of the following:

- Damage and destruction of retained habitats including habitats associated with international/national/local designations, hedgerows, woodland, trees and ponds, negatively impacting the structure and viability of these habitats post-development;
- Dust deposition resulting in damage to retained habitats within the site and adjacent offsite habitats, which is particularly important in the context of the ditch and watercourse network within and adjacent to the Order Limits;
- Air pollution from vehicle movements resulting in damage to retained habitats, which is particularly important in the context of the protected sites within and adjacent to the Order Limits;
- Contaminated run-off, including silt and mud resulting in damage to retained habitats within the site and adjacent offsite habitats, which is particularly important in the context of the ditch and watercourse network within and adjacent to the Order Limits;
- Killing and injury of GCN (if present), amphibians, badger, nesting birds, brown hare, hedgehogs and/or reptiles resulting from habitat removal or destruction during constructions works;
- Noise and general construction activity resulting in disturbance of species within and adjacent to the site, which is particularly important in the context of over-wintering/passage birds which are known to utilise adjacent land; and
- Temporary lighting disturbing nocturnal species, such as bats.

Site Set-up

3.1.6. Site set-up could result in impacts occurring as a result of the following:

- Damage to retained habitats as a result of pollution from plant maintenance and storage of oils, fuels and chemicals, including toilets and foul water;
- Damage to retained habitats as a result of contaminated run-off, including silt and mud and airborne pollutants including dust;
- Site lighting, in particular overnight lighting, has the potential to cause disturbance to foraging and/or commuting bats as well as other nocturnal species; and
- Construction activities including compaction of ground and accidental damage to retained and immediately adjacent offsite habitats.

Groundworks

3.1.7. Construction groundworks including creating foundations and excavations could result in impacts including:

- Damage to retained habitats through accidental damage; and
- Impacts to wildlife, including amphibians, badger, birds and other small mammals, should these become trapped in pits and trenches created during groundworks.

3.1.8. In addition to these pathways, groundworks impacts could occur as a result of killing or injury of wildlife, damage to retained habitats, dust, noise, contaminated run-off including mud and silt, airborne pollution including dust and artificial lighting as detailed above.

Material Storage and Removal from Site

3.1.9. The improper storage and disposal of materials during site clearance and construction could cause impacts to retained and adjacent habitats, as a result of dust, run-off and noise (as detailed above) which could result in direct impacts through damage or long-term impacts such as loss of function.

Construction

3.1.10. During construction there is potential for impacts to occur as a result of killing or injury of wildlife, damage to retained habitats, airborne pollution, noise, run-off and artificial lighting (as detailed above).

Environmental Incidents

3.1.11. Whilst not part of any specific construction stage, environmental incidents have the potential to occur at any time during the works, such as from:

- Vandalism resulting in impacts to retained habitats through direct damage or pollution events, should fuel or chemical containers become damaged;
- Fires and burning waste could result in impacts to retained on and offsite habitats and protected/notable species should this occur close to retained habitats;
- Emergency incidents such as spillages or extreme weather resulting in impacts to retained and adjacent habitats; and
- Bentonite spillage from Horizontal Directional Drilling (HDD).

3.2. Identification of 'Biodiversity Protection Zone'

3.2.1. Areas within the Order Limits identified as 'biodiversity protection zones' for retained habitats of ecological importance, protected and notable fauna species are included within **Table 3-2**, below. These areas will be clearly demarcated with protective fencing on site and will be subject to a strict exclusion of construction activities, including storage of materials, vehicle access and ground disturbance, unless otherwise agreed with the Ecological Clerk of Works. However, there will be no construction works undertaken within the boundary of Thorne Moor SAC and Thorne and Hatfield Moors SPA, which is located within a biodiversity protection zone.

3.3. Practical Measures to Avoid or Reduce Impacts During Construction

3.3.1. Prior to construction commencing, updated ecology surveys will be undertaken and agreed with the relevant local authority and are likely to include updated badger, GCN, water vole and otter surveys. Based on the measures provided below that will prevent impacts occurring to protected species, it is not expected that any significant changes to the methods detailed will be required. However, the updated data will confirm the measures are appropriate and will be used to support any necessary protected species licences. In addition to the above surveys the following will be undertaken prior to construction:

- An updated ecological desk study and habitat walkover survey of the Order Limits will be undertaken by a suitably qualified ecologist to determine whether the suitability of habitats for passage and non-breeding birds associated with the Humber Estuary SPA and Ramsar site has increased since the baseline surveys were completed; and;

- The results of this pre-commencement survey will be used to inform the ecological mitigation to be included within the Landscape and Ecological Management Plan to be prepared and approved for the relevant phase of the Scheme in accordance with Requirement 8 of the Draft DCO [Document Reference 3.1 Revision 8].

3.3.2. Practical measures (both physical measures and sensitive working practices) to avoid or reduce impacts during construction will be adopted to ensure that important ecological features are protected during construction and to allow works to proceed in line with relevant environmental legislation.

