Belvoir Solar Farm

on behalf of JBM Solar Projects 10 Ltd

Biodiversity Management Plan

avian ecology

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CONTENTS

1 INTRODUCTION

1.1.1 This Biodiversity Management Plan (BMP) sets out habitat protection and enhancement measures for a proposed solar farm and associated infrastructure on land to the north of Belvoir, Leicestershire, henceforth referred to as 'the Site'. This document also details ecological management practices to be adopted with the aim of developing and maintaining wildlife habitats to provide a net gain for local biodiversity. It is considered the implementation of this BMP will allow the Site to achieve the objectives stated within the biodiversity net gain assessment.

1.1.2 Habitats within the Site comprise of arable land and small pockets of broad-leaved woodland with field boundary features including hedges, ditches and scattered trees. A number of ponds are present within the Site, the majority of which were dry.

1.1.3 These habitat are also reflected in the wider area, with additional habitats including improved grassland, pastoral farmland, small pockets of mixed semi-natural woodland and farm buildings.,

1.1.4 The site-specific approach provided within this report provides recommendations for long-term management of the land (over a period of at least 30 years) to conserve and improve landscape habitat connectivity with the wider landscape for wildlife through protecting and enhancing potentially important wildlife corridors and habitats. This will contribute to the establishment of coherent ecological networks, supporting the biodiversity net-gain targets of the National Planning Policy Framework (2021).

1.2 Implementation of the BMP

1.2.1 The implementation of the BMP will be the responsibility of the Developer of the Site, working in conjunction with the landowners ("Owners") and/or appointed management organisation.

1.2.2 All works associated with the implementation of the BMP will be undertaken by experienced contractors and / or under the watch of a suitably qualified (and where required, licenced) ecologist.

1.2.3 The Developer shall be responsible for the cost of implementing the BMP including the cost of carrying out any management, monitoring, or other such activities.

2 ECOLOGICAL BASELINE

2.1.1 This Biodiversity Management Plan should be read in conjunction with the Drawing No. P19-2022_10Q Landscape Strategy. Detailed descriptions of habitats and species can be found in the Belvoir Solar Farm Environmental Statement (ES), Chapter 5: Biodiversity, and associated appendices as well as the Further Information Report.

2.1.2 The Site is not located within any statutory or non-statutory designated site, however Muston Meadows Site of Special Scientific Interest (SSSI) and the overlapping Muston Meadows National Nature Reserve (NNR) is located immediately adjacent to the Site. Four more SSSI are located within 5km of the Site. In addition, two local wildlife sites (LWS) are located within 2km of the Site, the nearest being Grantham Canal and Banks LWS located 600m east of the Site.

2.1.3 Pre-development the Site consists predominantly of arable fields. Hedgerows are present as field boundaries throughout. There are three ponds located within the Site, these were dry during the surveys and considered to be dry for much of the year. The arable land forming the majority of the Site is considered to be of low ecological value. The boundary hedgerows and blocks of trees are of higher value and are likely to provide shelter, foraging and commuting habitat for a range of species typical of the local area.

3 ECOLOGICAL MITIGATION MEASURES

3.1 Designated Sites and Habitats

3.1.1 Adjacent habitats, including those within Muston Meadows SSSI and NNR, will be protected by perimeter security fencing which will be erected first to maintain a minimum 11m buffer and prevent the encroachment of construction works beyond the Site boundary. Gaps or mammal gates will be installed at suitable intervals and locations along the perimeter fence line to allow small mammals and other species free movement between the Site and the adjacent SSSI and NNR.

3.1.1 Areas adjacent to the SSSI/NNR will be managed to encourage the regeneration of the area to neutral grassland including green winged orchids *Orchis morio* which are listed within the citation of the SSSI. As an alternative, if possible, these areas will include green hay or seeds provided from nearby donor sites within the SSSI, to encourage the development of habitats with local provenance. The provision of green hay or seeds depends upon their availability and will be subject to further consultation with landowners/managers and Natural England (NE).

3.1.2 If local provenance seed mixes are used, yellow rattle *Rhinanthus minor* will be included in the seed mixes as this species is known to parasitise grass species, thereby impairing the vigour of the grass growth and providing more opportunities for wildflower species to establish on land previously used for agriculture.

3.1.3 Standard measures to ensure runoff control and pollution prevention will be implemented; these measures will safeguard retained habitats within and surrounding the Site.

3.1.4 Hedgerows will be retained on Site and along with mature trees and woodland around the construction area, will be protected in-line with BS 5837:2012 *Trees in relation to design, demolition and construction*.

