

Steeple Renewables Project

Appendix 7.12: Preliminary
Biodiversity Gain Report

Issuing office

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1 Summary of possible Biodiversity Gain outcomes

Type of biodiversity unit	Indication of possible minimum biodiversity gain	Possible strategy for achieving biodiversity gain*
<p>Habitats</p> <p>Note: at this stage all the land within the Biodiversity Mitigation Areas has been included within the Site baseline but habitat creation and/or enhancement measures only relate to 1.5 ha of arable field margin in the post-development assessment. In other words, there is existing habitat that is currently shown as being retained with no change that could also be available for habitat creation or enhancement to further contribute to the biodiversity gain outcome, to help meet the Government's biodiversity gain objective, and that is proportionate to the scale and nature of the development. Section 5 'Consideration of assumptions and limitations' provides further detail.</p>	<p>+10.69%</p> <p>(+225.36 units gained)</p>	<p><u>>10% gain could be achieved if:</u></p> <ul style="list-style-type: none"> - 170 ha out of 520 ha (33%) of the grassland under and between arrays will be lawn-type grassland with 6-8 plant species every square metre on average (i.e. '<i>modified grassland</i>' in moderate condition). - Remaining 350 ha will be species poor (akin to sports pitches or heavily grazed pasture). - Field margins will largely be retained (1.18 ha out of the 22.34 ha will be lost). Habitats such as woodlands, ponds, trees, orchards will be retained. The following habitats will be created in place of arable land: 6 ha of developed land/hardstanding, 30 ha of other neutral grassland across the Site,
	<p>+20.19%</p> <p>(+425.40 units gained)</p>	<p><u>>20% gain could be achieved if:</u></p> <ul style="list-style-type: none"> - 300 ha out of 520 ha (58%) of the grassland under and between arrays will be lawn-type grassland with 6-8 plant species every square metre on average (i.e. '<i>modified grassland</i>' in moderate condition), - Remaining 220 ha will be species poor (akin to sports pitches or heavily grazed pasture). - Field margins will largely retained (1.18 ha out of the 22.34 ha will be lost). Habitats such as woodlands, ponds, trees, orchards, and existing buildings/roads will be retained. The following habitats will be created in place of arable land: 6 ha of developed land/hardstanding, 30 ha of other neutral grassland across the Site,
<p>Hedgerows</p> <p>Note: although two different scenarios for achieving a 10% gain are presented here, the final proposals are likely to be a mix of these scenarios. (i.e., a combination of new planting and enhancement). This assessment assumes no</p>	<p>+10.01%</p> <p>(+54.26 units gained)</p>	<p><u>Gains via new hedgerow planting only:</u></p> <p>Creation of 6.12 km of new hedgerow. To comprise a 50:50 mix of:- <i>Species-rich native hedgerow with trees - associated with a bank or ditch</i> (good condition)</p> <p>and</p> <ul style="list-style-type: none"> - <i>Species-rich native hedgerow</i> (good condition)
	<p>+10.39%</p>	<p><u>Gains via enhancements of existing hedgerows only:</u></p> <ul style="list-style-type: none"> - Enhancement of all the <i>Native hedgerow</i> along the 'minor green corridor' as well as one third of the <i>Native</i>

Type of biodiversity unit	Indication of possible minimum biodiversity gain	Possible strategy for achieving biodiversity gain*
more than 550 m of hedgerow loss will occur.	(+56.33 units gained)	<i>hedgerow</i> in other areas of the Site to <i>Native hedgerow with trees</i> .
<p>Watercourses/Rivers</p> <p>Note: This will be subject to agreement with consultees (including the Environment Agency, Internal Drainage Board, Lead Local Flood Authority) as to the feasibility of various options.</p>	<p>Unconfirmed – potentially +13.73% (+16.59 units gained)</p>	<ul style="list-style-type: none"> - No change to river habitats. - 4.95 km of ditches that are currently in poor condition enhanced to moderate condition through increases to marginal and aquatic plant diversity and reduction of nutrient and pollution inputs. - Other options for further gain will be explored with consultees, and could include the creation of new watercourses / wet ditches which would deliver further gains.

*Further details and assumptions are provided in full in Section 5

2 Introduction

- 2.1 This report provides the preliminary biodiversity gain assessment undertaken by BSG Ecology, on behalf of RES (“the Applicant”), for the Steeple Renewables Project (“the Site”). By way of background context, The Environment Act 2021 includes a provision for National Significant Infrastructure Projects (NSIPs) to deliver a Biodiversity Net Gain (BNG), with the biodiversity gain objective defined as at least a 10% increase in the pre-development biodiversity value of the on-site habitat. It is Defra’s intention that the 10% gain should apply to terrestrial NSIPs accepted for examination from November 2025. Prior to this mandatory period commencing, the 10% biodiversity gain target is considered to be voluntary.
- 2.2 The purpose of this report is to identify indicative minimum biodiversity outcomes of changes to the existing Site baseline biodiversity values, measured using the Statutory Biodiversity Metric (SBM)¹, to inform the Preliminary Environmental Information Report (PEIR); as such, the assessment is informed by and reliance is placed upon the ‘draft indicative parameters plan’ drawing *04954-RES-LAY-DR-LE-018 rev 1*, prepared by RES on 11 July 2024, i.e. this assessment is not yet based on the final detailed Proposed Development design which is not yet available. This means that the biodiversity outcomes are likely to change as the design of the Proposed Development. This report:
- Identifies baseline habitat values in unit terms using the SBM across the Site.
 - Documents the steps taken in the early-stage ecological design input to the emerging layout design to avoid or minimise impacts on existing habitats, as part of the application of the National Planning Policy Framework (NPPF, December 2023²) mitigation hierarchy which informs decision making and the biodiversity gain hierarchy which must be taken account of by the decision maker. This approach is broadly in line with Town and Country Planning Act 1990 development in the absence of NSIP biodiversity gain guidance.
 - Considers the habitat creation and enhancement opportunities that may be applied to achieve at least a 10% biodiversity gain (measured using the SBM).
- 2.3 This is also a preliminary assessment because ecological survey data are still being gathered to inform the existing Site baseline and, as referred to above, the design of the Proposed Development is not finalised at this stage; this assessment will be updated and submitted with the subsequent Environmental Statement (ES). This report identifies relevant assumptions and limitations at Section 5.
- 2.4 For ease of reference the following will be terms referred to within this report to define areas within the Site:
- Proposed Solar Areas: areas within the Site which have been provisionally identified for locating the solar panels, battery storage and other associated infrastructure.
 - Biodiversity Mitigation Areas (Eastern and Western): areas of the Site that would not be used for development, and provisionally identified for use as biodiversity mitigation and enhancement.
 - The Site: collectively including the Proposed Solar Areas and Biodiversity Mitigation Areas.

