Longfield Solar Farm

Outline Landscape and Ecology Management Plan [PINS Ref: [EN010118]

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Quality information

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1. Introduction

1.1 Introduction

1.1.1 This Outline Landscape and Ecology Management Plan (OLEMP) has been prepared on behalf of Longfield Solar Farm Energy Farm Ltd (hereafter referred to as 'the Applicant').

1.1.2 It forms part of a Development Consent Order (DCO) application and provides a framework for delivering the landscape strategy and the successful establishment and future management of proposed landscape works associated with the Longfield Solar Farm (hereafter referred to as 'the Scheme'). It sets out the short and long-term measures and practices that will be implemented by the Applicant to establish, monitor and manage landscape and ecology mitigation and enhancement (biodiversity net gain) measures embedded in the design. The latter will be achieved through habitat creation over and above that used for habitat mitigation.

1.1.3 The Scheme will comprise the construction, operation, maintenance, and decommissioning of 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 Bulls Lodge Substation. The Scheme will be located within the 'Order limits' (as described below) and is the subject of the DCO application. The Scheme is described in ***ES Volume 1 Chapter 2: The Scheme*** **[EN010118/APP/6.1]**.

1.1.4 The area of land required for the construction, operation and maintenance, and decommissioning of the Scheme (the Order limits **Figure 1-2**) has informed the preparation of the Outline Landscape Masterplan, provided in Annex A. This includes land required for temporary and permanent uses. The Order limits comprises 453 hectares (ha) of land and is located within the administrative areas of Chelmsford and Braintree, in the county of Essex. The OLEMP forms part of the strategy for successfully integrating the Scheme within this landscape, and also mitigating related impacts identified within the Application. The Landscape Masterplan is based on the illustrative Concept Design (Figure 2-5 of the ES [**EN010118/APP/6.2**]) which represents a tangible physical example of how the Scheme could be constructed, with parameters limited or set by the Design Principles (Appendix A of the Design Statement [**EN010118/APP/7.3**]).

1.1.5 A Biodiversity Design Strategy is included as Appendix B to the Design Statement to illustrate the design approaches that could be incorporated to further enhance biodiversity on and around the Longfield Solar Farm. As set out in the Draft DCO [EN010118/APP/3.1], Requirement 9 will necessitate the submission and approval of a detailed Landscape and Ecology Management Plan (LEMP) to deliver the provisions as set-out out in this Outline LEMP and to confirm how any approaches and measures set out in the Biodiversity Design Strategy have been incorporated into the design. The Applicant will also collaborate with an academic partner to develop a biodiversity trial area within Project. It is anticipated that different methods of planting under and around PV Arrays would initially be trialled to investigate which methods may

be most effective in the context of current, operational and future needs of the land. It is the Applicant's ambition that this would add to the accumulated knowledge on biodiversity enhancements and land use at solar farms and help to inform the solar industry, including other future schemes.

1.1.6 This OLEMP is a live document, the content of which will continue to be updated, refined and (where necessary) added to, based on ongoing discussions between the Applicant and statutory bodies and relevant Local Planning Authorities. It will be updated by the Applicant into a final detailed Landscape and Ecology Management Plan (LEMP) prior to the commencement of works in accordance with the Requirements contained in Schedule 2 of the draft Development Consent Order (DCO).

1.2 Purpose of the Outline Landscape and Ecological Management Plan

1.2.1 The purpose of this OLEMP is to set out the measures proposed:

a. To mitigate the effects of the Scheme on landscape, biodiversity, and heritage features;

b. To enhance the biodiversity, landscape, and green infrastructure value of the Order limits; and

c. To secure compliance with relevant national and local planning policies.

1.2.2 The Scheme has been designed, as far as is practicable, to avoid or reduce effects on landscape, heritage, and biodiversity features through siting of the Scheme components, including structures and new planting. For further information see in particular, Chapter 7 Cultural Heritage, Chapter 8: Ecology, and Chapter 10: Landscape and Visual Amenity [**EN010118/APP/6.1**].

1.2.3 This document outlines the landscape, biodiversity and heritage impact avoidance measures that would be implemented prior to, and during, construction of the Scheme, as well as the habitat restoration, enhancement, management, and monitoring measures to be implemented once the Scheme is operational. Implementation of these measures is proposed to be secured by the requirement for an OLEMP to be submitted with the Application.

1.2.4 This OLEMP is structured as follows:

a. Section 1 sets out the context, responsibilities and arrangements for delivery of the plan.

b. Section 2 describes the landscape and ecology strategy for the Scheme which incorporate proposals for landscape, biodiversity, and heritage impact mitigation. The strategy is set out in the Outline Landscape Masterplan, Annex A.

c. Section 3 details the measures required for the effective management and maintenance of the landscape and biodiversity mitigation proposals.

d. Section 4 describes post-construction monitoring to determine that the functions documented within this OLEMP are being achieved and whether remedial action may be required.

1.3 Objectives

1.3.1 The overarching objectives of the OLEMP are to:

a. Integrate the Scheme into its landscape setting and avoid or minimise adverse landscape, biodiversity, heritage, and visual effects as far as practicable.

b. Promote the conservation, protection and improvement of the physical, natural and historic environment within the Scheme and its setting. The landscape framework should be seen as an integral part of the of the surrounding landscape.

c. Diversify ecological value through the retention of existing habitats, for example through retention of woodland, and to enhance these through restoration and creation of diverse habitats with high distinctiveness.

d. Guide the design and management of landscape and biodiversity components that respond to and enhance the character of the landscape, local distinctiveness and sense of place.

1.4 Responsibilities

1.4.1 The Applicant will establish the appropriate roles and responsibilities for site staff as set out in the Outline Construction Environmental Management Plan (OCEMP) [**EN010118/APP/7.10**]. An Environmental Clerk of Works (ECoW) will be responsible for ensuring construction environmental mitigation measures are correctly implemented, monitored and maintained. These measures will include, but not be limited to, vegetation clearance, species identification and exclusion (protected or otherwise).

1.4.2 The ECoW's role will cover activities that have the potential to impact biodiversity, for example by advising on methods and techniques to prevent or minimise light spill and the delivery of Toolbox Talks prior to the start of works that could potentially affect habitats and species.

1.4.3 The contractor appointed to construct the Scheme will be responsible for establishing, managing and monitoring the implementation and establishment of landscape and ecological mitigation within the five-year establishment aftercare period. The Applicant will inspect and report on the success of establishment during this period.

1.4.4 The long-term biodiversity monitoring and management requirements will be set out in accordance with the Requirements contained in Schedule 2 of the DCO.

1.5 Legislation and Policy

1.5.1 The relevant legislation and policies are summarised below. For more detail please refer to ***Appendix 8A: Ecology Legislation and Policy*** and ***Appendix 10A: Landscape Policy***.

Legislation

a. Directive 2009/147/EC on the conservation of wild birds (the codified version of Council Directive 79/409/EEC as amended) (Birds Directive);

b. Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive);

c. The Conservation of Habitats and Species Regulations 2017 (as amended);

d. Wildlife and Countryside Act (WCA) 1981 (as amended);

e. Countryside & Rights of Way Act 2000 (as amended);

f. Natural Environment and Rural Communities (NERC) Act 2006 (as amended);

g. The Environment Act 2021;

h. Protection of Badgers Act 1992 (as amended);

i. Hedgerow Regulations 1997 (as amended);

j. Water Environment (Water Framework Directive) (England and Wales) Regulations 2017; and

k. Animal Welfare Act 2006.

Planning Policy

a. Overarching National Policy Statement (NPS) for Energy (EN1), adopted 2011;

b. NPS for Renewable Energy Infrastructure (EN-3), adopted 2011;

a. NPS for Electricity Networks Infrastructure (EN5), adopted 2011;

b. National Planning Policy Framework (NPPF), published July 2021;

c. Planning Practice Guidance (PPG) (2019);

d. PPG, Renewable and Low Carbon Energy (2015);

e. Chelmsford Local Plan 2013-2036, adopted 2020; and

f. Braintree District Council Local Development Plan including saved policies of Braintree District Local Plan Review (2021); and

g. Braintree District Council Local Development Framework Core Strategy (2011).

Other Guidance

a. Priority habitats and species listed on UK Post 2010 Biodiversity Framework which succeeds the UK Biodiversity Action Plan (UK BAP) (Joint Nature Conservation Committee (JNCC) and Defra, 2018);

b. Landscape Institute, Infrastructure Technical Guidance Note 04/20 (2020); and

c. Essex Biodiversity Action Plan; and

d. Essex Design Guide (2018).

Biodiversity Net Gain

1.5.2 It is government policy in NPS EN1 that development proposals provide many opportunities for building-in beneficial biodiversity or geological features as part of good design and that such opportunities in and around developments

should be maximised where appropriate and, in the NPPF 2021, that planning decisions should minimise impacts on and provide net gain for biodiversity.

1.5.3 In addition, the Environment Act 2021 (once the relevant provisions are in operation) includes a mandate for at least 10% Biodiversity Net Gain (BNG) for projects, including for Nationally Significant Infrastructure Projects (NSIPs).