3.1.5 The Site will not be routinely lit during either construction or operation; any lighting employed will be designed to maintain dark corridors around the Site and avoid illumination of the designated sites.

3.1.6 There will be clear delineation of working areas and access routes for vehicles entering the Site and instructions on these will be given to all site construction staff, delivery drivers and subcontractors.

3.2 Birds

3.2.1 Vegetation removal and ground clearance will be undertaken outside of the bird breeding season (March-August inclusive) if possible. If vegetation works are necessary during the breeding season any suitable nesting habitat to be affected by works should 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 nests/young will be impacted and there is no risk of an offence under the relevant legislation.

3.3 Badger

3.3.1 A pre-construction badger survey will be undertaken prior to works commencing to check for active or any newly constructed setts (between the initial baseline survey and the construction start date) within at least 30m of construction areas. The ecologist will advise the Site Manager on any requirements to ensure legislative requirements, such as maintaining buffer/exclusion zones.

3.3.2 If baseline conditions have altered and disturbance to badgers or their setts is considered likely during the proposed works, one or both of the following options will be incorporated:

- Construction working methods will be amended to avoid disturbance, or development design will be amended to avoid works which may impact upon badgers and their setts (e.g. alteration of the configuration of panels and/or fencing); and/or,

- A development licence will be obtained from Natural England before construction commences.

3.3.3 Any deep excavations or trenches created during construction will be backfilled or covered overnight to prevent animal entrapment.

3.4 Bats

3.4.1 Protection of all mature trees, hedgerows and woodland on and adjacent to the Site or along access routes will safeguard potential roost sites and maintain foraging and commuting opportunities. Construction works will stand off from hedgerows and trees in accordance with the Site Layout Plan and in line with BS 5837:2012 *Trees in relation to design, demolition and construction*, thereby protecting habitats likely to be used by bats.

3.4.2 If any trees are required to be impacted suitable checks for roosting bats by a licensed ecologist will be undertaken in advance of any removal. If bats are confirmed to be roosting within any tree to be impacted by proposed works, the data gathered would be used to inform potential design amendments avoid impacts or, failing that support a licence application with suitable mitigation measures to Natural England to destroy/disturb the bat roost.

3.4.3 In order to protect foraging / commuting bats, lighting required during construction and/or operation of the solar array facility will be used in a sensitive manner and directed away from field boundary habitats and habitats bordering the Site. This will be achieved in a number of ways, including the use of low-level lighting and use of hoods and careful selection of lighting (further information is provided in BCT guidance (2009) *Bats and Lighting in the UK: Bats and the Built Environment Series*[1]).

3.5 Amphibians and Reptiles

3.5.1 As a precautionary measure, Reasonable Avoidance Measures (RAMs) will be implemented during the construction phase to safeguard animals during works if minor removal of suitable habitat is required, namely removal of immature hedgerow section or clearance of grassland around arable field margins.

4 ECOLOGICAL ENHANCEMENT MEASURES

4.1 Habitat Creation

4.1.1 Management practices are proposed that will enhance the Site for the benefit of local wildlife. The design and long-term management of the land seeks to maintain and improve functionality through protecting and enhancing potentially important wildlife corridors i.e. through creation, enhancement and maintenance of native species hedgerows within and around the Site. The Landscape Strategy sets out the landscape planting and maintenance specifications.

4.1.2 All planting stock supplied shall be healthy and viable and comply with BS 3936: Parts 1 to 10 as relevant, and BS 4043, the National Plant Specification, published by the Horticultural Trades Association (HTA) as appropriate. Supplying nurseries will be registered under the HTA Nursery

[1] Bat Conservation Trust. (2009). *Bats and Lighting in the UK: Bats and the Built Environment Series.* available at: http://www.bats.org.uk/data/files/bats_and_lighting_in_the_uk__final_version_version_3_may_09.pdf

Certification Scheme. All plants will be packed and transported in accordance with the Code and Practice for Plant Handling as produced by Committee for Plant Supply and Establishment (CPSE).

4.1.3 All seeding shall be carried out in accordance with BS 4428:1989 Code of Practice for general landscape operations (excluding hard surfaces), or the most up to date and current British Standard and in accordance with seed supplier's technical advice.

4.1.4 It is advised that herbicides are not used on Site and where possible, arable weeds are retained. However, if the use of herbicides cannot be avoided, such as for the removal of injurious weeds within grazed areas (please refer to paragraph 5.1.4), the herbicide handbook (English Nature, 2003[2]) provides guidance on appropriate herbicide use in relation to nature conservation works.

4.1.5 Planting will not be carried out when the ground is waterlogged, frost bound or during periods of cold drying winds.