Sources of information

- 2.5 BSG Ecology has relied upon the following information sources in the preparation of this assessment:
- The ‘red line’ boundary of the Site indicated on the 11 July 2024 ‘draft indicative parameters plan’ drawing *04954-RES-LAY-DR-LE-018 rev 1*, prepared by RES (see appendix 1 of this report). It is noted that the parameters plan used as the basis of this iteration of the biodiversity gain assessment includes a previous version of the application boundary which has now been superseded by that shown as by Figure 2.2. of the Preliminary Environmental Information Report (PEIR). The differences between the two boundaries are reasonably minor given the scale of the Site. It is the intention that this biodiversity gain assessment and report will be

¹ Natural England (2024) *Statutory biodiversity metric calculation tool (macro enabled)*, last updated 23 July 2024 [online] Available at: <https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides> Accessed 05 November 2024.

² Ministry of Housing, Communities & Local Government (2023) *National Planning Policy Framework*. Updated December 2023.

updated as the project evolves using updated boundaries and layouts. The biodiversity gain assessment outcomes will be shared with relevant consultees as appropriate to demonstrate that the necessary biodiversity gain can be delivered.

- The layout of the Proposed Development has been based on assumptions agreed between the Applicant, Pegasus, and BSG Ecology in April 2024 (refer to Section 5 below).
- Habitat classification systems published by UKHab Ltd³ and in Natural England⁴.
- Habitat survey data used to delineate habitat areas, lengths and locations and conditions, arising from the 2024 survey work undertaken on 29 and 31 January, 12, 13, and 14 February, 19 March, 15, 16, 18 April, 16 and 21 May, and between 16 and 17; and 23 and 25 July (Figure 7.12.1a and b).
- Hedgerow information produced by Barton Hyett Associates (refer to Arboricultural Survey Report dated 22 May 2024⁵). Small disparities in hedgerow lengths may be evident between the arboricultural survey report and this assessment as a result of the varying definitions of hedgerows, lines of trees, etc. under the UK habitat classification, and whether the features are wholly within the Site boundary.
- The published SBM and the associated User Guide⁶ and technical annex⁷ applicable at the date of the biodiversity gain assessment, as referred to in the Methodology section of this report.
- The following documents were consulted in relation to strategic significance of habitats, it is anticipated that further documents related to strategic significance will be reviewed in later iterations of this biodiversity assessment in line with the Nottingham and Nottinghamshire BNG Framework⁸ and the Nottinghamshire & Nottingham Local Nature Recovery Strategy that is in preparation (also refer to Section 5):
 - Bassetlaw Local Plan 2020-2038 policies maps⁹.
 - Draft Local Habitat Map¹⁰.

Personnel

- 2.6 This assessment was prepared by Emily McVean MCIEEM (Senior Ecologist at BSG Ecology). Emily has significant experience in identifying, assessing and mapping habitats, including undertaking botanical surveys to National Vegetation Classification (NVC) level, with a Level 4 Field Identification Skills Certificate (FISC) from the Botanical Society of Britain and Ireland. Emily received legal training on mandatory BNG from specialist environmental solicitors (Freeths LLP), and further training (internally provided by BSG Ecology and externally provided by CIEEM) on the use of the Biodiversity Metric (covering more than one version and including the SBM), condition assessments, mapping, and designing for BNG. Emily is also certified by Modular River Survey to undertake River Condition Assessments.
- 2.7 The field surveys were undertaken by suitably experienced professional ecologists (refer to Appendix 7C: Habitats Baseline Report for further details) within BSG Ecology, including Emily, with field survey support provided by an approved subconsultant to BSG Ecology. Spatial analysis has been completed by Geographic Information System Specialists within BSG Ecology. The SBM Calculator Tool has been completed by Emily.

³ UK Habitat Classification Working Group (2023) UK Habitat Classification – Habitat Definitions V2.0 at <http://ecountability.co.uk/ukhabworkinggroup-ukhab>

⁴ Natural England (2024b) Statutory Biodiversity Metric - Technical Annex 1- Condition Assessment Sheets and Methodology. February 2024. Natural England.

⁵ Barton Hyett Arboricultural Consultants (2024) Arboricultural Survey Report, Steeple Renewables Project, 22 May 2024.

⁶ Natural England (2024) *Statutory Biodiversity Metric User Guide*. Natural England.

⁷ Natural England (2024b) *Statutory Biodiversity Metric - Technical Annex 1- Condition Assessment Sheets and Methodology*. February 2024. Natural England.

⁸ BNG Working Group for Nottingham and Nottinghamshire (2024) *A Biodiversity Net Gain Framework for Nottinghamshire and Nottingham*, Version 1 October 2024.

⁹ <https://www.bassetlaw.gov.uk/planning-and-building/bassetlaw-local-plan-2020-2038/bassetlaw-local-plan-2020-2038-adoption/bassetlaw-local-plan-policies-map/> [accessed 05 September 2024]

¹⁰ Nottinghamshire & Nottingham Local Nature Recovery Strategy (2024) *The Local Habitat Map* [online] Available at: <https://www.nottinghamshire.gov.uk/planning-and-environment/local-nature-recovery-strategy-for-nottinghamshire/local-habitat-map> Accessed 01 November 2024.