1.5.4 Further information on BNG is provided in the Biodiversity Net Gain Report [**EN010118/APP/6.5**].

1.6 Existing Landscape and Biodiversity Features

Existing Landscape Features

1.6.1 The landscape features within the Order limits consist of agricultural fields mainly under arable production. There are some small parcels of pasture, interspersed with individual trees, hedgerows, tree belts (linear) small woodland blocks and farm access tracks. The hedgerows within the Order limits range between lengths of dense tall vegetation (shrub and tree species) and thin lines of vegetation with sporadic trees present, although the former is a dominant feature. The arable fields are of small to moderate size, some of which are of irregular shape.

1.6.2 The northern part of the Order limits and surrounding area consists of undulating and relatively elevated landform, as part of the River Ter valley. The landform rises steeply northwards from the river and Terling Spring, between 35m Above Ordnance Datum (AOD) to 50m AOD along parts of Braintree Road. It culminates at a ridgeline at 70m AOD at Rank's Green, in the northern part of the Order limits. To the south of the River Ter, the landform also rises steeply, across Sandy Wood, to a ridgeline at 55m AOD.

1.6.3 Most of the central and southern part of the Order limits is located across flat and low-lying landform at approximately 45m AOD, between Waltham Road / Boreham Road and Terling Road.

1.6.4 There is an existing network of public rights of way (PRoW) within the Order limits and across the surrounding area (as shown on the Outline Landscape Masterplan, Annex A).

1.6.5 Other existing infrastructure within the Order limits and surrounding area includes 400kV, 132 kV and 11kV overhead powerlines (OHLs) carried by OHL towers and wooden poles. These extend from the south west of the Order limits to the north west of Boreham, across most of the Order limits and to the west of Sandy Wood, where the alignment of the OHLs diverts to the west and east of Fuller Street.

1.6.6 One section of 11kV OHL, carried on wooden poles and belonging to UK Power Networks will be converted to an underground cable and diverted as detailed in ES Volume 1 Chapter 2: The Scheme.

1.6.7 The existing Bulls Lodge 400kV National Grid substation lies within the south western part of the Order limits, to the west of Brick House Farm and approximately 400m to the north of the A12 carriageway.

1.6.8 None of the land within the Order limits is covered by any statutory landscape designations i.e. Area of Outstanding Natural Beauty (AONB) or statutory heritage designations i.e. Scheduled monuments. There are 73 listed buildings and the registered park and garden of Terling Place within a 1km study area of the Order limits boundary.

Existing Biodiversity Features

1.6.9 The following section summarises the baseline detail for biodiversity, as presented in ***Chapter 8: Ecology***.

Statutory and non-statutory sites

1.6.10 There are several ancient woodlands on the edges of, or surrounded by, the Order limits, and within the surrounding area. Within, or adjacent to the Order limits, these include:

a. Brickhouse Wood, Hookley Wood and Sandy Wood.

b. Scarlett's Wood, Ringer's Wood, Toppinghoehall Wood and Porter's Wood.

c. Scrub Wood and Blake's Wood.

1.6.11 The River Ter SSSI is excluded from the Order limits, located adjacent to the northern boundary.

Habitats

1.6.12 The following notable habitats, presented in **Table** 1-1, were recorded within the Order limits.

Table 1-1: Notable habitats within the Order limits

Habitat type	*Status*
Woodland – broadleaved semi-natural	Habitat of Principal Importance – Lowland Mixed Deciduous Woodland and Wet Woodland. Ancient woodland is a Local Biodiversity Action Plan (LBAP) habitat
Marshy grassland	A component of a Habitat of Principal Importance – Wet Woodland
Standing water	Ponds of certain criteria are a Habitat of Principal Importance
Running water	Rivers are a Habitat of Principal Importance
Cultivated / disturbed land – arable (including arable flora)	Cereal (arable) field margins are an LBAP and Habitat of Principal Importance
Hedgerows	Habitat of Principal Importance and LBAP - Ancient and / or species rich hedgerows and green lanes

Species

1.6.13 With reference to ***Appendix 8C: Flora Report*** **[EN010118/APP/6.2]**, surveys of arable field margins recorded rare or scarce arable flora species in 2019, including a single plant of Corn Chamomile (*Anthemis austriaca*), which is

classified as endangered in the UK and England, (Stroh et al 2015 (Ref 8-29), Mcleod et al 2017) (Ref 8-30). Four other important arable plants of Least Concern in the Red Lists for UK and England also recorded.

1.6.14 With reference to ***Appendix 8D: Aquatic Ecology Report***, no macrophyte species of conservation importance were recorded in any water bodies surveyed; however, four species are classed as uncommon by the FHT: Fine-leaved Water Dropwort (*Oenanthe aquatica*), Common Water-crowfoot (*Ranunculus aquatilis*), Slender Tufted-sedge (*Carex acuta*) and Rigid Hornwort (*Ceratophyllum demersum*). All other macrophyte taxa recorded are classed as Least Concern based on taxa designations and red data lists.

1.6.15 With reference to ***Appendix 8D: Aquatic Ecology Report***, the following records of protected or notable fish species from the River Ter: Brown Trout (*Salmo trutta*), Brook Lamprey (*Lampetra planeri*), Bullhead (*Cottus gobio*) and European Eel (*Anguilla anguilla*). Brown Trout and Bullhead were also observed in the River Ter during the aquatic surveys.

1.6.16 With reference to ***Appendix 8E: Great Crested Newt Survey Report***, Great Crested Newt (*Triturus cristatus*) has been detected in nine water bodies within 500m of the Order limits, with one pond within the Order limits supporting Great Crested Newt.

1.6.17 With reference to ***Appendix 8F: Report on Surveys for Reptiles***, two species of reptile, Common Lizard (*Zootoca vivipara*) and Grass Snake (*Natrix helvetica*), were recorded within 2km of the Order limits but no reptiles were recorded within the Order limits during surveys.

1.6.18 With reference to ***Appendix 8G: Wintering Bird Survey Report***, 76 bird species were recorded during the wintering bird surveys, including notable species such as Skylark (*Alauda arvensis*) and Yellowhammer (*Emberiza citrinella*).

1.6.19 With reference to ***Appendix 8H: Report on Surveys for Breeding Birds*** a breeding bird assemblage of 66 species was recorded within the Order limits, with a breeding assemblage of 54 species, including territories of Hobby (*Falco subbuteo*), Barn Owl (*Tyto alba*) and Tree Sparrow (*Passer montanus*).

1.6.20 With reference to ***Appendix 8I: Report on Surveys for Bats***, surveys of bat activity (depending on the season and location) recorded at least eight species; Common Pipistrelle (*Pipistrellus pipistrellus*), Soprano Pipistrelle (*Pipistrellus pygmaeus*), Noctule (*Nyctalus noctula*), Leisler's bat (*Nyctalus leisleri*), Daubenton's bat (*Myotis daubentoniid*), Myotis species (Daubenton's bat or other unidentified species), Brown Long-eared bat (*Plecotus auritus*), Serotine (*Eptesicus serotinus*) and Barbastelle (*Barbastella barbastellus*).

1.6.21 With reference to ***Appendix 8J: Badger Survey Report***, seventeen Badger (*Meles meles*) setts, (fifteen in active use), were identified within the survey area in 2020, with an additional four Badger setts identified along the cable route in 2021. Of the 21 setts recorded, 18 were active and are located with the Order limits.

1.6.22 With reference to ***Appendix 8L: Report on Surveys for Riparian Mammals***, Otter (*Lutra lutra*) was recorded occasionally using the River Ter.

2. Landscape and Ecology Strategy

2.1 Landscape Strategy

2.1.1 Good design has been a key consideration from the outset. The EIA has informed the iterative design process, guided by design principles developed specifically to address the opportunities and constraints presented by the Scheme. These principles have been developed in response to policy requirements, published landscape character assessment guidance and fieldwork analysis.

2.1.2 With reference to the Outline Landscape Masterplan (see Annex A), the following design mitigation has been embedded in the Scheme to minimise effects on the environment, including landscape character, visual amenity, biodiversity, and heritage assets.

2.1.3 In developing the landscape design strategy, particular consideration was given to:

a. The recommendations contained within relevant landscape guidelines, including Natural England Statements of Environmental Opportunity (SEO) outlined in the profiles for NCA 86 (Ref. 1) and NCA 111 (Ref. 2);

b. Guidance contained within the Landscape Institute's Infrastructure Technical Guidance Note 04/20 (Ref. 3);

c. The principles established in the Essex Design Guide (Ref 4);

d. Suggested land management guidelines set out in the Braintree, Brentwood, Chelmsford, Maldon And Uttlesford Landscape Character Assessment (2006) (Ref. 5) for LCA B17, in which the northern part of the Order limits are located. These are stated as:

- *"Conserve and enhance the existing hedgerow pattern, and strengthen through planting where appropriate to local landscape character.*
- *Conserve and manage areas of semi-natural woodland as important historical, landscape and nature conservation features.*
- *Conserve and manage the ecological structure of woodland, copses and hedges within the character area.*
- *Conserve and promote the use of building materials, which are in keeping with local vernacular/landscape character."*

e. Suggested land management guidelines set out in the Braintree, Brentwood, Chelmsford, Maldon And Uttlesford Landscape Character Assessment (2006) (Ref. 5) for LCA B21, in which the northern part of the Order limits are located. These are stated as:

- *"Conserve and enhance the existing hedgerow pattern, and strengthen through planting where appropriate to local landscape character.*
- *Conserve and manage areas of ancient and semi-natural woodland as important historical, landscape and nature conservation features.*

- *Conserve and manage the ecological structure of woodland, copses and hedges within the character area.*
- *Strengthen the recreational role of the water filled sand and gravel pits.*
- *Conserve and promote the use of building materials, which are in keeping with local vernacular/landscape character."*

2.1.4 The overall objective of the landscape design is to integrate the Scheme into its landscape setting and avoid or minimise adverse landscape and visual effects as far as practicable. The design achieves this objective whilst maximising opportunities to deliver net gains in biodiversity. Accordingly, the landscape design aims to achieve the following:

- To integrate the Scheme into the existing landscape pattern as far as possible by retaining and following existing features, including vegetation, where practicable.
- To replace habitat lost because of construction of the Scheme and introduce new habitats through areas of new planting.
- To filter and screen more prominent components of the Scheme in views from visual receptors.