4.1.6 All bare-root planting stock will be kept covered until actually planted in order to minimise water-loss and prevent the roots from drying out. Bare root stock shall be planted while dormant (November-April) or alternatively cell or container grown stock shall be used.

Grass Seeding

4.1.7 Following construction of the solar panels and associated infrastructure, all areas of bare earth within the site, including those areas in between temporary protective fencing and existing landscape features, will be sown with grass and meadow seed as specified in the Landscape Strategy.

4.1.8 Between the security fencing and existing/proposed hedgerows a species rich grass and wildflower mix would be sown, such as the Emorsgate EM2 Standard General Purpose Meadow Mixture or similar.

4.1.9 In areas surrounding the solar panels and within the security fence line a seed mix suitable for low intensity sheep grazing, such as the Emorsgate EG26 Special Old Fashioned Grazing Mix or similar, will be sown.

4.1.1 Land adjacent to Muston Meadows SSSI/NNR will either be left for natural regeneration or laid with green hay or seeds provided from nearby donor sites within the SSSI to encourage the development of habitats with local provenance, primarily neutral grassland with green winger orchids.

4.1.2 Mixes shall be sown in accordance with suppliers' instructions and the Landscape Strategy and also in line the elements below.

<u>Ground Preparation</u>

4.1.3 Following the installation of the array, reinstatement works should include the removal of all stones and other debris to ensure the ground is suitable for use with mowers.

4.1.4 Subsequent to the last crop being removed, no fertilizer will be added to the arable land on the site.

4.1.5 Construction activities requiring heavy machinery will only take place during periods of dry weather, in order to avoid churning and damaging the soil.

4.1.6 Prior to seeding, the ground will be harrowed and rolled, using a tine harrow in order to avoid damaging underground wiring. However, if there are any areas which have suffered high soil compaction, for instance due to heavy machinery being deployed, these will be harrowed using a disc harrow to ensure the soil structure is suitable for subsequent sowing. If such a requirement arises to

[2] English Nature (2003) *Herbicide handbook. Guidance on the use of herbicides on nature conservation sites*

harrow with discs, caution should be exercised to ensure newly installed underground services are not damaged during harrowing.

4.1.7 Where possible, arable weeds should be retained, and the use of herbicide restricted during ground preparation.

Seeding

4.1.8 All seeding will take place ideally in mid-spring or late summer to mid-autumn. Seed will be sown in the first year following completion of underground wiring, and be broadcast by machine (fertiliser spreader, slug pellet applicator, grass seed box) and rolled where possible. The gaps between strings of panels are to be wide enough to accommodate a tractor travelling between them for harrowing, sowing and rolling purposes. In areas where a machine is unable to access, such as far underneath panels, seeding in these areas should be broadcast by hand. Seeds can be mixed with a substrate such as sand or sawdust for ease of broadcasting.

4.1.9 Sowing rate is recommended by the manufacturer as 4g per square metre or 40kg/hectare for both mixes.

Hedgerow Planting

4.1.10 Approximately 1.18km of new mixed native species hedgerow planting will be undertaken including the gapping up of existing hedgerows. Native hedgerow species have been chosen to be typical of the local area, incorporating species observed during the baseline ecology surveys where appropriate. Species included within the hedgerow will match those already present within the Site and are listed in the Landscape Strategy.

Ground Preparation

4.1.11 Where necessary, existing weeds will ideally be manually removed by hand weeding and where this is not possible a suitable herbicide as specified within the herbicide handbook (English Nature, 2003) will be used as a last resort.

4.1.12 All extraneous matter such as plastic, wood, metal and stones greater than 50mm diameter will be removed from site to a registered waste disposal facility.

Planting

4.1.13 Hedgerows will be planted in a double staggered row at 5 plants per linear metre, unless specified otherwise in the landscaping proposals.

4.1.14 The exact timing of the proposed hedgerow planting will be dependent on the ground conditions, but bare-root planting should ideally take place between the months of December-February inclusive. It is expected that ground conditions and climate will allow for earlier planting (i.e. before January), and this will allow the plants more time to establish a network of feeder roots before the onset of spring. Planting should avoid freezing and water-logged conditions.

4.1.15 Planting slots shall be made using a planting spade and shall be dug 450mm wide x 450mm depth. Plant notches should be T, L- shaped or straight, using spades of a design suitable for this purpose. The planting notches must be vertical and deep enough for the roots to hang freely, with the transplant being planted so that the root collar is exactly level with the ground surface. The notch must then be closed, and the soil will be well firmed round the roots in line with the guidelines as set out in BS 4428 (1989).

