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1 INTRODUCTION

1.1 Background

- 1.1.1 This Biodiversity Net-gain Note has been prepared by Avian Ecology Ltd. (AEL) on behalf of Harmony Energy in relation to the proposed battery storage development located on land at Ilmer in Buckinghamshire (the Site).
- 1.1.2 The Site location is provided in **Figure 1** of the *Ecological Assessment Report* and habitats located within the Site are provided in **Figure 4**.
- 1.1.3 The proposed development includes the construction, at least 40-year operation and subsequent decommissioning of a battery storage facility, with a capacity of 5MW, plus associated infrastructure as illustrated on the *Detailed Soft Landscaping Plan (Rev B)*.

1.2 Legislation, Policy and Guidance

- 1.2.1 Biodiversity net-gain in development is defined as “development that leaves biodiversity in a better state than before”.
- 1.2.2 The National Planning Policy Framework 2 (NPPF2, 2019¹) requires the demonstration of biodiversity net-gain with any planning applications. The accompanying National Planning Practice Guidance (NPPG²) states that using a metric is a pragmatic way to calculate the impact of a development and the net gain that can be achieved. It goes on to state that *‘tools such as the Defra biodiversity metric can be used to assess whether a biodiversity net-gain outcome is expected to be achieved’*.
- 1.2.3 In addition the NPPG states that *‘Biodiversity net-gain can be achieved on-site, off-site or through a combination of on-site and off-site measures’* and that this can involve the creation of new habitats, enhancement of existing habitats, creation of green infrastructure (street trees, public open space, green roofs etc.) and sustainable drainage systems and that *‘relatively small features can often achieve important benefits for wildlife, such as incorporating swift bricks and bat boxes in developments and providing safe routes for hedgehogs between different areas of habitat’*.
- 1.2.4 In addition, the document adopts guidance provided within the NPPF2, stating that development proposals should seek to *‘provide opportunities to incorporate biodiversity improvements in and around developments... especially where this can secure measurable net gains for biodiversity’* and that the local plan will *‘promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity’*.
- 1.2.5 The forthcoming Environment Bill 2019-21³ is currently at the consideration of amendments stage at the House of Commons and House of Lords (and therefore not yet adopted), it is understood that (once adopted – expected to be passed in Autumn 2021, however likely to be mandatory by 2023 at the earliest) the majority of developments in England will be required to provide a minimum of 10% biodiversity net-gain. Whilst this is not yet mandatory, Local Planning Authorities (LPAs) have begun to incorporate biodiversity net-gain policies into their Local Plans; Buckinghamshire Council has announced that following the Environment Bill, there will be a commitment to a minimum of 10% biodiversity net-gain for applications within Buckinghamshire. At the time of reporting, the submission of the Defra Metric (minimum of version 2.0) for applications in Buckinghamshire is

¹ <https://www.gov.uk/government/publications/national-planning-policy-framework--2>.

² <https://www.gov.uk/guidance/natural-environment>

³ <https://services.parliament.uk/bills/2019-21/environment.html>

expected, *'In assessing net gains in biodiversity, a best practice methodology for biodiversity accounting is expected to be used, for example based on the Defra metric, unless or until a local approach is set out in a future Supplementary Planning Document. Gains in other types of green infrastructure are likely to be measured both qualitatively and quantitatively'*⁴

1.3 Site Overview

- 1.3.1 The Site as illustrated by the red-line application boundary shown on **Figure 1** of the *Ecological Assessment Report* is approximately 2.49ha, located adjacent to the east of the operational Bumpers Solar Farm at approximate central grid reference SP 76809 06183.
- 1.3.2 A review of aerial imagery and from information gleaned from the extended Phase 1 habitat survey shows that the Site comprises an area of grassland with nearby hedgerows, trees and ditches. A small block of woodland lies 60m to the east with a railway line to the south and the A4129 to the north.
- 1.3.3 In the wider context the Site is surrounded by further extensive areas of arable and pastoral farmland and urban settlements.