2.1.5 Details of the landscape measures embedded into the Scheme design, including a summary of their environmental functions and objectives, is presented in ***Chapter 2: The Scheme*** and ***Chapter 3: Alternatives and Design Evolution.***

2.2 Overview landscape design principles

2.2.1 This section describes the landscape design principles which underpin the landscape design strategy and explains how they have been applied to the design of the Scheme.

Careful siting in the landscape:

2.2.2 Offsets from properties were included in the initial design following a review of the existing views experienced by residents in proximity to the Order limits. The form and extent of this offset has been adjusted through design development to respond to the existing character of views from residential properties. With reference to the Design Principles and Works Plan [**EN010118/APP/2.2**] the Scheme design has been carefully sited where it would appear in views experienced by residents to avoid or minimise adverse effects, as set out in **Table** 2-1 below.

Table 2-1: Embedded Design Mitigation - Residential Receptors

Residential receptor	*Embedded design mitigation*
White House Farm	The historic field boundary that divides the western end of PDA 4 would be reinstated with a new native hedgerow. No PVs are proposed in the western parcel of the field, thereby retaining a clear view north from White House Farm. A native tree belt is proposed on the northern boundary of PDA 5 to strengthen the screening provided by existing vegetation in views to the south east.

Residential receptor	*Embedded design mitigation*
1 Whitehouse Cottages	An offset of c. 70m has been incorporated into PDA 5, protecting gable end views from 1 Whitehouse Cottages.
2 Whitehouse Cottages	A 50m offset has been incorporated into PDA 6. A hedgerow is proposed along the boundary of Works Area 1
Scarlett's Farm	Field parcels to the north and south have been excluded from Works Area 1.
Hedgerow Cottage	Field south of PDA 6 have been excluded from Works Area 1
Noakes Barn	Field south of PDA 6 has been excluded from Works Area 1 and an offset from the north eastern curtilage boundary has been incorporated, with a native hedgerow proposed along the boundary of PDA 8.
1 Boreham Road	Offset incorporated to PDA 21 in response to gaps in vegetation around the curtilage of the property.
Stocks Farm	Offset of Work Area 1 incorporated into PDA 26 and PDA 28.
Stocks Cottages	Offset of Work Area 1 incorporated into PDA 28. Areas of scrub are proposed in Works Area 10 to break up the foreground of the view.
Thatched Cottage	Offset of Work Area incorporated into PDA 28. Ecologically enhanced grassland to occupy an offset within Works area 10
Buftons	200m viewing corridor within Works Area 1 between PDA 28 and 31 to retain visual connection to Porters Wood.

2.2.3 The following principles have also informed the siting and design of the Scheme. Further details can be found in ***Chapter 3: Alternatives and Design Evolution:***

a. The overall layout has undergone extensive review and refinement to respond to the landscape character baseline. The northern part of the Order limits is identified as the most tranquil. Larger elements of the Scheme have therefore been sited in the southern parts of the Order limits.

b. The Battery Energy Storage System (BESS), Work Area 2 would be sited in a visually contained section of the Order limits, enclosed and screened by Toppinghoehall Wood North and Toppinghoehall Wood South. The BESS has been sited in double rows, rather than stacked, and would follow the existing shape of the woodland, avoiding the creation of a new mass within the landscape.

c. The proposed Longfield Substation (Work Number 4) would be enclosed by Toppinghoehall Wood North and Toppinghoehall Wood South and Lost Wood to maximise visual screening.

d. The Ter River valley is identified as one of the most sensitive landscape features. Although within the Order limits, the extent of Work Area 1 has been minimised within the valley in order to protect and conserve the

integrity of this area. The part of the Order limits in this area would be used for visual screening and ecological enhancement as set out in the ***Outline Landscape Masterplan, Annex A***.

e. Small fields have been excluded from the Solar PV Array Works Area, BESS Compound, Longfield Substation and Ancillary Infrastructure Area, responding to the existing scale of the landscape and the careful siting of the Scheme.

Conserving existing vegetation patterns

f. The layout of the Scheme has been designed to minimise the loss of, and avoid significant impacts on, existing landscape features. With reference to the Works Plans this includes minimum offsets of:

i. 15m from ancient woodland;

ii. 15m from other woodland;

iii. 15m from hedgerows;

iv. 15m from individual trees;

v. 10m from existing ponds

vi. 8m from the River Ter floodplain

g. An offset has been included along Boreham Road to provide space for enhancing existing hedgerows in response to landscape planning policy and character objectives and to strengthen visual screening.

h. The proposed cable route has been designed to minimise disturbance of existing vegetation. Where selective vegetation removal is required, replacement planting would be established above the cable route.

i. The proposed planting design responds to the varied character of the landscape within the Order limits by allowing views to remain open, where tall screening would not be appropriate.

Creating new green infrastructure

2.2.4 The Scheme has been designed to integrate with the local green infrastructure network, improving ecological and recreational connectivity across the Order limits.

2.2.5 With reference to Figure 10-14 of the ES **[EN010118/APP/6.3]**, new planting proposed as part of the Scheme would be delivered in three phases. Where it was found to be beneficial to undertake planting early, in order to maximise growth prior to the Scheme's operation, this has been included as Advanced Mitigation Planting. This will be carried out in the 2021/2022 planting season. In instances where planting required to mitigate adverse effects on people's views could not be undertaken in 2021/2022, it would be undertaken at the beginning of the construction phase. This planting is referred to as Construction Day 1 Planting. All remaining planting, referred to as Residual Mitigation Planting, would be undertaken at the end of the construction phase.

2.2.6 New planting would include:

- 8.6km of new native hedgerows with hedgerow trees;

- 20.6km of native hedgerow enhancement - gapping up and infill planting;
- Approximately 200 new individual trees;
- 23.2ha of land for natural regeneration;
- Over 3ha. of new native woodland buffer planting measuring 25m wide to form ecological corridors between existing woodlands;
- 0.6ha. of native linear tree belts measuring 15m wide;
- A new north/south green route, via a new permissive path;
- 272ha. of new species rich grassland below solar arrays;
- 131ha. of new species rich grassland in open areas; and
- 42km of species rich mown grassland around the perimeter of proposed solar arrays.

2.3 Ecology Strategy

2.3.1 The ecology strategy is based on the embedded mitigation required for a number of ecological receptors where low adverse impacts and minor or negligible effects has been identified during construction within ***Chapter 8: Ecology***. The following ecological receptors and a summary of the strategy is provided below:

a. Replacement and additional hedgerow planting, due to a minor temporary loss of hedgerows within the Order limits (for access and grid connection cables only);

b. Replacement of, and increase in, habitats (e.g. grassland) based on a temporary loss of habitat used by the breeding bird assemblage (e.g. skylark) across the Scheme, and subsequent enlargement of habitat through embedded mitigation in the Scheme design;

c. Increase in buffer habitats (e.g. around woodlands), foraging habitats (e.g. grassland) and barn owl boxes to mitigate a temporary disturbance to breeding Red Kite, Hobby and Barn Owl; and

d. Provide a significant positive benefit to biodiversity in the medium to long-term. The ecology strategy is predicted to achieve a 79% gain in habitat units based on the assessment presented in the Biodiversity Net Gain Report. This includes new areas of grassland within and surrounding solar PV panels.

Impact Avoidance

2.3.2 The impact avoidance measures outlined below would be implemented, as relevant and appropriate, prior to and during construction, the purpose being to minimise the impact of works on biodiversity features and to achieve legislative compliance.

2.3.3 Standard environmental best practice and mitigation will be implemented so that construction and operation of the Scheme complies with legislation relating to protected species. It would also ensure the Scheme does not compromise the local conservation status of ecological receptors present within or in the vicinity of the Scheme. Where protected species licences are required (none currently required), these would be obtained from Natural

England sufficiently in advance of the works to meet with the optimum time for mitigation and to minimise any changes to the construction programme.

2.3.4 The impact avoidance approach secures the retention of trees to maintain the connectivity of the existing green infrastructure network.