3.3.3. An initial 'toolbox' talk (TBT) will be completed with the contractors, to explain the sensitive features present on the Order Limits and the requirements for protection measures. This TBT will also provide detail on the working methods to be employed during all works affecting sensitive habitats and in relation to legally protected species present, or with potential to be present, on the Order Limits. This TBT will be delivered by an appointed Ecological Clerk of Works (ECoW), comprising a suitably experienced ecologist.

3.3.4. Prior to construction commencing at the Order Limits, the appointed ECoW will walk the construction area in a given phase with the site manager to ensure that protective fencing for retained habitats has been installed and no-work zones clearly identified and communicated to all contractors.

3.3.5. All non-statutory designated sites within and adjacent will have temporary appropriate signage displayed during the construction phase of the Scheme in order to ensure that accidental damage to habitats within the LWS/CLWS does not occur.

3.3.6. Works will be undertaken during daytime wherever possible, to avoid the need for lighting and to undertake works when a number of nocturnal species are least active, to minimise disturbance to their foraging and commuting activities. In winter months, it is expected that work may begin in the morning before full light and continue into the afternoon during hours of darkness. These short spells of

work are not considered to require any specific mitigation or controls as nocturnal species (primarily bats) will either be hibernating or with significantly reduced activity.

3.3.7. The compounds will be located away from any sensitive receptors as much as possible to minimise potential impacts (further detail provided below). In addition, any foul water produced at the Order Limits during the construction process will be removed from the Order Limits.

3.3.8. Construction will be completed in phases and in order to avoid impacts on nesting birds and to ensure compliance with the provisions of the Wildlife and Countryside Act 1981 (as amended), vegetation removal within phased construction areas will take place outside of the bird breeding season where possible (March to August). If vegetation works (including any crop removal required to facilitate development) are necessary during the breeding season, any suitable nesting habitat to be affected by works, including grassland, arable, hedgerows, scrub or trees, will be checked by a suitably experienced ecologist prior to works commencing. Works would be permitted to proceed only when the ecologist is satisfied that no offence will occur under the corresponding legislation.

3.3.9. If an active bird nest is identified during works within the breeding bird season (March to August)., the supervising ecologist will immediately inform the site manager and establish a 5m exclusion buffer around the nest. No works or disturbance-causing activities will take place within this buffer until the nest is confirmed by the ecologist to be inactive.

3.3.10. Nesting bird checks will be repeated during different phases of work or at different times during the nesting bird season (March to August) to ensure that none are impacted during works.

3.3.11. The creation of new habitats, including mitigation parcels will be phased, ensuring that mitigation areas are created prior to the onset of each relevant construction phase and ensuring alternative nesting and foraging habitat is available for bird species during construction.

3.3.12. Grassland creation within the arable fields will commence in the growing season prior to being required as mitigation areas, in order to ensure grassland habitat is present and available for the functionally linked species when they will be present over winter, prior to construction commencing.

3.3.13. In addition, pre-construction monitoring will be undertaken by a Suitably Qualified Ecologist to confirm that the habitats within the mitigation areas are functioning as intended and are available for use by the target species prior to construction in the associated areas commencing**.**

3.3.14. Further detail provided in the **Outline Landscape and Ecological Management Plan [REP4-055].**

3.3.15. The Scheme will be constructed in phases across discrete parcels within the Order Limits. As such, while mitigation parcels will be created prior to the commencement of each relevant construction phase, the impacts associated with the Scheme will arise progressively as individual phases are brought forward. In addition, habitats within the Order Limits that are not affected by construction will continue to provide suitable opportunities for the nesting bird species until such time as they are required for construction.

3.3.16. In addition, 100 nest boxes, comprising 5 barn owl nest boxes, 5 kestrel nest boxes and 90 small nest boxes comprising a mixture of open-fronted and hole-fronted nest boxes, as detailed in the **Outline Landscape and Ecological Management Plan [REP4-055]** will be provided in the Order Limits. These will be placed within suitable habitat within the Order limits prior to construction commencing, ensuring alternative nesting habitat is available.

3.3.17. **Run-off** - To prevent run-off, including from mud and silt, and pollution occurring, protection measures will be implemented during the clearance and all subsequent stages, as set out below. Construction methodology will be designed to comply with good practice guidelines (CIRIA, 2015[3]) and will include the following measures as necessary:

- Use of double stacked straw bales or other methods such as bunds to collect any potential run-off;
- Using secondary containment such as bunds around storage tanks where necessary;
- Ensuring deliveries are completed away from any watercourses/ditches;

[3] CIRIA (2015). Environmental good practice onsite guidance (fifth edition) (C81 1D). London.

- Ensure chemicals and hazardous substances are securely stored, labelled appropriately and regularly inspected; and
- Provision of jet washer and water bowser to remove mud from vehicles as necessary.