⁴ Paragraph 6.155 of the DM34 policy within the Wycombe District Local Plan – Adopted August 2019
Bumpers Farm Battery Storage, Phase 2
Appendix 5: Biodiversity Net Gain

2 METHODOLOGY

Extended Phase 1 Habitat Survey

- 2.1.1 An extended habitat survey of the Site was undertaken on 21st June 2021 by S. Turner MSc a suitably qualified ecologist and botanist.
- 2.1.2 The survey followed UK industry standard Joint Nature Conservation Committee (JNCC) Phase 1 Habitat Methodology (JNCC, 2010)⁵.
- 2.1.3 The Study Area comprised the red line boundary and habitats identified within the Site are presented in **Figure 4** of the *Ecological Assessment Report*.
- 2.1.4 A full breakdown of survey methodology is outlined in Section 2.2 of the *Ecological Assessment Report*. The survey was extended to include the additional recording of specific features indicating the presence, or likely presence, of protected species, invasive species and other species of conservation value.

2.2 Defra Biodiversity Metric 3.0

- 2.2.1 The Defra Biodiversity Metric 3.0 provides a way of measuring and accounting for biodiversity losses and gains resulting from development or land management change and has been used to inform this Biodiversity net-gain Assessment.
- 2.2.2 The baseline habitat types were recorded using survey methodology following the UK industry standard JNCC Phase 1 Habitat Methodology (JNCC, 2010)⁶ and with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM), Technical Guidance Series '*Guidelines for Preliminary Ecological Appraisal, 2nd Edition*' (CIEEM, 2017)⁷.
- 2.2.1 The G-9 Translation Phase 1 tab within the Biodiversity Metric 3.0 was used to translate the Phase 1 habitat types into the UK Habitat Classification⁸ categories, with professional judgement used where habitats do not translate. Habitat areas (hectares) were calculated using GIS software. For scattered trees the Street Tree Helper tool was used to obtain a habitat area; guidance for the Street Tree Helper tool states that all trees should be classified as medium size.
- 2.2.2 Criteria set out within the Defra Biodiversity Metric 3.0 Technical Supplement⁹ were used to calculate the condition, ecological connectivity and strategic significance of the existing habitats.
- 2.2.3 Where habitats are located within a non-statutory designated site or if they are specifically covered by a local planning policy or management plan the strategic significance has been categorised as high. If a habitat has functional value but is not formally recognised in local policy the strategic significance has been categorised as medium. Where the habitat does not fall under any local policies and has limited functional value the strategic significance has been categorised as low.
- 2.2.4 Proposed habitat types, including for creation, enhancement and restoration, were directly assigned a UK Habitat Classification category e.g. poor semi-improved grassland translated to modified grassland.

⁵ JNCC (2010). Handbook for Phase I Habitat Survey – a Technique for Environmental Audit. JNCC, Peterborough

⁶ JNCC (2010). *Handbook for Phase 1 habitat survey – a technique for environmental audit*. JNCC, Peterborough.

⁷ CIEEM. (2019). *Guidelines for Preliminary Ecological Appraisal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester.

⁸ <https://ukhab.org/>

⁹ <http://publications.naturalengland.org.uk/publication/5850908674228224>

- 2.2.5 Hedgerows are accounted for separately in the Biodiversity Metric 3.0 as these are linear habitats and therefore are measured in kilometres. Units are not directly interchangeable between area-based habitats and linear habitats such as hedgerows.

3 RESULTS

3.1 Habitat Survey Results

Extended Phase 1 Habitat Survey

- 3.1.1 The habitats identified within the Site are presented in **Figure 2**. Photographs are presented in **Appendix 1** within the *Ecological Assessment Report*. The Extended Phase 1 habitat survey was conducted in suitable weather, with good visibility.
- 3.1.2 The Site, access and cable route is dominated by three main habitat types with two additional habitats as shown below in **table A5.1**

Table A5.1: Habitats within the Site.

Extended phase 1 Habitat survey Habitat type	UKHabs/ Metric habitat type	Habitat description
Arable Farmland	Cereal crop	At the time of survey, land within the Site was dominated by arable land with cereal crops being grown at the time of survey;
Poor semi-improved grassland	Modified grassland	Tall poor semi-improved grassland, containing red fescue <i>Festuca rubra</i> , soft brome <i>Bromus hordeaceus</i> , smooth meadow-grass <i>Poa pratensis</i> , Yorkshire fog <i>Dactylis glomerata</i> and creeping thistle <i>Cirsium arvense</i>
Species-poor hedgerows	Native hedgerow	Most field boundaries within the Site were dominated by species-poor hedgerows with hawthorn <i>Crataegus monogyna</i> and blackthorn <i>Prunus spinosa</i> as the dominant species.
Line of trees	Line of trees	Small section of line of trees located along the access route to the north. Species include elm <i>Ulmus procera</i> , hazel <i>Corylus avellana</i> and ash <i>Fraxinus excelsior</i> ;
Tall ruderals	Other neutral grassland	Small area dominated by willowherb species <i>Epilobium spp.</i> , spear thistle <i>Cirsium vulgare</i> , creeping thistle, prickly