2.3.5 Design principles that have been applied to avoid and/ or reduce potential ecology and nature conservation effects include:

a. Creating undeveloped buffers to protect hedgerows, veteran/ancient trees, ponds and ancient woodland during construction and operation. Natural regeneration of woodland will create additional scrub and woodland habitat within some of these areas whilst others will be managed as grassland.

b. Tree Root Protection Area fencing will be erected around retained trees, in line with British Standard BS 5837: Trees in relation to design, demolition and construction.

c. Ensuring that the existing designated site, the Boreham Road Gravel Pits Local Wildlife Site (LoWS) which lies within the Order limits is retained, and measures are embedded within the Scheme design to ensure that ecology is not impacted during construction, e.g. through siting construction routes away from and outwith the LoWS or using measures (such as the use of Horizontal Directional Drilling (HDD)) to minimise any temporary habitat loss during construction;

d. Ensuring that existing priority habitats (including woodland, veteran trees, marshy grassland, hedgerows, running water and ponds) are avoided, where reasonably practicable, and compensated for where not, through habitat creation and replacement; and

e. Habitat planting and reinstatement replaces any habitat temporarily damaged, or permanently lost as a result of the Scheme.

Updated Surveys

2.3.6 An ecologist will complete a Scheme walkover in advance of construction works to reconfirm the ecological baseline conditions and to identify any new ecological risks. The walkover will be completed sufficiently far in advance of the works to allow for the completion of any additional, seasonally constrained surveys (e.g. surveys in support of any identified requirements for protected species licences) that may be required. These surveys will be undertaken in advance of the preparation of the detailed LEMP and the Plan will be developed in line with the findings of these surveys.

2.3.7 Immediately prior to site clearance and start of construction, further site walkover surveys will be undertaken by an ecologist to confirm that the risks associated with the Scheme remain as previously assessed and, or to confirm the correct impact avoidance measures are being implemented (e.g. tree protection fencing, protected species stand-offs and other protection measures).

2.3.8 The scope of the required walkovers will be defined on a case by case basis in consultation with the project team, based on the specific risks associated

with the Scheme and informed by the preceding ecological walkover described above.

2.3.9 Should any new constraints be identified as a result of the updated surveys, these would be captured in the detailed LEMP. Any additional impact avoidance or mitigation requirements would be identified in consultation with the project team and/or the relevant statutory consultees. Implementation of these measures is proposed to be secured by a requirement of the draft DCO.

2.3.10 Any additional surveys would be recommended as necessary by the ecologist, based on professional judgement and the findings of the updated walkover surveys, or identified as appropriate by LSF or their contractor(s). These may be required, for example, based on the construction programme, working requirements or following identification of specific issues and constraints not covered by previous advice.

Protected Species Licences

2.3.11 No protected species licences are currently required although the need for such (e.g. for Badger), prior to construction, will be informed by the updated surveys prior to construction (as above).

2.3.12 All necessary protected species licences would be applied for and obtained prior to undertaking any works that might result in offences under the relevant legislation.

Ecological Clerk of Works

2.3.13 The scope of the Ecological Clerk of Works (ECoW) would be advised by the ecologist based on relevant environmental commitments, the findings of the updated surveys, protected species licensing requirements and with reference to the relevant project programmes.

2.3.14 Relevant site staff would receive toolbox talks as necessary from the ECoW on the relevant ecological risks present, legal requirements, and the working requirements necessary to comply with legislation, and the final approved landscaping and biodiversity management and enhancement measures. Toolbox talks would be repeated as necessary over the duration of the works.

Tree Works

2.3.15 The location of the Scheme would largely avoid the need for the removal of mature trees across the Order limits. Some removal and pruning of mature trees may be required to facilitate vehicle access during construction, and for the construction of the Grid Connection Route.

2.3.16 Where works in close proximity to retained trees cannot be practicably avoided, these works would be undertaken in accordance with current best practice at the time of the works. In February 2022, current best practice is defined in:

a. British Standard (BS) 5837: 2012 Trees in relation to design, demolition and construction – Recommendations; and

b. National Joint Utilities Group (NJUG) Guidelines for the Planning, Installation and Maintenance of Utility Apparatus in Proximity to Trees.

2.3.17 All necessary protective fencing would be installed prior to the commencement of any site clearance or construction works. This would be set out in Arboricultural Reports and Arboricultural Method Statements prepared pre-construction, pursuant to the DCO.

Hedgerow Works

2.3.18 The layout of the Scheme has been designed to minimise the loss of, and avoid significant impacts on, existing landscape features. The total proposed hedgerow loss is 450.6m and the total proposed woodland loss is 469.1m_2. The extent of vegetation removal is limited to these extents by the Design Principles and is as set out on **Figure 10-15 Vegetation Removal Plan**.

Precautionary Working Method

2.3.19 Precautionary working methods would be adopted to minimise potential adverse effects on protected/notable species prior to and during construction. Precautionary working method statements would be produced as necessary to specify working requirements and other necessary impact avoidance measures. These measures would be controlled and implemented through the detailed CEMP(s) produced pre-construction, pursuant to the DCO.

Animal Welfare Requirements

2.3.20 Construction excavations have the potential to trap wildlife, such as badger and otter, and result in offences under animal welfare legislation. This would be avoided through implementation of simple precautionary mitigation. All excavations deeper than 1m would be covered or fenced overnight, or where this is not practicable, a means of escape would be fitted (e.g. battered soil slope or scaffold plank), to provide an escape route should any animals stray into the construction site and fall into an excavation.

2.4 Stakeholder Engagement

2.4.1 The OLEMP has been developed in consultation with representatives of the Local Planning Authorities. The OLEMP engagement, including feedback received, is outline in **Table** 2-1 below.

Table 2-2: Main matters raised during consultation

Consultee	*Main matter raised*	*How has the concern been addressed*
Local Authorities	The proposed species mixes for hedgerows, tree belts and woodland buffers were discussed with the Local Authorities, represented by Wynne Williams Associates during a site meeting held on 5th October 2021. Email correspondence (15th October 2021)	The additional species were discussed with the ecology team, the landowner and their commercial availability from plant nurseries reviewed. Malus sylvestris, Viburnum opulus and Rosa canina have been incorporated into the proposed species mixes. Prunus domestica is not commercially available but has been recorded on site as has Sambucus nigra, a species identified in guidance from the Essex Wildlife Trust. Both are considered species which will colonise naturally. Concern was expressed that planting either, may lead to the species becoming

Consultee	Main matter raised	How has the concern been addressed
	from Wynne Williams proposed additional species: Malus sylvestris, Prunus domestica, Rosa canina and Viburnum opulus to be included into the mixes.	dominant reducing species diversity. The Outline Landscape Masterplan identifies areas for Natural Regeneration, where these species could colonise. The management regime for the Natural Regeneration areas will monitor the diversity of species in these areas. This approach to the additional species was agreed with the Local Authorities, represented by Wynne Williams Associates at a meeting held on 16 December 2021.
Local Authorities	The structure of the OLEMP and information contained within was discussed with the Local Authorities, represented by Wynne Williams Associates at a meeting held on 16 December 2021. Wynne Williams Associates asked how the natural regeneration areas would be managed and how the proposed planting could be changed as part of the decommissioning, in particular the new field pattern that would be established.	The natural regeneration areas identified in the Outline Landscape Masterplan are to receive minimal management. The areas will be monitored, and management adapted to maintain the desired composition and function as set out in this OLEMP. On decommissioning the established planting would not be removed. Only the built elements would be removed. Control of the site would be handed back to the landowner.
Local Authorities	The species mixes previously discussed and agreed with the Local Authorities represented by Wynne Williams Associates, were discussed with the Essex County Ecologist, Hamish Jackson. No concern was raised.	No further action.

3. Management Prescriptions

3.1 Introduction

3.1.1 This section describes how existing and new habitats illustrated on the Outline Landscape Masterplan in Annex A will be protected or implemented during construction, maintained during the first five years following implementation and managed in the long term until decommissioning of the solar farm.

3.1.2 The retained existing and new landscape types illustrated on the Outline Landscape Masterplan, Annex A are:

a. Existing retained trees and shrubs (including existing hedgerows with trees, woodland and mature trees);

b. Hedgerow with trees;

c. Woodland (including woodland buffers and tree belts);

d. Individual trees;

e. Scrub;

f. Species-rich grassland;

g. Natural regeneration; and

h. Wetland planting around ponds.

3.2 Native planting

3.2.1 The following steps and working methods will be included in the specification:

a. Areas identified for planting will be clearly marked out and agreed with the Landscape Clerk of Works (LCoW) in advance.

b. Planting will take place in the first available planting season and at a time of the year appropriate to the species being planted.

c. Plants will be inspected by the LCoW at the nursery and on delivery to site prior to planting.

d. Planting will be timed to avoid periods of frost, drought, or other inclement weather, as far as practicable.

e. Plants will be planted in double staggered row at 5 plants per metre in single species groups of 3, 5 or 7's. Specimen trees to be planted at 10m intervals as hedgerow trees.

f. Plants will be protected from strimming activities and damage from animals with individual biodegradable spiral guards, supported by a bamboo cane for hedgerow plants or double staked 300x60cm weld mesh guard for specimen trees. The type of guard selected appropriate to species and growth habit.

g. Trees will be staked to protect against wind-rock.

3.3 Existing retained trees and shrubs

3.3.1 Existing hedgerows with trees, woodland and mature trees within the Order limits will be retained, as indicated on the Outline Landscape Masterplan in Annex A.