4.1.16 All plants will be watered in at the end of each day of planting/or as required. After planting a 50mm layer of approved and biosecure compost fine bark (nominal size 1-10mm) shall be spread along the hedge trench to 1m wide or spread around the pit of each woodland plant at 1m wide.

4.1.17 All hedgerow planting stock will be protected from rabbit damage using rabbit proof fencing or individual spirals/shrub guards supported with canes or stakes as advised by the manufacturer. Any spiral/shrub guards used that are not biodegradable, will be removed approximately three years after planting or once established.

Woodland Planting

4.1.18 Woodland screen planting is proposed along north western boundary of the Site as shown on the Landscape Strategy. This planting will be approximately 10m wide and with a total area of 0.2ha.

Ground Preparation

4.1.19 If the formation level is compacted it will be ripped through before topsoiling.

4.1.20 Where necessary, existing weeds will ideally be manually removed by hand weeding and where this is not possible a suitable herbicide as specified within the herbicide handbook (English Nature, 2003) will be used as a last resort.

4.1.21 Trees/shrubs are to be placed into pits that will accommodate the roots comfortably, with approximately 75mm space outside the extent of the roots.

4.1.22 The bottom and sides shall be forked to break up the subsoil. All extraneous matter such as plastic, wood, metal and stones greater than half brick size will be removed from site.

4.1.23 Topsoil is to be stored in accordance with British Standards or other guidance current at the time of planting. Imported topsoil (if used) to conform to requirements of British Standards or other guidance current at the time of planting.

Planting

4.1.24 The exact timing of the proposed planting will be dependent on the ground conditions, but planting should ideally take place between the months of December and February inclusive, this will allow the plants more time to establish a network of feeder roots before the onset of spring. Planting should avoid freezing and waterlogged conditions.

4.1.25 Trees/shrubs are to be placed into the pits and backfilled with local topsoil previously stripped from the Site. A general-purpose slow release fertiliser (at the rate of 75gm/m2) and Tree Planting and Mulching Compost (at the rate of 20litres/m2) are to be incorporated into the top 150mm of topsoil during backfilling. Where tree pits are more than 300mm deep, backfilled material shall be consolidated / firmed in 150mm layers. Additional topsoil will be imported onto the site if topsoil stripping operations do not provide sufficient topsoil for the entire tree planting.

4.1.26 Trees shall be well firmed-in and secured with stakes, proprietary rubber tree ties and spacers as below.

4.1.27 All select standard trees will be held so that movement at the root collar is minimised until new roots have developed to anchor the tree. Therefore, low staking (75mm diameter x 1.5m length) will be used and attached to the tree at approximately 1200mm above ground level. Stakes will be driven 300mm into undisturbed ground of the bottom of the tree pit before planting the tree, taking care to avoid underground services and cables. The trees will be staked using proprietary rubber ties and must be firmly fixed with a spacing device used to prevent chafing against the tree.

4.1.28 All trees will be protected from grazing damage by the fitting of approved tree guards. If the bushiness of the tree prevents the use of standard tree guards, then an alternative design of guard shall be used in agreement with the project landscape architect. Composted bark mulch will be spread to a depth of 75mm in a 1m diameter circle around all individual trees, ensuring that desirable groundcover plants (where present) are not buried.

4.1.29 All trees/shrubs shall be watered in at the end of each day of planting.

4.2 Wildlife enhancements

Birds

4.2.1 Additional bird nesting provision will be made through the inclusion of a minimum of seven bird boxes, including two owl boxes erected on mature and semi-mature trees located around the Site.

4.2.2 Bird boxes should ideally be installed in the autumn (September to November) following the cessation of construction works, by the appointed contractor under advice of the suitably competent ecologist. Boxes should be erected at an appropriate height of between 1 to 5 metres. Boxes should be angled so that they face away from the prevailing wind or in a semi sheltered environment. Positioning within or close to hedgerows will increase chances of occupation. Bird boxes will be suitable for a variety of farmland bird species.

4.2.3 Two owl boxes should be erected in line with the Barn Owl Trusts guidelines[3] and be sited over 1km from major roads. They should also be angled away from the prevailing wind, ideally to the south east to also avoid direct heat at the hottest time of the day.