- 2.8 This report has been reviewed by Daniel Foster MCIEEM (Principal Ecologist at BSG Ecology) and Kirsty Kirkham MCIEEM (Director at BSG Ecology). Daniel and Kirsty have a respective 19 and 31 years' professional ecological experience. Daniel is the Project Manager within BSG Ecology on the Steeple Renewables Project. He completed the technical review of the baseline information and post-development proposals. Kirsty was formally recognised in 2023 in relation to her work on biodiversity gain in the ENDS Report Power List 2023¹¹ and, in addition to Daniel, Kirsty has also completed technical review of the assessment.

¹¹<https://www.endsreport.com/article/1823867/power-list-2023-uks-100-influential-environmental-professionals>

3 Methodology

- 3.1 The biodiversity gain assessment identifies a measure of biodiversity change using the SBM¹² and the associated User Guide¹³ and other relevant guidance, to calculate the biodiversity gain outcome of the Site development.
- 3.2 The SBM is a proxy tool used to measure biodiversity losses and gains in relation to habitats (three types: area based habitats, hedgerows and watercourse) using biodiversity unit terms. The SBM has been used to calculate a preliminary biodiversity baseline value of the Site before the implementation of the Proposed Development and to provide a provisional value after the Proposed Development is built out and complete.
- 3.3 The interaction between the NPPF mitigation hierarchy and the biodiversity gain hierarchy is also considered. Relevant local planning policy and supplementary planning guidance, including local strategies, and industry good practice principles have been considered (also refer to policy and guidance described in Appendix 7I: Legislation and Policy). Reference has also been made to the emerging Nottinghamshire & Nottingham Local Nature Recovery Strategy Local Nature Recovery Strategy (LNRS) (in prep). The principles of this preliminary biodiversity gain assessment were introduced to the Nottinghamshire County Council and Bassetlaw District Council Ecologists by BSG Ecology, RES and Pegasus Group during a meeting on 07 November 2024.
- 3.4 The Microsoft Excel based SBM will be supplied with the formal application and should be seen in conjunction with the report and accompanying figures. For the purposes of the PEIR, the SBM is available on request given that numerous options are presented and under consideration as part of the evolving design of the Proposed Development.

¹² Natural England (2024) *Statutory biodiversity metric calculation tool (macro enabled)*, last updated 23 July 2024 [online] Available at: <https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides> Accessed 05 November 2024.

¹³ Natural England (2024) *Statutory Biodiversity Metric User Guide*. Natural England.

4 Results

- 4.1 The biodiversity gain calculations are split into their respective unit types in line with the requirements of the SBM, which cannot be combined and must each individually achieve at least a 10% gain for the SBM requirements to be satisfied. In this report, the respective unit types are referred to as habitat units (HaU), hedgerow units (HeU) and watercourse units (WaU) for clarity. Please refer to section 5 for details of any assumptions and limitations in relation to completing the SBM for each of the unit types. See Section 6 Figures for the relevant habitat, hedgerow and watercourse habitats recorded to inform the assessment.
- 4.2 Following the unit assessments, this section provides information under a series of subheadings that is relevant to current Planning Practice Guidance (PPG)¹⁴ 'minimum information' validation requirements associated with biodiversity gain and this information is also relevant to the completion of the future Biodiversity Gain Plan (BGP)¹⁵ in due course. The early completion of the biodiversity gain strategy during this Proposed Development design is considered appropriate to manage the potential risks and opportunities around the biodiversity gain statutory framework requirements that will apply in due course for nationally significant infrastructure projects.
- 4.3 The BGP will be completed using the relevant Defra BGP template¹⁵ available at that time.

Habitat unit assessment

- 4.4 Table 7.12.1 below shows the preliminary HaU outcomes. The ability for habitats to be created under and around the solar arrays is considered to have a significant influence on the SBM HaU outcome. As noted in section 5, it has been assumed that the areas under and between the solar arrays will be *modified grassland* (i.e. a less species diverse grassland managed for agricultural or amenity purposes akin to grazing pasture, playing fields, or lawns). However, solar farm and biodiversity related research suggests that higher plant diversity can be readily achieved under and between arrays¹⁶, which could mean that higher distinctiveness habitat (such as '*other neutral grassland*') could also be created at least in part, depending on soil conditions and ground preparation works. In this instance, however, to create *other neutral grassland* it is considered likely that significant ground preparation works would be necessary to change the soil nutrient status (soil analysis of the Site is currently underway at the time of writing). The maintenance of *other neutral grassland* amongst the arrays for the mandatory 30-year period would also require a conservation-led management approach during the operational life of the solar farm, which would also influence the stocking levels of animals for example if to be managed by sheep grazing.
- 4.5 Ground preparations to create *modified grassland* are considered more likely to be achievable at this stage.
- 4.6 The preliminary baseline value of the Site is 2,107.27 HaU, to attain a SBM HaU outcome of at least +10% then the Proposed Development needs to deliver a further 120.72 HaU (to make a total of 2,317.99 HaU), as well as compensating for assumed habitat losses (equivalent to -1,263.97 HeU).

Assessment of HaU options

- 4.7 For the purposes of this biodiversity gain assessment, it has been assumed that the grassland will be of relatively low botanical diversity (i.e. *modified grassland*), but various target condition options have been applied during the assessment and the outcomes presented, giving the minimum biodiversity gain figure that can be achieved on the Site.
- 4.8 If poor condition *modified grassland* is created under and between arrays in all fields, and no habitat enhancements within the Biodiversity Mitigation Areas are undertaken, then the Proposed Development would not achieve a 10% HaU biodiversity gain. The Proposed Development would

¹⁴ DLUHC [Department for Levelling Up, Housing and Communities] (2024) *Guidance Biodiversity net gain, Planning practice guidance, 14 February 2024* [online] Available at: <https://www.gov.uk/guidance/biodiversity-net-gain> Accessed 01 March 2024.

¹⁵ Defra (2024) *Form biodiversity gain plan* [online] Available at: <https://www.gov.uk/government/publications/biodiversity-gain-plan> Accessed 01 November 2024.