Function

3.3.2 The primary function of the retained trees and shrubs will be to maintain established habitats, visual amenity and character of the landscape and provide a structure for the addition of the new planting and other features of the solar farm development.

Implementation

3.3.3 During construction the retained hedgerows, woodland and trees will be protected. Measures to be employed will include the use of clearly defined stand-offs, managing the structure and integrity of the retained vegetation, and undertaking any pruning outside of the bird breeding season.

3.3.4 Retained trees will be periodically inspected by an arboriculturist during construction. Where construction works are adjacent to retained trees, works will be undertaken under a watching brief to record root loss and to recommend further arboricultural works where required.

3.3.5 Where required, gaps in retained hedgerows will be planted to reinforce the integrity of the hedgerow. Planting details are provided under hedgerow with trees below.

3.3.6 A 15m grassland buffer will be maintained around retained individual trees and bird boxes will be installed. Management of the grassland buffer and the type of bird boxes is detailed under species-rich grassland and habitat boxes below.

Long term management

3.3.7 Long term management of existing retained vegetation is provided under the specific landscape types below.

3.4 Hedgerow with trees

3.4.1 New hedgerows with trees will be established to supplement the existing, retained hedgerows with trees.

Function

3.4.2 Hedgerows with trees provide both a valuable habitat, forming important wildlife corridors and a visual screening function. Hedgerow height is important to screen views and the hedgerows will be maintained at a minimum of 3m high and ‘infilled’ where there are gaps in existing hedgerows.

Implementation

3.4.3 The locations for proposed hedgerows with trees and hedgerows requiring ‘gapping up’ are illustrated on the Outline Landscape Masterplan Annex A.

3.4.4 A specification for hedgerows will be developed based on the indicative species, sizes and percentages presented in **Table 3-1**. Larger stock will be

used for individual trees within hedgerows, with reference to the species set out in **Table 3-4**.

Table 3-1: Indicative mix for hedgerows

Botanical name	Common name	Height	Root	Form	% Mix
Acer campestre	Field maple	40-60cm	Bare root	Transplant	15
Cornus sanguinea	Dogwood	40-60cm	Bare root	Transplant	10
Corylus avellana	Hazel	40-60cm	Bare root	Transplant	5
Crataegus monogyna	Hawthorn	40-60cm	Bare root	Transplant	20
Euonymus europaeus	Spindle	40-60cm	Bare root	Transplant	5
Ilex aquifolium	Holly	40-60cm	Container grown	2ltr pot	10
Malus sylvestris	Crab apple	40-60cm	Bare root	Transplant	5
Prunus spinosa	Blackthorn	40-60cm	Bare root	Transplant	20
Rosa canina	Dog Rose	40-60cm	Bare root	Transplant	5
Ulmus procera *(Disease resistant variety)*	Elm	40-60cm	Bare root	Transplant	5

Establishment maintenance

3.4.5 A detailed plan for the establishment and management of new hedgerows will be developed for the five year establishment maintenance period.

3.4.6 The aim of establishment maintenance will be to support the early stages of growth to encourage the canopy to close, reducing future management requirements to address competition from weeds. This is based on the following principles and outline prescriptions:

a. Maintain a 0.5 metre weed free strip either side of hedgerow and a 1 metre weed-free circle around trees through chemical and mechanical control.

b. Water new plants to minimise failures in periods of drought.

c. Remove litter, rubbish, and debris from planted areas throughout the year.

d. Re-firm soil around roots to ensure plants are supported and upright in spring each year.

e. Inspect and adjust guards in spring and autumn.

f. Check and record failed or defective plants in September annually

g. Replace failed or defective plants with matching species of the same size during the next planting season after failure

h. LCoW to undertake a quarterly check of plants to record their growth and condition.

i. Trim hedge in November and December in the fifth maintenance year to promote bushy growth.

Long term management

3.4.7 The long-term management of new and existing, retained hedgerows will focus on the following interventions:

a. Hedgerows will be managed on a three-year rotation with only one side of the hedgerow cut in any one year to help develop the hedgerow structure.

b. Cutting will be carried out at the end of the winter in February, thereby retaining berries through the winter months for wildlife and avoiding the bird breeding season.

c. If managed by traditional techniques such as hedgerow laying, this will be carried out on a rotational basis to retain the structural integrity of hedgerows and maintain connections with other habitats.

d. Overgrowing or overhanging branches will be removed from any pathways to keep them unobstructed.

e. Dead, over-mature or dying hedgerow trees will be subject to removal where they are considered dangerous on health and safety grounds, and in accordance with any protected species constraints.

f. Monitoring will be undertaken to detect any significant changes in hedgerow health and condition. Checks will be made every three years, using fixed-point photography.

3.5 Woodland – Woodland buffers and native tree belts

3.5.1 Woodland buffers and native tree belts will be established to reinforce the retained existing woodland and tree belts.

Function

3.5.2 Native tree belts are proposed in areas too narrow to be planted as woodland but at 10 to 15 metres width will provide a more substantial visual screen than a hedgerow with specimen trees.

3.5.3 Woodland buffers and native tree belts are characteristic of the existing landscape and provide ecological value, forming important wildlife corridors between existing woodlands. They also act as visual screens.

3.5.4 Trees will be managed to achieve their maximum mature height for the species.

Implementation

3.5.5 The locations of proposed native tree belts and woodland buffers are illustrated on the Outline Landscape Masterplan in Annex A.

3.5.6 A specification for native tree belts and woodland buffers will be developed based on the indicative species, sizes and percentages presented in **Table** 3-2 and**Table** 3-3.

Table 3-2: Indicative species mix for woodland buffers (25m wide)

Botanical name	*Common name*	*Height*	*Root*	*Form*	*% Mix*
Acer campestre	Field maple	180-250cm	Root ball	Feather	15
Carpinus betulus	Hornbeam	180-250cm	Root ball	Feather	10
Cornus sanguinea	Dogwood	40-60cm	Bare root	Transplant	10
Corylus avellana	Hazel	40-60cm	Bare root	Transplant	5
Crataegus monogyna	Hawthorn	40-60cm	Bare root	Transplant	10
Ilex aquifolium	Holly	40-60cm	Container grown	2ltr pot	5
Prunus avium	Wild cherry tree	180-250cm	Root ball	Transplant	10
Prunus spinosa	Blackthorn	40-60cm	Bare root	Transplant	5
Quercus robur	Oak	180-250cm	Root ball	Feather	15
Sorbus torminalis	Wild Service Tree	180-250cm	Root ball	Feather	10

Table 3-3: Indicative mix for tree belts (10-15m wide)

Botanical name	*Common name*	*Height*	*Root*	*Form*	*% Mix*
Acer campestre	Field maple	40-60cm	Bare root	Transplant	15
Carpinus betulus	Hornbeam	180-250cm	Root ball	Feather	15
Cornus sanguinea	Dogwood	40-60cm	Bare root	Transplant	5
Corylus avellana	Hazel	40-60cm	Bare root	Transplant	5

Crataegus monogyna	Hawthorn	40-60cm	Bare root	Transplant	10
Prunus avium	Wild cherry tree	180-250cm	Root ball	Feather	15
Prunus spinosa	Blackthorn	40-60cm	Bare root	Transplant	5
Quercus robur	Oak	180-250cm	Root ball	Feather	15
Sorbus aucuparia	Rowan	40-60cm	Bare root	Transplant	15

3.5.7 The following steps and working methods will be included in the specification:

a. Areas identified for planting will be clearly marked out and agreed with the LCoW in advance.

b. Planting will take place in advance of construction or in the first available planting season

c. Plants will be inspected by the LCoW at the nursery and on delivery to site prior to planting.

d. Planting will be carried out in winter (November to March) and will be timed to avoid periods of frost, drought, or other inclement weather, as far as practicable.

e. Root ball 'feather' species will be planted at 4.5m centres in single species groups of 3, 5 or 7's.

f. Bare root 'transplants' will be planted randomly within the plot at 3m centres in single species groups of 7's, 9's and 11's.

g. 'Feathers' and 'transplants' will be planted in mixed groups; the groups will be laid out in such a way as to avoid repetition and clumping of same species groups. Planting layouts will appear to be random and will avoid straight lines and regular geometric patterns.

h. Transplant planting will be protected from strimming activities and damage from animals with individual biodegradable spiral guards, supported by a bamboo cane.

i. Root ball planting will be protected by single staked 180x30cm weld mesh guard.

j. The type of guard selected appropriate to species and growth habit.

k. Trees will be staked to protect against wind-rock.

Establishment Maintenance

3.5.8 A detailed plan for the establishment and management of new woodland buffers and native tree belts will be developed for the five year establishment maintenance period.

3.5.9 The aim of establishment maintenance will be to support the early stages of growth to encourage busy growth and the canopy to close, reducing future

management requirements to address competition from weeds. The trees and shrubs will be maintained in line the recommendations of a LCoW.