3.3.18. A pollution/spillage plan will also be put in place prior to the start of works. This will include training for site management, TBT for operatives and provision of spill kits.

3.3.19. **Dust** - Dust arising during construction work is generally considered to only have a significant ecological impact within 20m, where heavy soiling of vegetation can occur (Holman *et al*, 2014[4]). However, Natural England (NE) has advised that dust produced during the construction phase could cause smothering effects if a designated site is within 200m due to more sensitive habitats being present. Therefore, impacts to the retained habitats on and adjacent to the Order Limits, could occur.

3.3.20. Dust generation during construction would be minimised through a combination of management controls and practical mitigation measures. These include damping down exposed surfaces, haul routes, and stockpiles during dry or windy conditions, covering or stabilising fine materials, and phasing works to limit exposed ground. Construction traffic would be controlled through low on-site speed limits, use of defined haul routes, and wheel-washing and road-sweeping where required.

3.3.21. Contractors will suppress dust pollution with water including specialist spray equipment if required to dampen any arising debris and dust. Water from the dust suppression will then be controlled by suitable methods to prevent run-off (see above). Machinery exhaust emissions will be kept as low as is practicable by using well maintained vehicles and machinery at all times. These will be turned off when not in use.

3.3.22. Further to the above, specific measures for individual retained habitats and important species are provided in **Table 3-2** below. These include details of the location and timing of sensitive works and times during construction when specialist ecologists need to be present at the Order Limits to oversee works.

[4] IAQM (2014) Guidance on the assessment of dust from demolition and construction. Version 1.1. Available online at: www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

3.3.23. Throughout the construction period, the site manager will be responsible for ensuring that the protective fencing of retained habitats remains in place and fit for purpose. The maintenance of all such protection measures will be the responsibility of the site manager, however, an experienced ecologist acting as an ECoW will be available to attend the Order Limits, if required, throughout the construction period should any issues arise.

3.3.24. Any dust impacts would be temporary and with the implementation of the above measures, dust impacts onto retained and offsite habitats, including designated sites would be effectively controlled and not significant.

3.3.25. **Air pollution** –Air pollution from non-road mobile machinery (NRMM) is unlikely to affect local air quality significantly. However there are potential impacts on sensitive habitats when NRMM are located near designated sites. These impacts could occur when NRMM are within a 200m proximity of these sites. As detailed in **ES Chapter 14 Air Quality [REP2-25]** if there are fewer than 1,000 movements per day, no significant effect is anticipated. Nevertheless any vehicles and NRMM operating within 200m will remain as distant as practicable from the designation boundaries.

3.3.26. This will be controlled through locating site compounds away from any of these areas, the implementation of signs within the Order Limits to designate any areas where sensitive habitats are located. Workers will be informed during inductions, toolbox talks, and regular briefings about the importance of minimising vehicle use in these areas, ensuring operations are conducted in a manner that adheres to ecological protection guidelines.

3.3.27. **Lighting** - In order to prevent disturbance to nocturnal species the measures set out in the CEMP to control and minimise light spill beyond the Order Limits will be undertaken.

3.3.28. Construction lighting will be temporary and limited to periods where natural lighting is insufficient, primarily during winter months when daylight hours are reduced.

3.3.29. Core construction working hours are proposed to be from 07:00 hours to 19:00 hours Monday to Saturday and from 09:00 hours to 13:00 hours on Sundays, therefore minimising any impacts from lighting.

3.3.30. Construction temporary site lighting, in the form of mobile lighting towers with a power output of 8 kilo volt-amperes (kVA), 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 Site, 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.

3.3.31. 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 conform to best practice guidelines with respect to minimising light spill into adjacent habitats and prevent disturbance to bats and other species during construction;
- Lighting will utilise directional fittings to minimise outward light spill and glare (e.g. via use of light hoods/cowls which direct light below the horizontal place, preferably at an angle greater than 20° from horizontal);
- Lighting will be directed towards the interior of the Site rather than towards the boundaries; and;
- Where required, the positioning of construction lighting will be reviewed on site by the ECoW, taking into account the location of sensitive ecological receptors including mitigation areas and designated sites.

3.3.32. **Noise** – Any noise impacts will be temporary and measures will be undertaken to minimise impacts as much as possible through a combination of methods of work, implementation of mitigation measures and timings of works.

3.3.33. The majority of construction activity will comprise earth excavation and movement of plant through the Order Limits. Research recommends that construction noise levels are kept below 70dB to avoid excessive disturbance of birds. **Table 3-1** below is adapted from the Institute of Estuarine and Coastal Studies (University of Hull), which outlines the 'five' levels of disturbance. It should be noted that these figures are at the bird receptors, not at the source itself.