¹⁶ Solar Energy UK (2023) *Solar Habitat: Ecological trends on solar farms in the UK*. [online] available at: https://solarenergyuk.org/wp-content/uploads/2023/05/Solar-Energy-UK_-Habitat-Report-2023.pdf Accessed 15 May 2024.

also fail to meet the habitat trading rules that require like-for-like or better habitats to be provided. Poor condition modified grassland habitat would usually be species-poor (fewer than 6 plant species per m²), with at least 75% cover of grass species – or it may be slightly more diverse but have other indicators of poor condition such as bare patches and damage caused by livestock or machinery. It may have scattered areas of scrub or bracken or invasive species present. This option of all created grassland being in poor condition is not considered any further in this assessment.

- 4.9 If moderate condition *modified grassland* is created, then the areas under and between the arrays would have to support 6-8 plant species per m² (including at least two non-grass plants), which is considered to be achievable if an appropriate seed mix is used together with the manufacturer recommended preparatory works and appropriate subsequent management. The cover of scrub, bracken, invasive weeds would require control as part of ongoing management; such management is considered to be reasonably possible based on the current absence of bracken and invasive non-native weeds from the Site and the cutting management regime that would be implemented to prevent scrub developing (i.e. annual cuts as a minimum). The proposed areas of grassland around and under the arrays is estimated to be 520 ha in size in total. Based on the assumptions outlined in this report, i.e. that areas primarily enhanced for skylark mitigation do not count towards the calculation, if at least 170 ha (out of the 520 ha) of cropland under and between arrays is subject to moderate condition *modified grassland* creation, then more than 10% HaU biodiversity gain is likely to be achieved. If at least 300 ha (out of the 520 ha) of cropland under and between arrays is subject to moderate condition *modified grassland* creation, then more than 20% HaU biodiversity gain could be delivered. In either the 'more than 10%' and 'more than 20%' scenarios, the remaining areas of land under and between arrays are assumed to be subject to poor condition modified grassland creation.
- 4.10 To meet the trading rules that form part of the SBM, *arable field margin* habitat must be compensated like-for-like, meaning that no other type of habitat creation can compensate for loss of *arable field margins*. Therefore, the creation of new *arable field margins* must be undertaken. This would be best applied in the Western Biodiversity Mitigation Area, which will be retained as cropland. It has not been assumed that the existing grassy margins (*other neutral grassland*) can be converted to this habitat type, as they currently function as tracks and as such are not primarily managed for biodiversity purposes - it would also result in the loss of the *other neutral grassland* in the SBM, which is to be avoided where possible in line with the biodiversity gain hierarchy. Based on the current design assumptions, 1.5 ha of arable field margins should be created (equivalent to 1.25 km length of margin that is 12 m wide) to meet the trading rules, which is considered to be feasible in place of cropland within the Western Biodiversity Mitigation Area.

Outcome of HaU assessment

- 4.11 Given the above, **it is considered likely that a minimum of 10% HaU biodiversity gain can be achieved** and the habitat trading rules can be met.
- 4.12 This outcome takes into account that land to be used primarily for skylark mitigation (i.e. Environmental Impact Assessment [EIA] mitigation) cannot fully contribute to biodiversity gain. The current value of the land is shown in the baseline assessment, but skylark habitat creation is excluded from the post-development scenario; hence it is demonstrated that the proposed development can achieve a sufficient gain for habitats without the benefit of the skylark measures.

Table 7.12.1: Preliminary biodiversity outcomes for HaU under different assumed scenarios (refer to Section 5 for assumptions and limitations)

Post-development scenario for created grasslands under and between arrays*	Estimated change in HaU (baseline total = 2,107.27 HaU)
All of the modified grassland under and between arrays targeted <u>poor condition</u>	-37.53 HaU -1.78% (trading rules not satisfied)
170 ha out of 520 ha (33%) of the modified grassland under and between arrays targeted as <u>moderate condition</u> , and the remainder targeted as poor condition	+225.36 +10.69% (trading rules satisfied)
300 ha out of 520 ha (58%) of the modified grassland under and between arrays targeted as <u>moderate condition</u> , and the remainder targeted as poor condition	+425.40 +20.19% (trading rules satisfied)

*Summary of the measures under and between arrays only, refer to Section 5 for further detail of other habitats assumed to be retained or created in the Solar Development Area.

Hedgerow unit assessment

- 4.13 Table 7.12.2 shows the preliminary HeU outcomes. To inform the assessment, it is assumed at this stage that the Proposed Development will result in 550 m of hedgerow loss (arising from construction of the BESS, construction accesses, and maintenance roads). Information relevant to the 'strategic significance' of hedgerows has also been derived from draft information to support the Nottinghamshire & Nottingham Local Nature Recovery Strategy. Further information on the assumptions is provided in Section 5. There are ca 65 km of existing hedgerow on Site, of which 6.3km has been assigned a strategic significance multiplier, as referred to in Section 5.
- 4.14 The preliminary baseline value of the Site is 541.99 HeU, to attain a SBM HeU outcome of at least 10% then the Proposed Development needs to deliver a further 54.2HeU (to make a total of 596.19 HeU), as well as compensating for hedgerow losses (equivalent to -5.7 HeU).

Assessment of HeU options

- 4.15 For the purpose of this assessment, it is assumed that any hedgerow creation would comprise a 50:50 mix *Species-rich native hedgerow with trees - associated with a bank or ditch*, and *Species-rich native hedgerow* – these will achieve good condition and are not assumed to have strategic significance at this stage. This would allow for some prominent hedgerow features (i.e. those with trees) to be created where there is little risk of overshadowing solar arrays, and less prominent features where solar array shading is to be avoided.
- 4.16 To achieve the minimum 10% HeU gain by the creation of new hedgerows, a total length of 6.12 km of new hedgerow planting would be required.
- 4.17 To achieve the minimum 10% HeU gain by the enhancement of the existing hedgerow resource only, it is considered that this is achievable by increasing the distinctiveness of the existing hedgerow types. This is because the condition score cannot be improved for 75% of the existing hedgerows as they are already in good condition; with those in moderate condition each having varying reasons for not being able to achieve good condition (this also means that it is considered that the ability to change the condition status would be more complex to achieve and carry an increased risk of failure). It is anticipated that increasing the distinctiveness, by adding new standard trees or by increasing the hedgerow species number, may also consequently lead to a change in the hedgerow condition in some cases, for example, where gappiness is causing condition criteria not to be met. In this assessment, however, no change to the condition score has been assumed for hedgerows to manage the risk of overcommitting to a condition change that is then found not to be practical to achieve.
- 4.18 If a third of the *Native hedgerow* that does not have strategic significance, and the entire length of the *Native hedgerow* along the 'minor green corridor' that does have strategic significance is enhanced to *Native hedgerow with trees*, then this would be sufficient to attain a minimum 10% gain

in HeU (Figure 7.12.4). This would require additional planting within or alongside 15.22 km of the hedgerows to ensure 'trees' are present every 20-50 m, which may require planting of 300-760 new trees respectively.