3.5.10 Establishment maintenance will be based on the following principles and outline prescriptions:

a. Maintain a 1 metre weed-free circle around trees and shrubs through mechanical control.

b. Water new plants to minimise failures in periods of drought.

c. Remove litter, rubbish, and debris from planted areas throughout the year.

d. Re-firm soil around roots to ensure plants are supported and upright in Spring.

e. Inspect and adjust guards, ties and stakes in Spring and Autumn and after strong wind events.

f. Check and record failed or defective plants in September annually

g. Replace failed or defective plants with matching species of the same size during the next planting season after failure

h. Undertake quarterly check of plants to record their growth and condition.

Long term Management

3.5.11 The long-term management of new and existing woodland, woodland buffers and native tree belts will focus on the following interventions:

a. All woodland, woodland buffer and native tree belt planting plots will undergo an annual condition assessment and an appropriate programme of works developed to address changes in condition and site requirements.

b. From year 5 onwards, guards, ties and stakes will be removed from plants.

c. Between years 7 and 10, planted areas will be reviewed and thinned out as necessary to remove any poor or weak specimens, which will facilitate other specimens to flourish and provide space for trees and shrubs to further establish.

d. The understorey of woodland, woodland buffers and native tree belts will be coppiced in stages to minimise disturbance to wildlife, as required, as part of good woodland management.

e. Arisings from thinning or other woodland management functions will be retained on site in the form of dedicated brash and wood piles or wind-rows, for the benefit for fungi, lichen, and invertebrates.

f. Where necessary, arisings from woodland management will be chipped and spread to a depth no greater than 75mm in woodland areas.

g. Trees adjacent to public rights of way will be actively maintained and monitored on health and safety grounds, and to maintain access.

3.6 Individual trees

3.6.1 Individual trees will be planted along field boundary edges to supplement the retained individual trees.

Function

3.6.2 Mature trees are a characteristic feature of the landscape as both individual trees within fields or as linear rows of trees, marking tracks and field boundaries. These trees provide habitat diversity, and in some locations, visual screening.

Implementation

3.6.3 The locations for proposed individual trees are illustrated on the Outline Landscape Masterplan, Annex A.

3.6.4 A specification for individual trees will be developed based on the indicative species, sizes and percentages presented in **Table** 3-4.

Table 3-4: Indicative mix for individual trees

Botanical name	*Common name*	*Height*	*Root*	*Form*	*% Mix*
Acer campestre	Field maple	300-400cm	Root ball	Selected Standard	15
Carpinus betulus	Hornbeam	300-400cm	Root ball	Selected Standard	10
Crataegus monogyna	Hawthorn	300-400cm	Root ball	Selected Standard	10
Prunus avium	Wild cherry tree	300-400cm	Root ball	Selected Standard	15
Quercus robur	Oak	300-400cm	Root ball	Selected Standard	20
Sorbus aucuparia	Rowan	300-400cm	Root ball	Selected Standard	15
Sorbus torminalis	Wild service tree	300-400cm	Root ball	Selected Standard	15

3.6.5 The following steps and working methods will be included in the specification:

a. Areas identified for tree planting will be clearly marked out and agreed with the LCoW in advance.

b. Planting will take place in advance of construction or in the first available planting season.

c. Plants will be inspected by the LCoW at the nursery and on delivery to site prior to planting.

d. Planting will be carried out in winter (November to March) and will be timed to avoid periods of frost, drought, or other inclement weather, as far as practicable.

e. Plants will be protected from strimming activities and damage from animals by double staked 300x60cm weld mesh guard. The type of guard selected appropriate to species and growth habit.

f. Trees will be staked to protect against wind-rock.

g. Mulch will be applied around the tree to create a 1 metre weed-free area.

Establishment maintenance

3.6.6 A detailed plan for the establishment and management of new native trees will be developed for the five year establishment maintenance period.

3.6.7 The aim of establishment maintenance will be to support bushy growth and the development of a form characteristic of the species at maturity. The trees should be maintained in line with the recommendations of the LCoW.

3.6.8 Establishment maintenance will be based on the following principles and outline prescriptions:

a. Maintain a 1 metre weed-free circle around trees through mechanical control.

b. Water new plants to minimise failures in periods of drought.

c. Remove litter, rubbish, and debris from around the trees throughout the year.

d. Re-firm soil around roots to ensure trees are supported and remain upright in Spring.

e. Inspect and adjust guards, ties and stakes in Spring and Autumn and after strong wind events.

f. Inspect and top-up mulch as required.

g. Undertake any formative pruning if required.

h. Check and record failed or defective trees in September annually

i. Replace failed or defective trees with matching species of the same size during the next planting season after failure

j. Undertake quarterly check of trees to record their growth and condition.

Long term management

3.6.9 Individual trees will be managed according to best arboricultural practice in accordance with:

a. BS 8545:2014 Trees: from nursery to independence in the landscape.

b. BS3998 is the British Standard for Tree Work – Recommendations.

3.6.10 The long-term management of new and existing specimen trees will focus on the following interventions:

a. All specimen trees will undergo an annual condition assessment and an appropriate programme of works developed to address changes in condition and site requirements.

b. From year 5 onwards, guards, ties and stakes will be removed from new specimen trees if they have fulfilled their intended purpose, e.g. guards will be removed once the risk of bark damage from grazing animals has reduced.

c. Formative pruning of trees will be undertaken if required under the direction of an arboriculturist.

d. Trees adjacent to public rights of way will be actively maintained and monitored on health and safety grounds, and to maintain access.

3.7 Scrub

3.7.1 Scrub composed of native shrubs is proposed adjacent to hedgerows to increase the shrub habitat and enhance biodiversity.

Function

3.7.2 The primary function of the shrub planting is to create and maintain a diverse mosaic of scrub and grassland habitat. This includes providing shelter and food resources for birds and other wildlife.

Implementation

3.7.3 The locations for proposed scrub are illustrated on the Outline Landscape Masterplan Annex A.

3.7.4 A specification for scrub will be developed based on the indicative species, sizes and percentages presented in **Table** 3-5.

Table 3-5: Indicative mix for scrub

Botanical name	*Common name*	*Height*	*Root*	*Form*	*% Mix*
Acer campestre	Field maple	40-60cm	Bare root	Transplant	15
Cornus sanguinea	Dogwood	40-60cm	Bare root	Transplant	10
Corylus avellana	Hazel	40-60cm	Bare root	Transplant	5
Crataegus monogyna	Hawthorn	40-60cm	Bare root	Transplant	15
Ilex aquifolium	Holly	40-60cm	Container grown	2ltr pot	10
Malus sylvestris	Crab apple	40-60cm	Bare root	Transplant	5
Prunus spinosa	Blackthorn	40-60cm	Bare root	Transplant	15

Rosa canina	Dog Rose	40-60cm	Bare root	Transplant	5
Ulmus procera *(disease resistant variety)*	Elm	40-60cm	Bare root	Transplant	10
Viburnum opulus	Guelder Rose	40-60cm	Bare root	Transplant	5

3.7.5 The following steps and working methods will be included in the specification:

a. Areas identified for scrub planting will be clearly marked out and agreed with the LCoW in advance.

b. Planting will take place in advance of construction or in the first available planting season

c. Plants will be inspected by the LCoW at the nursery and on delivery to site prior to planting.

d. Planting will be carried out in winter (November to March) and will be timed to avoid periods of frost, drought, or other inclement weather, as far as practicable.

e. Plants will be planted randomly at 1.5m centres in single species groups of 7's, 9's and 11's.

f. Plants will be protected from strimming activities and damage from animals with individual biodegradable spiral guard supported on a bamboo cane. The type of guard selected appropriate to species and growth habit.

Establishment Maintenance

3.7.6 A detailed plan for the establishment and management of new scrub will be developed for the five year establishment maintenance period.

3.7.7 The aim of establishment maintenance will be to support the early stages of growth to encourage bushy growth and the canopy to close, reducing future management requirements to address competition from weeds. Maintenance works will to be planned to avoid the nesting bird season.

3.7.8 Establishment maintenance will be based on the following principles and outline prescriptions:

a. Maintain a 1 metre weed-free circle around shrubs through mechanical control.

b. Water new plants to minimise failures in periods of drought.

c. Remove litter, rubbish, and debris from planted areas throughout the year.

d. Re-firm soil around roots to ensure plants are supported and upright in Spring.

e. Inspect and adjust guards in spring and autumn.

f. Check and record failed or defective plants in September annually

g. Replace failed or defective plants with matching species of the same size during the next planting season after failure

h. Undertake quarterly check of plants to record their growth and condition.

Long term management

3.7.9 The long-term management of new scrub will focus on the following interventions:

a. All scrub planting plots will undergo an annual condition assessment and an appropriate programme of works developed to address changes in condition and site requirements.

b. Between years 7 and 10, planted areas will be reviewed and thinned out as necessary to remove any poor or weak specimens, which will facilitate other specimens to flourish and provide space for shrubs to further establish.

c. Arisings from thinning or other scrub management functions will be retained on site in the form of dedicated brash and wood piles or wind-rows, for the benefit for fungi, lichen, and invertebrates.

d. Where necessary, arisings from scrub management will be chipped and spread to a depth no greater than 75mm.

3.8 Species Rich Grassland

3.8.1 Species-rich grassland will be established across the Scheme, under the PV panels and in set aside areas. Conservation margins sown with a wild bird seed mix will also be established.

Function

3.8.2 By establishing a diverse sward of grasses and herbs biodiversity will increase, enhancing value for wildlife. The wild bird seed mix in the conservation margins will provide a cover crop habitat for game birds and food source for over-wintering farmland birds such as tree sparrows.