Table 3-1: Noise Impact Levels

Level	Impact	Effect Level	dBA	Example
1	None	Low	<50	Regular construction noise
2	Head turning, scanning behaviour	Moderate	<70	Piling noise, cranes, dumper trucks
3	Movement within zone	Moderate – High	>70	Piling noise
4	Movement out of zone (but within site)	High	>85	Piling noise
5	Movement off site	High	N/A	N/A

3.3.34. Noise attenuates at a rate of 6dB with every doubling distance, which means that in the absence of any further mitigation, noise would have dropped to an 'acceptable' level of 70dB at 100m from the source. It is expected that the majority of construction activity will be below 70dB and would therefore not cause any disturbance response to birds which may be utilising adjacent land, some of which is considered to be functionally linked to the Humber Estuary SPA/Ramsar. Consequently, no specific mitigation is considered necessary for noise impacts with regards to the Humber Estuary SPA/Ramsar and SAC.

3.3.35. Given the proximity of Thorne and Hatfield Moors SPA to the Order Limits and the fact it is designated for breeding nightjar, impacts from noise could occur during construction in proximity to the SPA boundary.

3.3.36. To prevent impacts, the following measures will be adopted across the Order Limits during construction.

- Ensuring vehicles and machinery are regularly serviced and in good condition;
- Speed limits;
- Installing silencers or attenuators where applicable;
- Replacing older equipment with quieter alternatives;

- Using broadband reversing alarms;
- Not leaving engines idling when not in use; and
- Siting any generators in the east of the Order Limits and at least 200m from the Thorne and Hatfield Moors SAC.

3.3.37. In addition, construction will be timed to avoid being undertaken during sensitive periods adjacent to the Thorne and Hatfield Moors SPA when nightjar could be present, generally between April to August[5], with no construction works to take place within ~~150m~~ 200m of this SPA within this period. Furthermore, construction will be timed to avoid being undertaken when non-breeding birds could be present within mitigation areas with no construction to take place within 200m of the mitigation areas between ~~November~~ October to February inclusive.

3.3.38. Where construction activities have the potential to generate elevated noise levels in proximity to sensitive ecological receptors, temporary acoustic screening measures will be implemented where necessary. This may include the use of acoustic barriers or bunding around high-noise activities, which may be incorporated into temporary site infrastructure such as security fencing where practicable. The requirement for such measures will be determined on site by the ECoW, based on the nature and location of activities and their proximity to mitigation areas and designated sites.

3.3.39. The ECoW will review the effectiveness of the proposed noise mitigation measures during construction and the requirement for mitigation will be considered met where all mitigation measures have been fully implemented and there is evidence that noise within identified sensitive areas, including the mitigation areas between ~~November~~ October to February and Thorne and Hatfield Moors SPA between April to August, have been reduced to levels that are not expected to result in significant adverse effects on ecological receptors. This will be informed by noise monitoring, ensuring levels are below 70dB at the boundary of the sensitive areas during construction, visual inspections ensuring all measures are in place, and observations of species behaviour where relevant, such as whether birds are recorded leaving land within the sensitive areas at the time of noise events.

[5] Nightjar Bird Facts | Caprimulgus Europaeus

3.3.40. **Visual Disturbance** – as qualifying birds of the nearby Humber Estuary SPA/Ramsar are known to use adjacent land, there is a risk that construction activity comprising regular human presence and plant movement could disturb birds in adjacent land. Some of this land is visually separated/screened from the proposed construction areas by existing hedgerows/built form, which would negate the need for any additional screening. In some instances, however, and depending on the phasing of construction activity, there may be areas where construction activity would not be visually screened from adjacent land and would, therefore, require a degree of mitigation.

3.3.41. In these instances, the appointed ECoW will review the proposed working areas and risk to birds in adjacent land (if a given phase would require works at a time of year when sensitive estuary birds would be present, taken to be September – March in any given year) and advise if additional screening in the form of hoarding/hessian mesh on the perimeter heras fencing is necessary. Such features will provide visual separation between the construction areas and adjacent land, and mitigate for any visual disturbance risk. It is expected, however, that not all of the Scheme would be 'built out' at the same time, so in the event of any visual disturbance, birds would be able to relocate to undisturbed parts of the Order Limits without conflicting with the conservation objectives of the Humber Estuary SPA/Ramsar.

3.3.42. **Horizontal Directional Drilling** - HDD will generally be utilised during construction under highways and some watercourses. General HDD practices are outlined below:

- Reflect known ground conditions to select a specific route and depth through the most homogeneous geological conditions possible;
- Casing of weaker un-cohesive layers to reduce bentonite breakout;
- Use as low a concentration of bentonite as reasonably practicable;
- Operatives to monitor the drilling for evidence of breakout and cease drilling and seal fissures or voids if applicable, as required;
- Monitoring of drilling fluid returns and volumes to help identify losses;

- Retain a stock of sandbags and pumps on site to contain breakout and dispose accordingly;
- Bentonite water slurry will be stored in the launch pits and transported to a registered disposal site(s); and,
- HDD wastewater (including bentonite) will be incarcerated within the launch pit and transported to a specialised local facility for disposal

3.3.43. Further detail regarding ~~HDD breakout~~ bentonite breakout, will be included within a HDD Method Statement that will form part of the final Construction Environmental Management Plan(s). Natural England will be consulted on measures addressing bentonite breakout that form part of the HDD Method Statement.