Bats

4.2.4 Additional bat roost provision will be made through the inclusion of a minimum of ten bat roost boxes on mature and semi-mature trees along the Sites northern, western and eastern boundaries. Boxes will be erected in suitable habitats (i.e., along boundary features), at an appropriate height (ideally above 4m in height) and with clear flight paths to utilise the Site boundary features. Boxes should be exposed to sun for at least part of the day and so erected on a south facing aspect. It is often appropriate to erect multiple boxes on the same tree at slightly different heights and aspects to create a variety of microclimates. Minor pruning may be required to ensure a clear drop zone below newly installed bat boxes. Bat boxes will be installed in line with the suppliers' instructions and as advised by an ecologist.

Amphibians and Reptiles

4.2.5 A total of six log piles and six purpose built hibernacula will be constructed at the peripheries of the Application Site. This will provide enhanced shelter and overwintering refuge for amphibians and reptiles if present.

Invertebrates

4.2.6 Two 'insect hotels' will be constructed and placed in species rich grassland around the peripheries of the site to provide additional enhancements for invertebrates utilising the Application Site. These, along with beehives proposed to be located on Site will benefit pollinators and invertebrate diversity.

[3] https://www.barnowltrust.org.uk/barn-owl-nestbox/owl-boxes-for-trees/

5 HABITAT MANAGEMENT

5.1 Grassland

5.1.1 The grassland around the Site will be managed to provide a varied habitat structure providing nesting opportunities for birds and nectar, pollen and shelter for invertebrates, amphibians, reptiles and small mammals. Taller wildflower and tussock grassland vegetation will be encouraged to develop along the base of hedgerows at the boundaries to provide additional dispersal, foraging and shelter opportunities for wildlife.

5.1.2 Occasional small bare patches at the margins of the Site, either naturally arising or created in the course of management will be tolerated and allowed to remain. These increase micro-topographic diversity and variety of ground conditions which can be essential for the life-cycle of many invertebrate species and also may potentially be utilised by some bird species for nesting and feeding purposes. These small areas also provide periodic disturbed ground conditions necessary to develop and maintain diverse grasses and wildflower communities.

Initial Management

5.1.3 Grassland management will be carried out in accordance with the seed supplier's technical advice during the establishment phase. Most of the sown meadow species are perennial and will be slow to germinate and grow and will not usually flower in the first growing season. There will often be a vigorous initial growth and a flush of annual weeds during the first season. This should be managed across all of the seeded areas by regular topping and mowing throughout the first year at regular intervals. Regular cutting to establish the grassland will take place during Year 1 after seeding and possibly also in Year 2 if growth is particularly vigorous on the ex-arable land. Initially, in the first year following sowing, checks will be made to assess and control annual weeds. Problem perennial weeds will be controlled by hand pulling or if necessary careful targeted application of a non-residual herbicide by way of spot spraying with a knapsack (low pressure to avoid spray drift), or weed wiping (no herbicide application within the vicinity of ditches and watercourses) herbicide application may be used in April, June and August. Alternatively, annual weeds can be managed by topping and mowing prior to setting seed which will encourage lateral development of the grasses. Any topping undertaken between April and July should be no lower than 200mm to prevent harm to any ground nesting birds.

5.1.4 Specific attention should be paid to the potential presence of the following five injurious (harmful) weeds: common ragwort (*Senecio jacobaea*), spear thistle (*Cirsium vulgare*), creeping thistle (*Cirsium arvense*) curled dock (*Rumex crispus*) and broad-leaved dock (*Rumex obtusifolius*); which are all listed within the Weeds Act 1959. These species should be removed from the grassland areas which will be sheep grazed prior to enhancement works commencing[4] [5].

5.1.5 In the unlikely event that the grassland / meadow planting fails, and the area of bare ground is greater than 10%, these areas will be re-seeded, whilst still accommodating small areas of bare ground.

5.1.6 If the mixture is autumn sown or contains yellow rattle a high spring cut to between 70-100mm will be undertaken around April with no further mowing until mid-July.

[4] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/525269/pb9840-cop-ragwort-rev.pdf

[5] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69296/pb7190-harmful-weed-control.pdf

Subsequent years

5.1.7 Following seeding and establishment of a robust sward, grassland will be managed by rotational low-intensity grazing in accordance with the landowners' requirements, either rotating sheep within the site through control with stock proof fencing or through rotational grazing using nearby fields and removing sheep from parts of the site to encourage plants to flower and set seed.

5.1.8 Ideally, it is best to aim for a stocking rate just sufficient to maintain a varied structure, rather than the maximum that the grassland can support. Grazing density guidance herbicide u(per the table below) is based on medium sized sheep (e.g. 60kg). It is important to constantly monitor the Site to ensure the grassland is not under or over grazed and stock density and duration altered accordingly. The stocking density should be reduced in wet periods or in conditions when poaching would lead to a break-up of the sward and colonisation by aggressive weed species.