- 4.19 An alternative option may be that a combination of enhancement and creation is applied to achieve at least 10% gain.
- 4.20 Opportunities for hedgerow creation should be focussed on adding new connectivity across the Site, which may be further informed by results of bat activity monitoring. Possible opportunities exist along new trackways and areas of the Site or field boundaries that do not currently have hedgerows.

Outcome of HeU assessment

- 4.21 The outcome of the HeU assessment is that if a combination of new hedgerow creation and/or existing hedgerow enhancement forms part of the Proposed Development design as described above then **a minimum of 10% gain in HeU can be delivered** (Table 712.2).

Table 712.2: Preliminary biodiversity outcomes for HeU under different assumed scenarios (refer to Section 5 for assumptions and limitations)

Post-development scenario for hedgerows (all options assume 550 m of hedgerow loss during construction equivalent to -5.7 HeU)	Estimated change in HeU (baseline total = 541.99 HeU)
Creation of 6.12 km of new hedgerow. To comprise a 50:50 mix of: <i>Species-rich native hedgerow with trees - associated with a bank or ditch, (good condition)</i> and <i>Species-rich native hedgerow, (good condition)</i>	+54.26 HeU +10.01% (trading rules satisfied)
Enhancement of one third of the <i>Native hedgerow</i> that does not have strategic significance, and 100% of the <i>Native hedgerow</i> along the 'minor green corridor' that does have strategic significance to <i>Native hedgerow with trees</i> (with their original conditions being moderate or good)	+56.33 HeU +10.39% (trading rules satisfied)

Watercourse unit assessment

- 4.22 Table 7.12.3 shows the preliminary WaU outcomes. It is assumed that all ditches and rivers will be retained (i.e. there will be no losses to address, and no new in channel or riparian encroachment to rivers and ditches - acknowledging that riparian encroachment already exists on many ditches due to agricultural management being considered encroachment¹⁷). The Proposed Development is required to provide a 10% increase in watercourse units regardless of whether any impact or loss occurs.
- 4.23 The preliminary baseline value of the Site is 120.83 WaU. To attain a SBM WaU outcome of at least 10%, the Proposed Development needs to deliver a further 12.08 WaU (to make a total of 132.91 HeU).
- 4.24 To inform this assessment, liaison was undertaken between BSG Ecology and the project flood risk and drainage engineers/hydrologists (RSK Land & Development Engineering) and RES on 20 June 2024 and 07 August 2024. The aim of the liaison was to understand the feasibility and implications of ditch enhancements/creation on flood risk and drainage. It was determined that changes to the ditch channels and creation of new ditches was not preferable.

¹⁷ As specified on page 41 of the Statutory Biodiversity Metric User Guide (Natural England, 2024a)

Assessment of WaU options

- 4.25 Since some watercourse features on Site function as land drainage and flood risk management features, in order to avoid the risk of change to current watercourse management practice, engineered ditch enhancement options such as bank reprofiling or dredging, or creation of new ditches, is understood not to be preferred¹⁸. Therefore, these measures are not currently proposed for the purpose of biodiversity enhancement. No changes to the ‘other river’ habitats (which include the Catchwater Drain and Mother Drain) are currently proposed due to their importance in flood management. It is anticipated that the gain to WaU will be achieved via changes to vegetation management and planting/seeding of aquatic, emergent, and/or marginal plants within smaller field ditches only (no tree planting).
- 4.26 Seventeen ditches (4.95 km) that are currently in poor condition could achieve moderate condition if the measures below are applied to increase aquatic and marginal plant diversity (Figure 7.12.4). It should be noted that this enhancement ability relies upon other statutory bodies formally agreeing with RES to changes in ditch habitat management practice which will be relevant to their land drainage management practice. To this end, consultation with the Environment Agency, Trent Valley Internal Drainage Board and the Lead Local Flood Authority is currently underway regarding these proposals:
 - Manage the ditch vegetation on a 10-year cutting rotation¹⁹, and/or on one bank only (allowing some sections to become well-structured vegetation that is allowed to seed/fruit while other sections are cut to 10cm sward height in winter to control long-term scrub growth).
 - Possibly plant aquatic and emergent plant species as plug plants and reed transplants every 10-20m (secured with pegs and hessian liner if required) . Plants to be native, sourced from the UK and grown to Flora Locale guidelines. It is anticipated that nutrient and pollutant inputs into the ditches will reduce as an indirect result of the change in land use from agricultural land to a solar farm.
- 4.27 Two of the ditches have been identified as possibly needing the additional measure:
 - Targeted vegetation cutting/thinning on rotation (to control scrub/reeds in addition to regular management).

Outcome of WaU assessment

- 4.28 The outcome of the WaU assessment is that if 4.95 km of ditches that are currently in poor condition are enhanced to moderate condition as part of the Proposed Development design, then **a minimum 10% gain in WaU can be delivered** (Table 7.12.3).

Table 7.12.3: Preliminary biodiversity outcomes for WeU under different assumed scenarios (refer to Section 5 for assumptions and limitations)

Post-development scenario for watercourses	Estimated change in WaU (preliminary baseline total = 120.83 WaU)
4.95 km of ditches that are currently in poor condition are enhanced to moderate condition through increases to marginal and aquatic plant diversity and reduction of nutrient and pollution inputs	+16.59 HeU +13.73% (trading rules satisfied)

¹⁸ As discussed during meetings between the project ecologists (BSG Ecology), the project flood risk and drainage engineers/hydrologists (RSK Land & Development Engineering) and RES on 20 June 2024 and 07 August 2024.