Table 3-2: Protection Measures for Habitats on Order Limits and Off-Site

Ecological Feature	Potentially damaging construction activities	Biodiversity Protection Zone	Measures to Avoid or Reduce Impacts During Construction	Responsibility
Designated Sites				
Thorne and Hatfield Moors SPA / SAC & Thorne, Crowle and Goole Moors SSSI & Humberhead Peatlands NNR	No direct impact on SPA/SAC but potential for habitat degradation through dust/water pollution and disturbance to breeding nightjar.	Minimum of ~~15~~200m stand off of construction works from boundary of SPA during the breeding season for nightjar (April to August)[6]. Implementation of the measures outlined above to reduce noise from construction works.	No construction works undertaken within the boundary of Thorne Moor SAC and Thorne and Hatfield Moors SPA. A Construction Method Statement will be adopted on site, which includes details on incident response, refuelling and storage of chemical and construction materials in order to prevent any spills or contamination, as far as possible. Storage of materials and maintenance of machinery will be undertaken away from retained habitats and associated 'biodiversity protection zones'.	Site Manager and Main contractor with advice from Ecologist / ECoW.

[6] `Nightjar Bird Facts | Caprimulgus Europaeus

			Details are expected to be in line with industry best practice guidance. Standard dust suppression techniques implemented throughout construction phase.	
Humber Estuary SPA/Ramsar	Disturbance to qualifying bird species in adjacent land	N/A	See bird section.	
Retained Habitats				
Hedgerows	Accidental damage due to use of machinery, soil compaction or storage of materials or because of pollution, such as dust, water, air and soil pollution.	Root protection area (RPA), which will be detailed in a future Tree Protection Plan.	Protection of retained hedgerows with tree protection fencing in line with BS 5837 (2012). Warning signs will be included on this fencing for information and to deter access.	Site Manager and Main contractor with advice from Ecologist / ECoW.
Ditches/watercourses (including those identified as Local	Accidental degradation of water quality due to directional / horizontal drilling, pollution (spills,	No water abstraction as part of the directional drilling from the ditch	A Construction Method Statement will be adopted at the Order Limits, which includes details on drilling methodology, incident response,	Site Manager and Main contractor with advice

Wildlife Sites and Hatfield Chase SSSI)	dust), damage of banks and riparian corridor.	network in the Order Limits is expected. IDB watercourses will be protected by a minimum 9m buffer, which will be delineated by heras fencing prior to works starting. Other ditches/watercourses will be protected with a minimum 5m buffer which will be delineated by heras fencing prior to works starting.	refueling and storage of chemical and construction materials in order to prevent any spills or contamination, as far as possible. Storage of materials and maintenance of machinery will be undertaken away from retained habitats and associated 'biodiversity protection zones'. Details are expected to be in line with industry best practice guidance. Standard dust suppression techniques implemented throughout construction phase. Potential impacts from bentonite breakout from HDD to be controlled with the implementation of the Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6] and CEMP, which will include a HDD Method Statement.	from project Ecologist / ECoW.

Woodland and Trees (including those identified as Local Wildlife Sites)	Accidental damage due to use of machinery, soil compaction or storage of materials or because of pollution, such as dust, water, air and soil pollution.	RPAs, which will be detailed in a future Tree Protection Plan.	Protection of retained woodland and trees with tree protection fencing in line with BS 5837 (2012). Warning signs will be included on this fencing for information and to deter access.	Site Manager and Main contractor with advice from project Ecologist / ECoW.
Ponds	Accidental damage as a result of pollution, such as dust, light and water pollution.	Minimum 10m buffer from pond margin, delineated by heras fencing.	Retention within a suitable buffer to be fenced using heras or mesh/barrier fencing. A Construction Method Statement will be adopted at the Order Limits site, which includes details on incident response, refueling and storage of chemical and construction materials in order to prevent any spills or contamination, as far as possible. Storage of materials and maintenance of machinery will be undertaken away from retained habitats and associated 'biodiversity protection zones'. Details are expected to be in line with industry best practice guidance.	Site Manager and Main contractor with advice from project Ecologist / ECoW.