Table 5.1: An indicative guide to stocking levels for lowland grassland (number of sheep per hectare). Adapted from the Lowland Grassland Management Handbook produced by Natural England.

Number of grazing weeks per year	Neutral Grassland (sheep per ha)
16	12.5
20	10
24	8
36	5.5
52	4

5.1.9 The following indicators will be used to review and amend stocking densities:

- An increase in the amount of uneaten grass, the accumulation of litter, an increase in vigorous rank and unpalatable grasses, and a reduction in low growing herbs: indicates stocking density is too low (need to increase density).

- A reduction in density/diversity of plants, excessive poaching, weed invasion and the development of bare patches: indicates stocking density is too high (need to reduce density).

5.1.10 Herbicides will be avoided wherever possible, but if necessary to control pernicious weeds, applications to control weeds should be undertaken immediately after sheep have been removed from a grazing area.

5.1.11 The areas will be subject to intermittent grazing by sheep between approximately September and January, where conditions allow. Moderate trampling will expose ground for colonisation by annuals the next spring; however, heavy trampling can lead to ground poaching and infestations by weed species that will be detrimental to the Site. During the spring and summer (March to August), sheep will be removed or stocking density reduced to allow summer flowering plants to set seed. Grazing will be carefully monitored in the winter period in order to prevent excessive compaction of wet earth.

5.1.12 Cutting of any un-grazed areas will be in accordance with measures outlined for species rich grassland below.

Species Rich Grassland

5.1.13 The meadow and grassland adjacent to the SSSI shall be mown under differing regimes for Year 1 after seeding and subsequent years, as detailed below.

5.1.14 Mowing will only take place during periods of dry weather to ensure that no waterlogged ground is damaged by machinery.

5.1.15 The grassland will not be improved by chemical fertilizer or slurry, and nutrient levels in the soil should be encouraged to reduce over time.

5.1.16 Where possible, cut material should remain on Site for three to five days following the cut to allow seeds to disperse, and then either removed from site or a proportion placed on habitat piles within field margins.

Year 1/Establishment period

5.1.17 Newly seeded grassland/natural regeneration or local provenance hay/seed mix areas will be subject to regular cutting to a height of between 40mm and 60mm, with arisings removed during the first year of establishment in order to prevent annual weeds from establishing.

5.1.18 This shall constitute a cut 6-8 weeks after sowing and then every month thereafter between May and September. The frequency of cutting will be increased should annual weeds establish.

5.1.19 If the mixture is autumn sown or contains yellow rattle a high spring cut to no lower than 100mm will be undertaken around April with no further mowing until mid-July.

Subsequent years

5.1.20 The management of the established meadow grassland will take a flexible approach and the exact dates will be dependent upon weather conditions. A phased (rotational) cutting regime is recommended (i.e. ideally the entire area should not be cut at the same time) in order to allow for more varied structured grassland.

5.1.21 There may be circumstances when an additional selective summer cut is required to prevent vegetation obscuring panels, in such cases cuts should reduce sward height to no lower 200mm to avoid impacts on nesting birds and should be confined to areas close to panels where growth is causing shading. Other areas should be left uncut.

5.1.22 Cuttings should remain on-site for three to five days following the cut to allow seeds to disperse, and then be removed in order to remove nutrients and promote the development of a species-rich sward and a small proportion placed on habitat piles located within field margins.

5.1.23 Meadow grassland and grassland adjacent to the SSSI will be cut only occasionally once established, with a high cut every year or couple of years to prevent scrub encroachment or excessive grass growth. No cutting will take place through the summer to allow the seeds of the later flowering species to fall prior to the cut. Cutting can be undertaken on a flexible basis with the aim to allow a tussocky species diverse edge habitat to establish with little active management required. Cutting should adopt a systematic method (i.e. working outwards towards the boundary features); this will allow fauna to temporarily and safely vacate the area.

5.1.24 The management will take a flexible approach and the exact dates will be dependent upon weather conditions. A phased (rotational) cutting regime is recommended (i.e., ideally the entire area should not be cut at the same time) in order to allow a more varied structured grassland.

5.2 Hedgerows

Existing Hedgerows

5.2.1 Existing hedgerows shall be left to grow with minimal selective thinning and maintained to a height as specified in the Landscape Strategy.

5.2.2 During establishment, dead, dying and diseased wood is to be replaced with stock of a similar size and species by the appointed contractor at their own cost. If the failure of the plant is due to disease and the disease is considered likely to re-occur, then an alternative native species of local provenance may be used as a replacement. Planting should ideally be undertaken between the months of December and February. Dead wood should be left on site, either in situ or as part of a brash pile, to benefit wildlife in the area.