		sow-thistle <i>Sonchus asper</i> , common nettle <i>Urtica dioica</i> and scattered scrub including bramble <i>Rubus fruticosus</i> and sycamore <i>Acer pseudoplatanus</i> .
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4 DEFRA METRIC 3.0 BIODIVERSITY NET-GAIN RESULTS

On site Defra Metric 3.0

- 4.1.1 The proposed development will build a battery storage facility within arable and pastoral-dominated farmland. Both habitats are considered to be of low ecological value and, particularly with arable farmland, the habitat is usually regularly disturbed through agricultural intensification. Additionally, the poor semi-improved grassland within the Site is not part of a management scheme and is considered to be of poor condition offer limited biodiversity benefits.
- 4.1.2 The current landscape proposals suggest that 1.2ha of land will be occupied by infrastructure for the battery storage facility including the battery storage and associated access roads. The remaining 1.29ha of land will be comprised of undisturbed arable farmland (following construction), the creation of newly planted 0.04 hectares of mixed structure scrub and a total of 45 standard native trees and the enhancement of c0.425ha of modified grassland into more species-rich structured grassland.
- 4.1.3 Additionally, there will be the planting of c380m of native species-rich hedgerows and c150m of native species-rich hedgerows with standard trees.
- 4.1.4 The BNG calculation based on the existing and proposed habitat areas before and after completion of the battery storage facility, demonstrates that an overall net loss of -16.40% Habitat Units.
- 4.1.5 However, the addition of the c530m of new native species hedgerow planting that will form part of the proposed development would increase the hedgerow net gain by 238.75%. Whilst linear feature units are not interchangeable with area-based units, this large increase in linear features within the Site will demonstrably benefit biodiversity, both by providing additional habitat in its own right and supporting a range of species and also by strengthening habitat links and connectivity in the local area over the long term as the hedgerow matures. Additionally, this newly created habitat will improve the functionality of habitats within the Site compared to the existing semi-natural habitats present within the Site at the time of application.

Offsite Defra Metric 3.0

- 4.1.6 As shown within the Biodiversity 3.0 Metric spreadsheet headline results (Figure 5.1), unmitigated, the proposed development will result in a biodiversity net-loss of -16.40% (-1.12 biodiversity units). However, a quantifiable BNG can be achieved through a combination of methods, including agreement for bespoke offsite mitigation.
- 4.1.7 The on-Site measures alone are not sufficient to enable a quantifiable BNG; therefore, the proposal for off-site habitat enhancements includes the conversion of an existing 0.579ha of species-poor semi-improved grassland/modified grassland located immediately adjacent to the western boundary of the Site, between the Site and adjacent solar farm, into a species-rich structured grassland using the same technique as that proposed within the Site.
- 4.1.8 When the forthcoming Environment Bill 2019-21 is formerly adopted and statutory mandatory net gain is introduced, it is proposed that where a development was unable to mitigate biodiversity loss

on site, the enhancement of off-site habitats, where available could help to achieve Biodiversity Net Gain for a development.

4.1.9 As a result of the proposed off-site habitat enhancement of adjacent grassland, the overall Biodiversity Net Gain of the development could achieve 13.15% (an increase of 0.9 habitat units).

4.1.10 **Figure A5.1** summarises the results of the Biodiversity Net-Gain Assessment. A breakdown of the calculations is provided in the Defra Biodiversity 3.0 Metric Excel spreadsheet which is provided separately in **Appendix 3**.