Protected and Notable Species				
GCN	Potential to cause killing, injury or disturbance as a result of site clearance and ground works. Accidental damage to retained habitats of use to GCN resulting in their inability to disperse, breed or survive.	Minimum 10m buffer from pond margins, delineated by heras fencing.	Storage of materials will be located away from potentially suitable terrestrial habitat for GCN, to be discussed and agreed with the ECoW, in order to avoid creating potential refugia for GCN. Ideally to be located on hard standing or bare ground. Habitat manipulation required for reptiles would also provide reasonable avoidance measures (RAMs) for GCN. As a result, these works should be supervised by a Natural England GCN licensed ecologist. Hedgerow removal preceded by a hand-search for GCN and other herptiles in the active season (March – October). Should any GCN be recorded during works, all works would stop, a Natural England licence applied for,	Site Manager and Main contractor with advice from project Ecologist / ECoW. Licensed ECoW Licensed ECoW Applicant to instruct, project Ecologist to complete

			and the approved mitigation measures implemented prior to any works re-commencing.	
Badger	Potential to cause killing, injury or disturbance as a result of site clearance and ground works and lighting.	Up to 30m from an active sett, to be advised by the ECoW on site. No working or lighting after dusk.	Pre-commencement badger survey to record recent signs of badger activity on the Order Limits and evidence of badger setts. Monitoring of the sett previously recorded near P1 will be undertaken to determine whether the sett is active, should there be potential for impacts to badgers occupying this sett, if present, to occur. Should an active sett be recorded on the Order Limits which is likely to be impacted by construction, a strict 30m buffer for works with heavy machinery or ground investigations within 30m of a sett will be undertaken, a badger licence from Natural England will be applied for prior to such works being undertaken. As part of the licence application, a method statement and work schedule will be produced	ECoW Project Ecologist

			which will detail appropriate mitigation that will be implemented both during and post-construction, the personnel responsible for the licence and the timings of all works. Natural England will only grant a licence for interference or closure of a badger sett between July and November, inclusive. Any excavations will require covering overnight to prevent mammals becoming trapped or have a suitable plank/ramp (set at an angle no steeper than 45°) to provide a means of escape for mammals. Excavations left open/uncovered overnight will be inspected each morning to ensure no animals have become trapped overnight. Should a badger become trapped in a trench it will likely attempt to dig itself into the side of the trench, forming a temporary sett. Should a trapped badger be encountered the ECoW will be	Site Manager and Main contractor with advice from project Ecologist / ECoW.

			contacted immediately for further advice. Any mounds of soil/compost will be distributed around the Order Limits as needed or covered in turf, as quickly as possible, to reduce the duration they are stored. Storage areas, when required, should avoid potentially suitable habitats for other species identified in this report and be compacted around the base to reduce the potential for them to be used as a refuge. Regular checks should be undertaken by the site manager, or other nominated contractor, to look for signs of mammal digging, such as by badger. If present, the ECoW should be contacted for advice.	Site Manager and Main contractor with advice from project Ecologist / ECoW.
Bats	Potential to cause killing, injury or disturbance as a result of clearance and ground works and lighting.	RPAs of retained trees. No working or lighting after dusk.	Retention and protection of woodland and trees with bat roost potential. Should any tree removal or maintenance works be required a ground level tree assessment (GLTA) would be undertaken by a	Site Manager and Main contractor with advice from project Ecologist / ECoW.

	Accidental damage to retained habitats of use to bats resulting in loss or damage to bat roosts, if present. Disturbance to bats foraging or commuting on the Order Limits as a result of increased lighting.		suitably competent ecologist to identify whether the tree(s) have potential to be used by roosting bats. Should potential be identified further surveys would be needed to confirm the presence or likely absence of roosting bats. Should a bat roost be identified, which could be impacted by the works, a Natural England license would be required prior to such works, to agree a suitable mitigation strategy and timings of work prior to impacts to the roost from occurring. No lighting to be used during construction other than potentially for short spells in early morning/later afternoon in winter months when bats will either be not active or with significantly reduced activity.	Site Manager and Main contractor with advice from project Ecologist / ECoW.
Birds	Potential to cause injury or mortality to nesting	Suitable buffer to be agreed and demarcated by the ECoW around an	Retention and protection of suitable hedgerows, woodland and trees.	Site Manager and Main contractor with advice

	birds, their nests, eggs or young Potential to cause injury or mortality to ground nesting birds, their nests, eggs or young as a result of site clearance and ground works. Disturbance to non-breeding bird species associated with Humber Estuary SPA/Ramsar	active nest, depending on the bird species, nest location and surrounding habitat.	Vegetation clearance including groundworks timed to occur outside the breeding bird season (March - August). Should this not be possible, a search for nesting species should be undertaken by a competent ecologist. If a nest is found, a minimum 5m buffer will be agreed and construction will not be allowed to continue in the vicinity until the nest has fledged and/or the nest is no longer active, to be confirmed by a competent ecologist. ECoW to make decision regarding need for use of visual screening to be erected on boundary heras fencing, depending on potential bird sightlines into construction area if not screened already by vegetation/buildings.	from project Ecologist / ECoW. Site Manager and Main contractor with advice from project Ecologist / ECoW. ECoW

Reptiles	Potential to cause killing or injury as a result of clearance and ground works.	Ground works will not be undertaken in areas of suitable reptile habitat, namely grassland and scrub vegetation, until staged strimming is complete, to render the areas unsuitable, as confirmed by the supervising ECoW..	Retention and protection of grassland, ditches and pond vegetation most suitable for use by reptiles. Directional and staged strimming of suitable vegetation, to be agreed and supervised by the ECoW. To be undertaken during the active season (March-October), in suitable weather conditions (air temperature between 9 and 18°C[7]) to allow for reptiles (and GCN) to be displaced, out of harm's way into other areas of suitable habitat that will not be impacted by construction activities. All strimming works to be undertaken towards areas of suitable, retained habitat in a slow and sensitive manner.	Site Manager and Main contractor with advice from project Ecologist / ECoW. ECoW ECoW

[7] Froglife (1999) Reptile Survey: An Introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10. Froglife, Halesworth.