5.2.3 Hedgerows across the whole site are to be cut on a rotational basis, i.e. not all hedgerows in the same year. This will maintain a resource of flowering and fruiting plants across the site, create nesting and foraging habitat for wildlife, and prevent hedgerows becoming leggy. Existing trees within hedgerows will be left to grow naturally and not cut. These will be clearly marked to ensure that they are not cut back during hedgerow trimming/maintenance works.

5.2.4 Established hedgerows will be cut between late September and February and no cutting or trimming is to be undertaken during the breeding bird season (1st March to 31st August inclusive).

5.2.5 Ground flora will be cut at the base of hedges on a flexible 2-3 year rotation to 150mm height, with arisings removed. This is to maximise the value of the habitat for overwintering and foraging insects and prevent scrub establishment.

New and infill Hedgerows

5.2.6 All canes, spirals or guards shall be regularly checked and adjusted or replaced as required. Bases of all hedges are to be kept weed-free during the first three years. After the first three years the ground flora is to be allowed to develop naturally in order to contribute to the wildlife value of the hedgerow and managed as an existing hedgerow.

5.2.7 Any litter accumulated around hedgerow bases is to be cleared at the same time as weed control operations.

5.2.8 All hedge lines shall be regularly watered in times of drought to field capacity and shall receive an application of slow-release fertiliser for the first three years.

5.2.9 Plants will remain upright and adjusted during treatment of weeds. Rabbit protection will be retained/replaced until the end of the establishment period no longer needed, all guards will be removed from Site and disposed of. This is to be checked annually.

5.2.10 All hedges shall be allowed to grow up to approximately 3m high or as specified in the Landscape Strategy and will be maintained at this height. Any plants that fail to thrive shall be replaced with stock to the original specification.

5.2.11 Annual inspection is to be undertaken in September to replace dead/diseased plants at the end of each growing season and to be replaced within the first five years after planting. Pruning will be undertaken to promote healthy growth, where required, between late September – February to avoid bird breeding season.

5.2.12 Bark mulch is to be topped up annually or as required, to maintain 50mm deep layer, until the plants have established.

5.2.13 Once new and infill sections of hedgerows have established, management operations are to reflect those as set out for existing hedgerows.

5.3 Woodland

Woodland Planting

5.3.1 During the establishment period all dead, dying or diseased trees/shrubs will be replaced with specimens of similar size and species by the appointed contractor. Dead wood should be left on site, either in situ or as part of a brash pile, to benefit wildlife in the area. If the failure of the plant is due to disease and the disease is considered likely to re-occur, then an alternative native species of local provenance may be used as a replacement with agreement form the LPA. The exact timing of the planting of replacement trees is dependent on the ground conditions; however, planting should take place between the months of December and February inclusive, this will allow the plants more time to establish a network of feeder roots before the onset of spring.

5.3.2 During the establishment period weeds around the base of each tree will be removed within a 1m to 1.5m radius, using approved hand-weeding or if necessary, herbicide treatment (applications in April, June and August). The herbicide handbook (English Nature, 2003) provides guidance on appropriate herbicide use in relation to nature conservation works. Where used, herbicides will be sprayed in appropriate weather conditions, to avoid affecting adjacent habitats.

5.3.3 Tree guards and stakes will also be checked and replaced where necessary and removed once trees are sufficiently established that they are no longer required.

5.4 Habitat Piles

5.4.1 A small proportion of wood (including dead wood) and grass removed during habitat management or other work operations can be added to the log pile refuge features as shown on the Landscape Strategy. These habitat piles will provide valuable invertebrate habitat and shelter for other species including small mammals/amphibians/reptiles. These should be placed in the same locations each year.

6 ECOLOGICAL MONITORING AND CONTINGENCY

6.1 Timings

6.1.1 The development of the biodiversity interest of the Site will be monitored over time by a suitably experienced ecologist. A walkover survey will be undertaken on years 1, 3 and 5 and 10. This will involve an inspection of the grassland, hedgerows and trees to ensure that they are being managed in a manner suitable for the enhancement of wildlife interest.

6.1.2 In addition, a habitat survey and condition assessment of the site will be undertaken to ensure created habitats are achieving their target condition as stated in the biodiversity metric calculations.

6.1.3 The management plan will be amended, if necessary, based on the monitoring recommendations.

6.2 Monitoring Criteria

6.2.1 Habitats will be monitored in accordance with the criteria set out with the Biodiversity Metric 3.1 Technical Supplement[6]. Habitats are expected to achieve the conditions set out within the Biodiversity Metric 3.0 Calculation Tool submitted with the original application and summarised below.