Implementation

3.8.3 The locations for creating species-rich grassland are illustrated on the Outline Landscape Masterplan, Annex A. The exact location and proportion of margin types within the conservation margins will be tailored to the needs of the sites biodiversity. Following best practice, the conservation margins will be 12m in width, and at least 50m in length.

3.8.4 A specification for species-rich grassland will be developed based on the indicative species, percentages presented in **Table** 3-5. This may be subject to change based on the prevailing soil types.

Table 3-6: Indicative mix for species-rich grassland

Botanical Name	Common Name	% Mix
Wildflowers		
Achillea millefolium	Yarrow	1
Agrimonia eupatoria	Agrimony	1.3
Betonica officinalis- (Stachys officinalis)	Betony	1
Centaurea nigra	Common Knapweed	3
Centaurea scabiosa	Greater Knapweed	0.2
Cruciata laevipes	Crosswort	1.1
Daucus carota	Wild Carrot	2
Filipendula ulmaria	Meadowsweet	2
Filipendula vulgaris	Dropwort	0.1
Galium verum	Lady's Bedstraw	1.5
Leucanthemum vulgare	Oxeye Daisy – (Moon Daisy)	2
Malva moschata	Musk Mallow	0.2
Medicago lupulina	Black Medick	2
Plantago lanceolata	Ribwort Plantain	0.2
Poterium sanguisorba – (Sanguisorba minor)	Salad Burnet	0.3
Rhinanthus minor	Yellow Rattle	0.1
Rumex acetosa	Common Sorrel	0.1
Rumex acetosella	Sheep's Sorrel	0.2
Silene silaus	Pepper Saxifrage	0.1
Silene latifolia	White Campion	0.3
Silene vulgaris	Bladder Campion	0.1
Taraxacum offcinale	Dandelion	0.1
		20%
Grasses		
Agrostis capillaris	Common Bent	8
Cynosurus cristatus	Crested Dogstail	28

Festuca rubra	Red Fescue	24
Phleum bertolonii	Smaller Cat's tail	4
Poa pratensis	Smooth-stalked Meadow-grass	16
		80%

Note: mix is Emorsgate Seeds EM3 – Special General Purpose Meadow Mix. Sowing rate: 4g/m2

3.8.1 A specification for conservation margins will be developed based on the indicative species, percentages presented in **Table** 3-5. This may be subject to change based on the needs of the site's biodiversity and prevailing soil types. Other conservation margin options could include planting of legume mixes and creation of tussocky grassland.

Table 3-7: Indicative mix for conservation margins

Botanical Name	*Common Name*	*% Mix*
Wildflowers		
Fumaria officinalis	Common Fumitory	*5*
Lotus corniculatus	Bird's-foot Trefoil	*20*
Medicago lupulina	Black Medick	20
Trifolium pratense	Red Clover	10
Trifolium repens	White Clover	20
Vicia sativa ssp.segetalis	English Vetch	25

Note: Sowing rate: 1.2g/m2

3.8.2 The following steps and working methods will be included in the specification:

a. Where practicable, seed will be obtained from a local source for the purpose of maintaining continuity with local species-rich grasslands.

b. Receiving soils will be prepared to reduce nutrients where possible. This could include spraying with a herbicide to remove existing material and incorporating a substrate to reduce nutrient levels or removing topsoil to expose the sub-soil.

c. Once the nutrient level is reduced, all clods will be broken up and alien material (such as plastics and metals) above 50mm in size will be removed. The top 50mm of the soil will then be raked to prepare a fine tilth for the seedbed. The raking will occur immediately before sowing.

d. Seeding will be completed in either autumn or spring and only once the receiving soils have been tilled and adequately prepared.

e. Seeding and rolling will be carried out in dry weather and access will be prohibited to seeding areas until seed has germinated and a sward has established (see establishment maintenance section below).

Establishment maintenance

3.8.3 A detailed plan for the establishment and management of species-rich grassland and conservation margins will be developed for the five year establishment maintenance period.

3.8.4 The aim of establishment maintenance will be to encourage development of a diverse sward of grasses and herbs. Establishment maintenance will be based on the following principles and outline prescriptions:

a. Immediately after sowing, the ground will be left undisturbed and un-watered to allow the grassland to establish naturally.

b. Mowing will be carried out in June or September in the first year with subsequent cuts in April and September. Arisings will be raked into piles and left in situ for seven days before collection and removal to an off-site green waste composting facility.

c. Visual inspections will be made during the growing season.

d. Control of undesirable species (e.g. arable weeds) and injurious weeds will be undertaken to prevent colonisation and domination of the grassland through the use of additional cuts during the growing season or if essential, a selective herbicide.

e. A 5m wide track around the periphery of the PV panels will be mown to maintain service access to the panels.

f. Botanical surveys will be carried out in late spring to confirm that the establishment species-rich grassland and conservation margins have been successful in achieving their intended aims and objectives. Spot checks will be undertaken at locations within each grassland area by a suitably qualified ecologist during years 1, 3 and 5, the purpose being to record plant species, their distribution, and the overall condition of the grassland. Other relevant indicators relating to the sward that may require remedial action during the contract period or in the future will also be recorded.

g. If remedial action is required, the LCoW will agree action with suitably qualified ecologist and areas identified will be re-seeded

Long-term management

3.8.5 The long-term management of species-rich grassland will be undertaken to maintain a relatively stable grassland community in the long-term, and to avoid areas naturally progressing into tall, dense, grass-dominated areas. In contrast for wild bird seed mix conservation margins, long term management relies on disturbance and re-seeding.

3.8.6 Measures for species-rich grassland and conservation margins will focus on a regime of:

a. Mowing once, annually in September with arisings raked into piles and left in situ for seven days before collection and removal to an off-site green waste composting facility.

b. Visual inspections during the growing season.

c. Control of undesirable species (e.g. arable weeds) and injurious weeds to prevent colonisation and domination of the grassland using a selective herbicide.

d. Meadow margins adjacent to woodland and hedgerows may be left for a year or more between cuts to provide dense ground level cover for fauna, including amphibians, small mammals, and invertebrates.

e. For conservation margins, if ground nesting birds are absent, plots may be scarified or 50% cut between mid-June and mid-July. Arisings raked into piles and left in situ for seven days before collection and removal to an off-site green waste composting facility.

f. For conservation margins, plots re-sown every 2 to 3 years.

g. The results of annual monitoring surveys will be used to adjust the management regime to maximise biodiversity.

3.9 Natural Regeneration Buffer to Woodland and Pond Edges

3.9.1 An area 15 to 25m wide adjacent to existing ponds and woodland both within and outside the Order limits will be encouraged to naturally regenerate. There will be no routine management of these areas.

Function

3.9.2 Natural regeneration will further increase biodiversity and provide an opportunity to observe the gradual structural transition from grassland to canopy woodland habitats.

Implementation

3.9.3 During construction the areas identified for natural regeneration will be protected to ensure the soils do not become compacted and the natural process required to develop the area can operate.

Long-term management

3.9.4 Other than the creation of dead-wood piles, these areas are not expected to be subject to routine management. An annual inspection and survey will be carried out to record growth and development of the area. If required, litter, rubbish and debris will also be removed and mowing, and cutting will be used to manage scrub at the edge of the buffer.

3.10 Pond restoration and planting around ponds

3.10.1 Existing ponds in poor condition will be restored with the aim of maximising their wildlife value. This will partly be achieved by de-silting to ensure that they remain at least partly wet during normal conditions, allowing amphibians and invertebrates to complete their life cycles. Where existing ponds are over-shaded by mature trees, including poplars, willows and oak pollards, these trees will be prioritised for re-pollarding, to increase light and decrease leaf fall

onto the ponds. Scrub clearance and de-silting around ponds will be phased over five years, to prevent the site-wide loss of existing shaded pond habitats and to provide ponds in various stages of natural succession to provide a wider range of niches for wildlife. Water features tend to be colonised naturally, therefore no planting is considered necessary or desirable in these areas.

Function

3.10.2 Ponds and water features will be managed within the Order limits to enhance the biodiversity value for aquatic species as well as birds and other animals that use the water features. Amphibians will thrive in the water features and enhanced surrounding habitat and invertebrates will benefit from the improved water quality.

Implementation

3.10.3 The location of existing ponds and water courses is illustrated on the Outline Landscape Masterplan, Annex A.

3.10.4 No planting of aquatic species is proposed and ponds will be allowed to colonise naturally. Some adjacent bankside/grassland planting may be undertaken where required following scrub clearance and de-silting. A specification for this planting will be developed based on the indicative species, percentages presented in **Table** 3-7.