			First cut suitable vegetation to a height of c. 250mm with all arisings removed. 48 hours later, cut remaining vegetation to a height of c. 150mm in a directional manner towards suitable areas of retained habitat. Arisings should again be removed. Soil strip, if needed, can progress 48 hours later, in a directional manner. Following clearance, vegetation should be managed to remain unsuitable for reptiles (and GCN) until construction activities with potential to impact these species cease in these locations. Potential reptile refugia (which may also be suitable for use by GCN and other common amphibian species) should be carefully dismantled by hand in advance of clearance, where they would be impacted during construction. Materials could be relocated to another suitable area of habitat to be retained. Reptiles (or other species) found will be	ECoW

			carefully moved, by gloved hand, out of harm's way, to another area of suitable habitat to be retained.	
Water vole / otter	Disturbance to water vole and otter and/or damage to habitat. Potential for killing or injury. Impacts from lighting.	5 – 9m buffer zones around each watercourse. No working or lighting after dusk, unless necessary. Any necessary lighting only directed to where needed and temporary.	Prior to construction works commencing in a given phase, a pre-commencement inspection for water vole and otter will be undertaken along each watercourse within/adjacent to that phase as a precaution. Heras fencing will then be installed along each watercourse at 5 or 9m to prevent accidental damage of the watercourse by plant or construction activity. To minimise potential impacts, works will be avoided in the vicinity of ditches during the hours of darkness and within 2 hours after sunrise and 2 hours before sunset. This can be reduced to one hour between November to February (inclusive) because of the limited daylight.	ECoW Site Manager and Main contractor with advice from project Ecologist / ECoW. ECoW

			Where ditch management and improvement are proposed a suitably qualified ecologist will first survey the area prior to works to ensure no impacts on protected species are likely to occur.	ECoW
			Should any evidence of water vole or otter be encountered, the ECoW will advise on the most appropriate course of action. This may require extending the distance between the watercourse and heras fencing/no work areas, or completing work under a watching brief where necessary.	ECoW
			If it is considered that the works would constitute an offence under the relevant legislation, advice will need to be sought from the ECoW regarding a Natural England licence, with a licence applied for when necessary. No works to then proceed in the area water vole are	Applicant to instruct, project Ecologist to complete

			present until the licence is approved.	
White clawed crayfish	Disturbance White clawed crayfish and/or damage to habitat. Potential for killing or injury. Impacts from lighting.	5 – 9m buffer zones around each watercourse. No working or lighting after dusk, unless necessary. Any necessary lighting only directed to where needed and temporary.	Prior to any construction works commencing in a given phase, a pre-commencement inspection for white-clawed crayfish will be undertaken along each watercourse within/adjacent to that phase as a precaution. Heras fencing will then be installed along each watercourse at 5 or 9m to prevent accidental damage of the watercourse by plant or construction activity. Should any evidence of white-clawed crayfish be encountered, the ECoW will advise on the most appropriate course of action. This may require extending the distance between the watercourse and heras fencing/no work areas, or	ECoW Site Manager and Main contractor with advice from project Ecologist / ECoW. ECoW

			completing work under a watching brief where necessary. If it is considered that the works would constitute an offence under the relevant legislation, such as moving white-clawed crayfish, advice will need to be sought from the ECoW regarding a Natural England licence, with a licence applied for when necessary. No works to then proceed in the area until the licence is approved.	Applicant to instruct, project Ecologist to complete
Other species – hare, hedgehog	Potential to cause killing or injury as a result of clearance and ground works.	Suitable buffer to be agreed by the ECoW around any leverets or harvest mouse nests.	Retention of hedgerows, woodland, trees and ponds within suitable habitat buffers will retain the most suitable habitats on the Order Limits, and therefore opportunities for other species to be present. Brown hare is a mobile species so likely to be displaced from the Order Limits during construction activities, if present. During their	Site Manager and Main contractor with advice from project Ecologist / ECoW Site Manager and Main contractor with advice from ECoW.

			breeding season (February to September, inclusive) leverets (the young) are left in forms (small depression in the ground among long grass). At this vulnerable stage, should they be encountered during clearance works, a suitable buffer will be agreed by the ECoW and fenced/flagged until the leveret is able to move of its own accord.	
			Should hedgehog be encountered during clearance they should be carefully moved from harm's way with gloved hands into other suitable habitat. Ideally clearance of suitable hibernation habitat, if required, will be undertaken outside of their hibernation season, October/November to March/April, inclusive.	ECoW
			Should grassland >30cm tall need cutting between mid-May and October, a check of this vegetation	ECoW.

			by the ECoW should be undertaken prior to works, in order to check for harvest mice nests. Harvest mice nests are generally located in the stalk zone of reeds and grasses at least 30m above ground and vary between a diameter of approximately 5-10cm. In the event a nest is found, a suitable buffer will be agreed by the ECoW and fenced/flagged until the nest is no longer in use.	