[6] Biodiversity Metric 3.0 – Technical Supplement.
http://publications.naturalengland.org.uk/publication/6049804846366720

Table 6.1: Expected condition of newly created habitats within the Site

Habitat type	Biodiversity metric 3.0 habitat type	Target condition	Time to achieve target condition (years)
Main body of grassland under and around solar panels	Modified grassland	Good	7
Meadow grassland	Other neutral grassland	Moderate	10
Woodland planting	Other woodland; broadleaved	Moderate	15
Ponds/ scrapes	Ponds (Non-Priority Habitat)	Moderate	3
Hedgerow	Native species rich hedgerow	Good	12

6.2.2 If inspected habitats are not meeting the description for the particular habitat type, are not achieving the target condition, or appear unlikely to achieve it, a suitably qualified ecologist will be consulted to determine appropriate changes to the management to enable to the proposed habitat type and/ or target condition to be achieved. Suggestions for management changes are outlined in the contingency measures section below, however the exact requirements will be dependent on the cause and extent of any failure.

6.2.3 If it is considered it is not possible to achieve either the proposed habitat type or target condition, the management regime and/or biodiversity calculator will be revised, rectification steps taken, and any additional contingency measures implemented as appropriate.

6.3 Contingency Measures

6.3.1 If the monitoring outlined above identifies that a habitat is not meeting the target condition, or is not meeting the description for the proposed habitat type, the following contingency measures may be employed:

Grasslands

Absence of herbs/ high cover of bare ground

6.3.2 If the herb layer is not establishing, or there are large areas of bare ground it may be appropriate to re-seed/oversow the area to maintain the desired species mix. This should be done using a suitable mix and following the methodology outline in the habitat creation section above. It may be necessary to create batches of bare soil to act as a seed bed prior to seeding.

Area is over-grazed

6.3.3 Should the area become over grazed, as will be indicated by poaching, bare ground, lack of species diversity and a uniform and short grass sward, it may be appropriate to reduce the grazing density. This could be achieved either through the removal of animals or by grazing for a shorter period each year with fewer stock.

Grasses are over-dominant

6.3.4 Should rank grasses become over-dominant the grazing intensity may need to be increased. This could be achieved either through the introduction of more animals or grazing for an extended period.

6.3.5 Alternatively, it may be appropriate to introduce yellow rattle to the grassland area by over-sowing. This plant parasitises grasses, reducing their competitive ability.

Nutrient levels too high

6.3.6 It is recognised that arable land can be high in nutrients, resulting in lack of species diversity and indicated by the dominance of a small number of competitive species (e.g., nettles, spear thistle, white clover, coarse grasses). The grassland is therefore expected to take some years to settle into a diverse community. Management and regular review of the grazing and cutting regimes (with removal of arisings) will over time gradually reduce nutrient levels. Cut and collect involves waiting for plants to reach a substantial height before mowing and then removing all arisings form the Site. Any nutrients taken in by the plants during growth will therefore be removed from the site. This method may take a number of years to be effective.

7 INDICATIVE MANAGEMENT SCHEDULE

7.1.1 The following management programme shows possible months in which habitat creation and management activities should be undertaken. Note that this schedule should be seen as a guide only and management should be informed by conditions on the Site and any changes to the management regime should be agreed with a suitably qualified ecologist

Initial Habitat Enhancement Year 1

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 1												
Grassland creation (*recommended)			✓*	✓*	✓	✓	✓	✓	✓			
Hedgerow and tree/shrub planting	✓	✓										✓*
Installation of bird nest and bat roost boxes	✓	✓							✓	✓	✓	✓

Habitat Management Year 2

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 2												
Initial management of grassland / meadows areas (targeted herbicide treatment of perennial weeds or cutting/topping where necessary)				✓		✓		✓				
Herbicide treatment or hand-weeding of hedgerow planting bed and surrounding planted trees				✓		✓		✓				
Trimming of new hedgerows	✓	✓								✓	✓	✓

Ongoing Annual Management

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Year 3 onwards												

Management Activity	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grassland cutting		✓						✓	✓			
Sheep gazing	✓	✓							✓	✓	✓	✓
Herbicide treatment or hand-weeding of hedgerow planting bed and surrounding planted trees (establishment period first five years)				✓		✓		✓				
Trimming of new hedgerows (up to year 3 and established)	✓	✓								✓	✓	✓
Established hedgerows cut on a 2 or 3 year cycle (no more than 1/3 cut in any one year).	✓	✓									✓	✓