Table 3-7: Indicative mix for bankside grassland

Botanical Name	*Common Name*	*% Mix*
Wildflowers		
Achillea millefolium	Yarrow	1
Agrimonia eupatoria	Agrimony	0.2
Angelica sylvestris	Wild Angelica	0.2
Centaurea nigra	Common Knapweed	2
Chaerophyllum temulum	Rough Chervil	0.3
Cruciata laevipes	Crosswort	3
Dipsacus fullonum	Wild Teasel	2
Filipendula ulmaria	Meadowsweet	5
Galium album - (Galium mollugo)	Hedge Bedstraw	2.6
Galium verum	Lady's Bedstraw	1
Leucanthemum vulgare	Oxeye Daisy	2
Lythrum salicaria	Purple Loosestrife	0.2
Malva moschata	Musk Mallow	0.2

Plantago lanceolata	Ribwort Plantain	0.1
Rumex acetosa	Common Sorrel	0.1
Silaum silaus	Pepper Saxifrage	0.1
		20%
Grasses		
Agrostis capillaris	Common Bent	10
Anthoxanthum odoratum	Sweet Vernal-grass (w)	3
Briza media	Quaking Grass (w)	6
Cynosurus cristatus	Crested Dogstail	26
Deschampsia cespitosa	Tufted Hair-grass (w)	2
Festuca rubra	Red Fescue	28
Schedonorus pratensis (Festuca pratensis)	Meadow Fescue	5
		80

Note: Mix is Emorsgate Seeds EP1 – Pond Edge Mixture or equivalent

Sowing rate: 4g/m2

Establishment Maintenance

3.10.5 The growth of naturally colonising aquatic plants and any adjacent grassland planting will need to be controlled and managed to maintain the habitat diversity. A detailed plan for the establishment and management of any planting will be developed for the five year establishment maintenance period. This will be determined through monitoring of the ponds through annual site inspections to identify requirement for any remedial action.

Long-term management

3.10.6 The long-term management of naturally colonising aquatic plants and any adjacent grassland planting will be undertaken to manage the ponds at various stages of succession to maintain a relatively stable and diverse wetland community in the long-term, and to avoid areas becoming dominated by one to two species.

3.10.7 The management prescriptions outlined below should be adapted as required following findings of annual site inspections and condition monitoring reports.

a. Remove all litter, rubbish and foreign debris and remove from site.

b. Carry out rotational management of the marginal plants with the selective removal of the most dominant marginal planting to ensure the intended species diversity is retained. Works to be carried out in October.

c. Prohibit excessive and extensive spread of plants once planting is established. Remove spreading plants as required in October.

d. Monitor silt depth and if required remove silt material if it is considered to be detrimental to the function of the pond. All material should be left at the edge of the channel over night before being removed off site or to an agreed area offsite so any aquatic fauna can migrate back to the feature. This should be carried out annually in November to December.

e. Bank erosion should be monitored and any erosion should be reported, and mitigation should be provided.

3.11 Provision of habitat boxes

3.11.1 A range of artificial bird and bat boxes will be installed in existing woodland areas, on retained individual trees and existing trees in hedgerows to increase the availability of nesting and roosting features and enhance the value of the woodlands for these species' groups.

3.11.2 A total of 40 bird nest boxes and 30 bat roost boxes of varying types to suit different species of birds and bats will be installed within the retained woodland areas on suitable trees, on individual trees and on hedgerow trees, in locations to be determined by an ecologist at the time of installation. This will include tree sparrow boxes in suitable trees west of Leylands Farm close to where the tree sparrow population was recorded.

3.11.3 Bird and bat boxes made from long lasting materials (such as Woodcrete) will be used and would be expected to have a life expectancy of 20-25 years.

3.11.4 A minimum of five tree mounted or tower mounted barn owl boxes will be provided in the Order limits located >1km from the A12 and Boreham Road.

Long-term management

Bird/barn owl boxes

3.11.5 All wild birds, their active nests and eggs are protected under the Wildlife and Countryside Act (1981), as amended. This makes it an offence to deliberately, or recklessly kill or injure any wild bird or damage or destroy any active nest or eggs of a wild bird.

3.11.6 Annual cleaning of bird boxes cannot be undertaken between the months of March and August inclusive, when birds may be using the boxes. Therefore, bird boxes will be cleaned between October and February to prevent the build-up of nest parasites in the boxes whilst avoiding the risk of disturbing birds using the boxes as a roost site during the cold winter months.

3.11.7 Barn owl boxes will be inspected annually between November and December by a suitably licensed ecologist. Where barn owls are absent any nesting material of other species (such as accumulations of sticks) will be removed where required, after ensuring the nest is empty.

Bat boxes

3.11.8 Bat boxes will be inspected by an appropriately licensed bat surveyor for evidence of uptake as per the post-construction monitoring programme (see

timing in Section 4), and any evidence of roosting bats will be recorded to assist with ongoing management of the woodland on site.

3.11.9 Where monitoring is not undertaken above, the condition of all wildlife boxes installed will be monitored annually during the operation of the scheme and replacements will be made as necessary. Inspections can be timed to coincide with the required inspections of new tree and shrub plantings.

3.11.10 Bat boxes are, in most circumstances, unlikely to be used by hibernating bats during winter months (between November and February inclusive). Therefore, any maintenance that is required on bat boxes should be undertaken during these months, when any bird nests will be removed, after ensuring they are not in use. All bats and their roosts are protected under the Wildlife and Countryside Act (1981), as amended. Therefore, it is an offence to possess, control, transport, sell or exchange any live or dead bat. Therefore, if bats are inadvertently discovered during maintenance, the person undertaking the maintenance should leave the box undisturbed.

Creation of habitat piles

3.11.11 Habitat piles and hibernacula would be constructed throughout the Scheme in suitable areas, such as close to ponds or the River Ter, using natural materials generated during clearance of the site, such as logs, turf, and grass strimmings. These would provide refuge and hibernation opportunities for amphibians and reptiles, as well as dead wood habitat for invertebrates, which would in turn benefit fauna such as bats and birds.

4. Pre - and Post Construction Monitoring

4.1.1 Monitoring is required in order to determine that the functions documented within this OLEMP are being achieved and whether any remedial management action may be required. The baseline against which the effects of the actions resulting from the monitoring can be compared against, comprise the pre-construction baseline data. This baseline data collected in 2020 will require updating prior to construction, as by operation (from 2026) these data will be over 3 years old and out-of-date (Ref 6). Updates would include a similar set of surveys undertaken at the baseline where relevant ecological receptors have been identified, including surveys of breeding and non-breeding birds, bat activity and badgers.

4.1.2 A post-construction monitoring programme will be formalised and agreed as part of the application and included within the detailed LEMP. Walkover surveys of the Order limits will be undertaken between April and June in years 2, 4, 6 ,10 and then every 5 years post-construction until year 40. The surveys will involve an inspection of the woodland, hedgerows, grassland, and wetland habitats to ensure that they are being managed accordingly.

4.1.3 Post-construction monitoring for flora, birds (breeding and non-breeding), riparian mammals, badgers, bats (bat box roosting and activity survey), great crested newt and reptiles (presence/absence) will be undertaken in the

respective seasons, in years 1, 3, 5 and 10 post-construction. This is likely to involve similar or scaled-down methods to the baseline surveys to enable cross-comparison with baseline data, to assess any changes in biodiversity as a result of the Scheme. This may include use of bat static detectors, breeding bird survey, targeted reptile surveys in enhanced habitats and great crested newt presence/absence survey of restored ponds.

4.1.4 An annual maintenance check of wildlife boxes (bats, birds and barn owl) would be made each winter to ensure that all boxes are still in position and secure. Some refitting of boxes, repairs and replacements are likely to be required over the life of the Scheme.

4.1.5 Results from the post-construction monitoring will feed into the management plan and if required management may be amended accordingly based on this monitoring.

4.1.6 Amendments to the management measures proposed would fall into different categories:

a. timing and frequency of implementing measures, e.g. responses to changes in the climate over the expected duration of the Scheme of approximately 40 years;

b. increase or decrease in the areas of habitats being managed, e.g. to achieve a better balance between certain types of habitat;

c. changes in the techniques used to implement the measures, e.g. in response to new methods and equipment available for habitat management; and

d. - responses to unexpected events, e.g. storm damage or flooding.

4.1.7 The detail of such amendments would be advised on by Braintree District and Chelmsford City Councils' ecologist based on data provided by the monitoring including that required through biodiversity net gain requirements. The Applicant would then determine any amendment or amendments to the management measures.

4.1.8 Biodiversity net gain, monitored over 30 years for most habitats, is likely but be undertaken at Years 2, 5, 10, 15, 20, 25 and 30, with BNG condition assessments conducted in those years and reported back to Braintree District and Chelmsford City Councils. Each monitoring interval would also allow for management prescriptions to be modified. Some habitats which have a 'Very High' distinctiveness score or a long time to target condition require a bespoke management agreement to a longer time period, for example Wood Pasture and Parkland and Priority Broad Leaved Woodland.

5. References

Ref 1 Natural England (2014) NCA Profile: 86 South Suffolk and North Essex Clayland (NE515).

Ref 2 Natural England (2013) NCA Profile 111 Northern Thames Basin (NE466).

Ref 3 Landscape Institute (2020). Infrastructure Technical Guidance Note 04/20

Ref 4 Essex Planning Officers Association (2018) The Essex Design Guide

Ref 5 Chris Blandford Associates (2006) Braintree, Brentwood, Chelmsford, Maldon And Uttlesford Landscape Character Assessment (2006)

Ref 6 CIEEM (2019) Advice note: On the lifespan of ecological reports and surveys. April 2019.

6. Annexes

6.1 Annex A: Outline Landscape Masterplan