¹⁹ As per Defra Sustainable Farming Incentive pilot scheme guidance on managing ditches for wildlife, Defra (2024) *Create and manage ditches for wildlife* [online] Available at: <https://defrafarming.blog.gov.uk/create-and-manage-ditches-for-wildlife/> Accessed 05 November 2024.

Ecological data that are within the public domain can be shared with the relevant Local Records Centre (LRC)

- 4.29 Ecological data arising from the Proposed Development can be shared with the Nottinghamshire Biological and Geological Records Centre.

The relevant date for the pre-development baseline values

- 4.30 As described above, and in Appendix 7.3: Habitat Baseline report, the baseline habitat surveys to date were carried out between January 2024 and July 2024. Further survey is anticipated for Autumn 2024, to include the river condition assessments. The July 2024 botanical surveys are considered to provide the most pertinent habitat information, and involved walkovers of much of the Site, including verification of any habitat changes observed – therefore, it is considered reasonable that the latest date of botanical survey has been selected as the formal relevant date of the assessment, which is 25 July 2024.

Irreplaceable habitats

- 4.31 No veteran or ancient trees were identified onsite as part of the April 2024 arboricultural survey classifications; however, based on the definition of irreplaceable habitats provided within the Biodiversity Gain Requirements (Irreplaceable Habitat) Regulations 2024, it is considered likely that some hedgerow trees may qualify as ‘veteran’ due to the presence of significant decay features, and therefore would be considered irreplaceable for the purpose of biodiversity gain assessment.
- 4.32 The trees that may host veteran features are within the hedgerow habitats. The Biodiversity Metric User Guide does not require trees in hedgerows to be recorded as individual trees unless they are ancient or veteran. As the exact prevalence of veteran trees has not yet been determined, this preliminary assessment has included an arbitrary hectareage of this habitat within the SBM calculator tool as individual trees and irreplaceable habitat that will be 100% retained, (see below). It is noted that the irreplaceable habitats do not generate biodiversity units in the SBM so the baseline value of the Site will not be affected. Further assessment will be undertaken in collaboration with arboricultural specialists to identify the extent of these irreplaceable habitats so that they can be more accurately reflected in the biodiversity metric.
- 4.33 It is anticipated that all mature trees, including trees that may be categorised as veteran, will be retained and protected during the construction phase of the Proposed Development, the Applicant intends to avoid the need to fell trees where possible. No other irreplaceable habitats have been identified onsite. Therefore, it is unlikely that irreplaceable habitat will be lost or require bespoke compensation.

Application of the biodiversity gain hierarchy

- 4.34 The biodiversity gain hierarchy requires that adverse effects to onsite habitat with a distinctiveness rating of four or more (medium to very high distinctiveness) are avoided, and where adverse effects cannot be avoided then the effects are mitigated (minimised). The adverse effects must then first be compensated via onsite enhancement, and where not feasible, be compensated via onsite habitat creation.
- 4.35 Only once all onsite options for biodiversity gain have been reasonably exhausted, then offsite biodiversity options may be used. It is not anticipated that offsite provisions are required for the Proposed Development.
- 4.36 Habitats of distinctiveness rating of less than four (very low to low distinctiveness) must also be compensated, which has been considered within this assessment, as all habitats are entered into the SBM which informs the biodiversity gain requirement.
- 4.37 Further details about how the biodiversity gain hierarchy has been considered from the design stage onwards will be provided at a later stage, once detailed design information has been made available. Whilst the regulations require the biodiversity gain hierarchy to be taken account of post-consent in

the preparation of the BGP for Planning Act development²⁰, information is typically being requested at an earlier stage than this by decision makers to inform the application submission.

Interaction between biodiversity gain hierarchy and NPPF mitigation hierarchy

- 4.38 A preliminary Ecological Impact Assessment is set out within Chapter 7 'Ecology and Biodiversity' of the PEIR and has assessed the potential ecological impacts of the Proposed Development and has set out avoidance, mitigation and compensation measures in line with the NPPF mitigation hierarchy. A further detailed assessment will be available in the subsequent ES. Both the NPPF mitigation hierarchy and biodiversity gain hierarchy start with avoidance of impact and progress onwards; the details of the hierarchical 'step by step' approach has been provided transparently; in effect, for the Proposed Development, following the biodiversity gain hierarchy means that the requirements of the NPPF hierarchy can also be met because high value habitats have been avoided and because sufficient mitigation and compensation measures can be put in place for habitats of medium distinctiveness or less to deliver at least 10% biodiversity gain. No habitats of high distinctiveness will be lost, and no habitats of very high distinctiveness are present on Site. This report has considered the potential interactions between ecological impact compensation, and biodiversity value compensation by excluding areas that may be enhanced for skylark mitigation from post-development calculations (i.e. assuming they will be retained as is, rather than subject to habitat creation or enhancement).

Significant on-site enhancements

- 4.39 The onsite works will create new habitats or enhance habitats to a distinctiveness score of four or more. There is also considered to be large scale habitat creation of the low distinctiveness habitat *modified grassland*. Taken together, these habitat measures are considered to be significant onsite enhancements according to Planning Practice Guidance²¹. This means that the habitat measures will be subject to a 30 year period of habitat management being secured.

Trading rules

- 4.40 Trading rules are anticipated to be satisfied subject to the assumptions made within this assessment (specifically including the retention of certain habitats such as woodland and orchard, that the proposed ditch and hedgerow enhancements can be delivered with the agreement of other stakeholders, and that sufficient quantity of arable field margin and grassland habitat will be created).

Habitat management and monitoring plan

- 4.41 A habitat management and monitoring plan (HMMP) will be prepared for the project in association with the legal agreement to deliver significant on-site habitat creation and existing habitats enhancement. The structure and template of the HMMP will be tailored to be proportionate to the habitat creation and enhancement measures and the Proposed Development.
- 4.42 The HMMP will specify measures required to allow the significant enhancements to be maintained to their desired target conditions. This will include detail on measures such as: enhancement/creation and ongoing management of hedgerows, management and monitoring of the habitats such as arable field margins and grasslands, and rotational management of ditches. As above, in this instance there will be reliance on other stakeholders to contribute to relevant habitat management practice specifically hedgerows and ditches.
- 4.43 The HMMP allows for periodic updates to the document and habitat management practice in recognition of habitats being dynamic and subject to change over time. The HMMP allows for regular ecological monitoring to be undertaken and for responsive management in relation to unexpected outcomes including failures and the provision of contingency measures to address the given issue.