3.4. Responsible Persons and Lines of Communication

3.4.1. During the construction period, the following responsible persons and lines of communication have been identified in order to guide the implementation of this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]**.

3.4.2. Advice and monitoring, including with regard to legal consents, DCO requirements and contractual arrangements, will be provided by the Applicant, the site manager and ECoW as appropriate.

3.4.3. The ECoW will monitor the implementation of ecological protection measures during construction. Where monitoring identifies that measures are not functioning as intended, or where unexpected ecological risks arise, the ECoW will advise on additional or alternative measures. These will be implemented by the Contractor to ensure compliance with this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** and relevant legislation.

3.4.4. In the event that protected species are encountered during construction, works will cease immediately in the affected area and advice will be sought from a suitably qualified ecologist. Where required, works will only recommence following the implementation of appropriate mitigation and/or the obtaining of any necessary licences.

3.4.5. The details of the site manager will be displayed on the Order Limits boundary with the site manager responsible for addressing any issues which are raised during construction.

3.4.6. The installation and maintenance of protective fencing will be undertaken by the contactor under the supervision of a suitably qualified site agent, this agent must be:

- Present at the Order Limits for the majority of the time;
- Aware of the arboricultural and biodiversity constraints;
- Having the authority to stop any work that is causing, or has the potential to cause harm to any retained habitat;

- Responsible for ensuring that all operatives at the Order Limits are aware of their responsibilities toward retained habitats and the consequences of any failure to observe those responsibilities; and

- Make immediate contact with the relevant local authority and/or a trained arboriculturalist in the event of any tree related problems occurring, whether actual or potential.

3.4.7. The site manager will make all contractors aware of the presence of retained ecological features and the measures implemented to protect these features.

3.4.8. Prior to the start of relevant construction works an ECoW will provide a TBT to detail the ecological features to be protected and the methods employed. Where any subsequent supervision of works is required, bespoke TBT will be delivered by an ECoW, prior to these works commencing, along with an updated walkover of the Order Limits to check for the signs of any protected or notable species and to check the methods detailed in the **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** are being adhered to.

3.4.9. In the event of accidents or damaging incidents occurring during construction, the site manager will liaise with the ECoW, arboriculturalist and local authority as necessary, to agree solutions and contingency measures. If damage is not considered to be significant the habitats may be allowed to regenerate naturally, although if required, replacement planting will be provisioned, with the scale of replacement to be determined by the ECoW.

Role and Responsibilities of an ECoW

3.4.10. An ECoW will comprise a suitably qualified and experienced ecologist, appointed to supervise the implementation of the **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]**.

3.4.11. The responsibilities of the ECoW will include attending the Order Limits prior to the start of works to deliver an initial TBT and to set out the ecological constraints and protection measures required.

3.4.12. The ECoW will be available to provide advice and undertake appropriate steps, including supervision, as detailed in **Table 2** as well as should any previously

unidentified or unexpected protected or notable species be encountered during works. The ECoW will keep a record of their visits and TBT delivered.

3.4.13. No post-construction monitoring will be undertaken by the ECoW as part of this **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]**. An Outline LEMP has been produced which details all post-construction monitoring and management measures.

3.4.14. Copies of all ecological reports relevant to the works, Natural England licence documents and TBT supporting documents will be kept on the Order Limits during construction and be made available to the ECoW and site manager at all times, so that they are familiar with identified ecological constraints relating to the Scheme.

Project Ecologist

3.4.15. The project ecologist will oversee all ecology matters at the site and will discuss site constraints regularly with the EcOW, site manager and the Applicant. Should any licence applications be required the project Ecologist will complete these applications following instructions from the Applicant.

Identifying and Rectifying Remedial Measures

3.4.16. As part of any compliance checks or ECoW visits, should any potential issues of non-compliance with the **Outline Ecological Construction Management Plan [~~Document Reference 7.5 Revision 5~~Document Reference 7.5 Revision 6]** be identified, these will be immediately reported to the site manager and appropriate actions agreed.

3.4.17. In the event a significant issue occurs, appropriate remedial measures will be discussed and agreed with all relevant parties. Such remedial measures will be reported to the relevant local authority, as required. Further checks will then be completed within an appropriate time frame to confirm that remedial measures have been correctly implemented to the satisfaction of the relevant local authority.