Figure A5.1: Biodiversity Net-Gain Headline Results

On-site baseline	Habitat units	6.86
	Hedgerow units	1.56
	River units	0.00
On-site post-intervention <small>(Including habitat retention, creation & enhancement)</small>	Habitat units	5.74
	Hedgerow units	5.28
	River units	0.00
On-site net % change <small>(Including habitat retention, creation & enhancement)</small>	Habitat units	-16.40%
	Hedgerow units	238.75%
	River units	0.00%
Off-site baseline	Habitat units	1.74
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention <small>(Including habitat retention, creation & enhancement)</small>	Habitat units	3.76
	Hedgerow units	0.00
	River units	0.00
Total net unit change <small>(including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	0.90
	Hedgerow units	3.72
	River units	0.00
Total on-site net % change plus off-site surplus <small>(including all on-site & off-site habitat retention, creation & enhancement)</small>	Habitat units	13.15%
	Hedgerow units	238.75%
	River units	0.00%

5 BIODIVERSITY NET-GAIN STRATEGY

5.1 Discussion

5.1.1 Currently there is no statutory requirement for the use of the DEFRA Biodiversity Metric 3.0 (or similar metric)¹⁰ to provide quantifiable evidence of biodiversity net-gain, however a measurable quantifiable biodiversity net-gain assessment is currently a requirement under Buckinghamshire Council's local planning policies, although no specific percentage requirement has yet been adopted.

¹⁰ The forthcoming Environment Bill 2019-21 is currently at the consideration of amendments stage at the House of Commons and House of Lords (and therefore not yet adopted), it is understood that (once adopted – likely to be introduced no sooner than 2022) the majority of developments in England will be required to provide a minimum of 10% biodiversity net-gain. Whilst this is not yet mandatory, Local Planning Authorities (LPAs) have begun to incorporate biodiversity net-gain policies into their Local Plans; currently Buckinghamshire Council has not adopted a commitment to a minimum of 10% biodiversity net-gain.

- 5.1.2 The production of an indicative development design was an iterative process and in-line with current guidance¹¹ AEL were brought into the project team at an early stage to ensure that biodiversity impacts were considered and avoided/mitigated for as far as reasonably possible.
- 5.1.3 The DEFRA Biodiversity Metric 3.0 provides a quantitative biodiversity net-gain assessment based on habitat impacts alone; however, the values produced do not take into account other proposed qualitative biodiversity enhancements. Current guidance advises that both quantitative and qualitative biodiversity gains should inform a biodiversity assessment to demonstrate that the net-gains are commensurable with biodiversity affected by the development.
- 5.1.4 A Biodiversity Net Gain has been achieved through the Defra metric 3.0, with the inclusion of offsite habitat enhancements, as well as those included within the Site boundaries. Furthermore, whilst off site habitat proposals add to the Defra metric's quantifiable net gain percentage, the baseline habitats located within the Site were of low ecological value, whereas the inclusion of new and enhanced habitats including structured grassland, scrub and linear features including hedgerows and trees have increased the overall higher value habitat within the Site.

5.2 Quantifiable Biodiversity Net-Gain Proposals

- 5.2.1 The following habitat enhancement and creation methods are proposed within the Biodiversity 3.0 Metric and once formerly adopted, these enhancement and creation methods can be informed by a thirty year Biodiversity Management Plan:
- 5.2.2 Multiple areas of green open space; these will consist of:
- Planting of 45 standalone standard native trees measuring a total of 0.18ha
 - 0.04ha of newly created structured scrub; and,
 - 0.53km of native species-rich hedgerow planting, with some sections containing additional native trees.
 - 0.425ha of other neutral grassland habitat enhancement through the inclusion of a species-rich and diverse seed mix and subsequent management.
- 5.2.3 Additionally, compensation through Off-site habitat creation includes the enhancement of 0.579ha of grassland through the inclusion of a species-rich and diverse seed mix and subsequent management.
- 5.2.4 Whilst the habitat proposals within the Site does not achieve a measurable Biodiversity Net Gain through the Defra metric, the Site's functionality and overall value to wildlife is greater as a result of the landscape enhancements proposed as a result of the development, and therefore it does meet the wider definition of biodiversity net gain. Additionally, the inclusion of off-site habitat enhancements has allowed the development to achieve an overall measurable Biodiversity Net Gain through the Defra metric 3.0.

¹¹<https://cieem.net/wp-content/uploads/2019/02/C776a-Biodiversity-net-gain.-Good-practice-principles-for-development.-A-practical-guide-web.pdf>