²⁰ It is assumed that this biodiversity gain hierarchy consideration is the same for Development Consent Order (DCO) projects.

²¹ DLUHC [Department for Levelling Up, Housing and Communities] (2024) *Guidance Biodiversity net gain, Planning practice guidance, 14 February 2024* [online] Available at: <https://www.gov.uk/guidance/biodiversity-net-gain> Accessed 01 March 2024.

5 Consideration of assumptions and limitations

- 5.1 This assessment commenced prior to all relevant field surveys being completed for the Site – particularly for watercourse habitats. Professional judgement has been applied in allocating the provisional condition of habitats that have not yet been subject to detailed survey (which require the Modular River Physical [MoRPh] surveys), typically taking a precautionary approach alongside an accompanying rationale.
- 5.2 All biodiversity values provided in this report are preliminary and will be subject to change as a result of further survey and design information becoming available.
- 5.3 The following assumptions have been applied to the **baseline** assessment while surveys are ongoing and subject to the outcome of those surveys:
- a) The onsite lake is identified as ‘*High alkalinity lake*’ habitat in moderate condition. Moderate condition has been assumed until further survey is undertaken, as an intermediate value.
 - b) No *individual trees* within hedgerows will be removed, therefore individual trees are not recorded separately within the baseline value²².
 - c) Some hedgerows have been subject to a desk-based assessment, including review of data from the arboricultural surveys²³, to determine their habitat class and condition (refer to Appendix 7C: habitat baseline report for further information). The desk-based assessment has been subject to a ground-truthing exercise, in which all hedgerows identified in as having five or more species along their entire length (during the agricultural surveys) were subject to full hedgerow survey by and ecologist to confirm their habitat type and condition. This equated to survey of ca. 15 km of the ca. 68 km of hedgerows on Site. The remaining hedgerows were classed based on other sources of field observations²⁴. This allowed six of the ten condition criteria assessments to be based on observations recorded by the arboricultural consultants, and two further conditions were assessed based on observations made during the habitat surveys²⁵. The remaining two criteria assessments have been extrapolated from the ground-truthed data, which determined that hedgerows on Site generally pass condition C1 (on undisturbed ground) and C2 (on having <20% cover of species indicative of nutrient enrichment) – is has been assumed that all hedgerows that have not been ground-truthed pass these criteria. Small disparities in hedgerow lengths may be evident between the arboricultural survey report and this biodiversity assessment as a result of the varying definitions of hedgerows, lines of trees, etc. under the UK habitat classification, and whether the features are wholly within the Site boundary.
 - d) River habitats within 10 m of the current planning application (redline) boundary have been assigned moderate condition until detailed River Condition Assessment of watercourses is completed.
 - e) The West Burton Solar Project cable route intersects the Site. It is understood that the West Burton Solar Project will reinstate the current habitats following the cable installation (and the target habitat types and conditions will be equal to the current baseline). Therefore, the West Burton Solar Project will not result in a change to the baseline habitat assessment for the Proposed Development.
- 5.4 The following assumptions have been made about the **post-development** scenario to inform this assessment:
- a) Reliance has been made on the Indicative Parameters Plan drawing *04954-RES-LAY-DR-LE-018 rev1*, dated 11 July 2024, prepared by RES and provided in Appendix 1 of this report, to determine the extents of development areas. For the purpose of this assessment, this has been interpreted into the land use types shown on Figure 7.12.2 and discussed below.

²² In line with page 54 of the Metric User Guide: “*if any medium, large or very large trees within a hedgerow or ‘rural’ line of trees are being removed, record these in the area baseline as individual trees*”

²³ Barton Hyett Arboricultural Consultants (2024) *Arboricultural Survey Report, Steeple Renewables Project*, 22 May 2024.

²⁴ This included the hedgerow descriptions provided by Barton Hyett Arboricultural Consultants (2024), which included descriptors of gaps. Habitat data on the locations or wet and dry ditches, habitat data on the vegetation within 1m of hedgerows, and ecological data on the location of trees.

²⁵ These were condition D1 on the presence of invasive and neophyte species, and condition D2 on signs of physical damage.

- b) Where included, areas marked as 'Western Biodiversity Mitigation Area' and 'Eastern Biodiversity Mitigation Area' (Figure 7.12.2) have been assumed to be retained as they are for the purpose of this preliminary assessment. This is a precautionary approach to understand whether the Proposed Development may achieve a net gain if the biodiversity mitigation areas are used for other purposes such as species compensation/mitigation or greenspace. The outcomes of this preliminary assessment will also inform the design of the Biodiversity Mitigation areas (refer to point 'b') below).
- c) Certain areas of the 'Biodiversity Mitigation Areas' are required for Environmental Impact Assessment mitigation measures (such as compensatory habitat for skylark) rather than biodiversity gain, and any resulting increase in habitat value would not be considered to be additional, with reference to the rules shown in national Planning Practice Guidance²⁶. For this preliminary assessment, the areas proposed to be enhanced for skylark mitigation have not been included within the SBM outcomes to ensure that at least 10% gain can be achieved without counting these areas as enhancements (these areas are considered as retained only in the tool). However, the habitats in the Site may contribute to habitat trading summaries – as such, 1.5 ha will be changed to arable field margin in the Western Biodiversity Mitigation Area to allow for biodiversity unit trading rules to be met (further information is provided in section 4 above). If arable field margin creation is removed from the calculator tool, it reports that trading rules are not met, but that the percentage HaU gains in Table 7.12.1 are reduced by 0.13%-0.14% only (to give an overall outcome of +10.56% or +20.05% HaU gains respectively). As the outcome remains higher than +10%, the delivery of mandatory biodiversity gain percentage is still achieved even when the arable field margin creation is not counted.
- d) For the 'Proposed Solar (and BESS) Areas' as well as the southern of the two areas reserved as potential 'Site Access corridors' (Figure 7.12.2), it is assumed that:
- i. Ponds, orchards, woodlands, and other habitats of a medium distinctiveness or greater (score of four or more) will be retained within the Proposed Solar Areas (apart from other neutral grassland, for which 1 ha or 8.17 HaU is assumed to be lost, refer to point 'ii' below).
 - ii. Field margins (habitats that are 'other neutral grassland', 'and 'arable field margin – tussocky') will be mostly retained. It is assumed that 1.18 out of the 22.34 ha will be lost and replaced with *developed land; sealed surface* habitat to represent possible trackways, BESS or substations that may intersect the margin areas.
 - (a) As arable field margins habitat is associated with arable land – consideration has been given to whether this habitat type is wholly 'lost' if adjacent cropland is changed to grassland. However, the ecological function of the margins is not anticipated to change as a result of the adjacent field turning from cropland to modified grassland. Where required the long-term management of the margins can be altered to allow for sporadic cultivation or disturbance to emulate arable management. Therefore, it is considered that there will not be a loss in biodiversity value, and this habitat has been considered as 'retained' in the Biodiversity Metric calculations (except for the anticipated 5% losses where maintenance roads may be required highlighted above).
 - iii. Existing buildings, bare ground/unvegetated, unsealed surface will be retained.
 - iv. All other habitats (primarily cropland, modified grassland and ruderal/ephemeral habitat equating to a total of 610 ha) will be lost and replaced with the following:
 - Approximately 520 ha *modified grassland in a mix of poor and moderate condition* (representing lower-maintenance grassland under arrays, some of which may be used for pasture or regularly mown).
 - Approximately 6 ha of *developed land; sealed surface* (for tracks and substations and battery storage).
 - Approximately 30 ha *other neutral grassland in moderate condition* (representing field margins or buffers that may be managed for biodiversity).

²⁶ Defra (2024) *Guidance: What you can count towards a development's biodiversity net gain* [online] Available at: <https://www.gov.uk/guidance/what-you-can-count-towards-a-developments-biodiversity-net-gain-bng> accessed 28 May 2024.

- e) The northern area reserved as potential 'Site Access Corridor', shown on Figure 7.12.2, is on an existing surfaced access road that is assumed not to change i.e. it will be retained and shown in the metric as developed land; sealed surface habitat.
- f) For cable infrastructure areas (including the combined Biodiversity Mitigation and temporary cable infrastructure area), it is assumed:
 - i. That 10 % of each habitat will be lost (ca. 3 ha total area), and will be replaced with a habitat that is considered easy to create (low risk) and an average condition i.e. *modified grassland in moderate condition*. The habitats to be subject to 10% loss would be *arable field margin – tussocky, artificial unvegetated unsealed surface, bare ground, cereal crops, non-cereal crops, developed land; sealed surface, modified grassland, and other neutral grassland*. This loss will not apply to areas of scrub, trees and woodland in the cable infrastructure areas, which will be wholly retained.
- g) It is assumed at this stage that a total of no more than 550 m of hedgerow loss will occur as a result of the BESS construction and access roads.
- h) It is assumed that created hedgerows will be a 50:50 mix of the habitat classes: *Species-rich native hedgerow with trees - associated with bank or ditch* (a very high distinctiveness habitat) and *Species-rich native hedgerow* (medium distinctiveness habitat) in good condition.
- i) It is assumed that hedgerow enhancements would comprise enhancing *Native hedgerow* (low distinctiveness habitat) to *Native hedgerow with trees* (medium distinctiveness habitat), and the hedgerows would keep their original condition and strategic significance scores.
- j) It is assumed that no new ditches will be created in line with the requirements of the flood risk and drainage discussions held within the project design team²⁷ It is assumed that approximately 4.95 km of existing ditches that are in poor condition can be enhanced to moderate condition, with no overall change to encroachment by non-natural features. The ability to enhance the ditch habitat is only considered possible if eutrophication through surface water run-off from agricultural land is controlled (which is considered to be possible as a result of the change of land use from cropland to solar farm) and if plant species number and diversity can be increased. It is anticipated that plant diversity may be increased by managing the ditches on selective rotation in 10-20m sections, undertaking targeted cutting/thinning of scrub or dominant emergent vegetation, and possibly plug planting aquatic plant species at low densities. However, consultation with the Internal Drainage Board, Local Flood Authority and Environment Agency is underway to discuss the approach to ditch enhancements or ditch creation. It is assumed that any formal applications to the EA and/or IDB consenting regime can be made and approved to enable the habitat enhancement and management practice changes.
- k) It is assumed that any created or enhanced area-based habitats are considered to have no strategic significance value at this stage (see below regarding hedgerow habitats).

5.5 Given that the Nottinghamshire & Nottingham Local Nature Recovery Strategy is in preparation, to assess the potential strategic significance of the habitats, the draft LNRS mapping tool²⁸ and the draft Bassetlaw Local Plan 2020-2038 policies maps have been used to determine whether habitats on Site may have strategic significance. It has been determined that a corridor of trackside hedgerows form a 'Minor Green Corridor' in the draft plan (Policy ST39, refer to Bassetlaw District Council, 2022) and therefore these specific hedgerows have been assigned strategic significance (classed as 'formally identified in local strategy', which gives a multiplier of 1.15). It is anticipated that further habitats, such as those forming parts of Local Wildlife Sites, may be assessed as having strategic significance as the LNRS progresses.

²⁷ the project flood risk and drainage engineers/hydrologists (RSK Land & Development Engineering) and RES, discussions on 20 June 2024 and 07 August 2024

²⁸ Nottinghamshire & Nottingham Local Nature Recovery Strategy (2024) *The Local Habitat Map* [online] Available at: <https://www.nottinghamshire.gov.uk/planning-and-environment/local-nature-recovery-strategy-for-nottinghamshire/local-habitat-map> Accessed 01 November 2024.

6 Figures

[overleaf]

Figure 7.12.1: Preliminary Baseline Habitat Plan

Figure 7.12.2: Indicative Land Use Areas

Figure 7.12.3: Indicative Hedgerow Enhancement Scenario

Figure 7.12.4: Indicative Watercourse Enhancement Scenario