BEANE SOLAR FARM

Biodiversity Net Gain Assessment

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Beane Solar Farm: BNG Assessment
Final
November 2024

rpsgroup.com

Document status

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Prepared for:

Renewable Energy Systems Group Ltd.

Prepared by:

RPS

20 Western Avenue
Milton Park
Abingdon, Oxfordshire OX14 4SH

Contents

Figures

Appendices

1 INTRODUCTION

1.1 Purpose and Scope of this Report

1.1.1 RPS was commissioned by Renewable Energy Systems (RES) Group Ltd (the Applicant) to produce a Biodiversity Net Gain (BNG) Assessment in support of a planning application for the development of a 49.9 MW ground-mounted solar farm on land at Lodge Farm, Cottered, Buntingford, SG9 9PU (the site).

1.1.2 A Phase 1 Habitat Survey was undertaken by RPS on the 30th of May 2023. This survey provided the ecological baseline necessary to undertake a BNG Assessment of the site.

1.1.3 This BNG assessment report aims to:

- Calculate and assess the baseline ecological status and condition of current habitats identified on site;
- Calculate the biodiversity value of the site post-development; and
- Provide a summary of the habitat enhancements and creation proposals designed to ensure net gain is achieved.

1.1.4 The recommendations included within this report are the professional opinion of an experienced ecologist and therefore the view of RPS.

1.2 Biodiversity Net Gain Definition and Methods

1.2.1 BNG is defined in Baker *et al* (2019) as:

> *"Development that leaves biodiversity in a better state than before".*

1.2.2 In England, BNG for a development must meet a percentage increase of at least 10%. This is mandatory under Schedule 7A of the Town and Country Planning Act 1990 (as inserted by Schedule 14 of the Environment Act 2021).

1.2.3 The National Planning Policy Framework (NPPF, 2021), states in Para. 174 that:

> *"Planning policies and decisions should contribute to and enhance the natural and local environment by … minimising impacts on and providing net gains for biodiversity."*

1.2.4 An accepted method of assessing BNG is through the use of biodiversity calculators to assess the biodiversity value of habitats pre- and post-development based on habitat type, distinctiveness and condition.

1.2.5 Distinctiveness is defined in The Statutory Biodiversity User Guide (DEFRA, 2024);

"A measure based on the type of habitat and its distinguishing features. This includes:

- *consideration of species richness and rarity;*
- *the extent to which the habitat is protected by designations;*
- *the degree to which a habitat supports species rarely found in other habitats."*

1.2.6 A biodiversity index is derived for the baseline and for the proposed development, and BNG is considered to be achieved where an increase in value is delivered (on or offsite), and where habitats of a higher value are not replaced exclusively with habitats of a lower value.

1.2.7 Since February 2024, a Statutory BNG Metric Calculator has been provided by DEFRA for calculating net gain. The methods of calculating BNG for this project uses this tool for the assessment in this report. The tool and associated documents were downloaded from:

Statutory biodiversity metric tools and guides - GOV.UK (www.gov.uk)

Condition Assessment

1.2.8 Using the data collected from the Phase 1 Habitat Survey, a habitat condition assessment was undertaken for the habitats present within the project boundary. The appropriate 'condition sheet' was first selected via the Table TS1-1a in the technical supplement provided by Pank *et al.* (2022).

1.2.9 The condition sheet was then used to assess the individual habitats by comparing how they scored against pre-set condition assessment criteria. The criteria describe what components are needed for the habitat to be of good, moderate, or poor value.

1.2.10 Each habitat was scored the following:

- 1 – Poor;
- 2 – Moderate; and
- 3 – Good.

1.2.11 Habitat condition is defined in The Statutory Biodiversity User Guide (DEFRA, 2024);

"Habitat condition is a measure of the state of a habitat and is used to measure variation between parcels of the same habitat type"

1.2.12 The calculator allows these to be further divided and provides categories for fairly good and fairly poor. The ecologist undertaking the assessment used their professional judgement, considering the habitat condition assessment criteria, to decide when it was suitable to use these categories.

1.2.13 It should be noted that some habitats are given a fixed score and do not need assessing.

Trees

1.2.14 In the Statutory Biodiversity Metric Calculator under 'Individual trees – Rural' only trees that are proposed for removal within the landscape proposals (RPS, 2024) have been included. These include trees present within hedgerows. Retained trees within hedgerows are included under the 'species-rich native hedgerows with trees' habitat.

1.2.15 Habitat area for 'Individual Trees' was calculated using the 'Tree Helper' tool provided within the Statutory Biodiversity Metric Calculator.

River Beane

1.2.16 If a river is within the redline boundary of a development site it is a requirement that a 10% biodiversity net gain is achieved for this habitat. The dry section of the River Beane through the site has not been included as a river in the BNG metric, but as a dry ditch. The reasons for this is discussed below:

1.2.17 The River Beane is classified as priority river habitat (Natural England, 2014). Rivers qualify as priority habitat either because they are considered to be near-natural, or because they fulfil one or more of the criteria relating to that particular habitat types. The section of the River Beane located on site is not considered a Priority River Habitat as it does not meet any one or more of the following criteria: -

- A riverine water body of high hydromorphological/ecological status;
- A headwater;
- Occurs within of the EC Habitat Directive Annex I habitat (H3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation);
- An active shingle river.;
- Area or Site of Special Scientific Interest;
- Contains species that are Annex II Habitats Directive species, BAP Priority species, or Invertebrate species which are strongly indicative of river shingle.

1.2.18 The methodology to complete BNG for a watercourse at a site is a River Condition Assessment that includes a MoRPH survey. The MoRPH survey is a hydromorphological assessment – as no water is present this survey cannot be completed (Modular River Survey, 2022). Therefore, the baseline value of a river habitat is not measurable.

1.2.19 A watercourse is defined as a “channel of running water” (UKHABS, 2023), the section of the ‘River Beane’ on site cannot also be categorised as such as no running water is present, and it has been dry for a considerable amount of time.

1.2.20 Therefore, the section of the River Beane on site is not considered a river for the purposes of BNG and cannot be assessed using the standard river condition methodology.

1.2.21 For the purposes of this BNG assessment the baseline and post development value of the dry section of the River Beane on site has been assessed as ‘Ditches’ ‘poor condition’.

2 BASELINE DESCRIPTION

2.1.1 The baseline description is taken from the Ecological Appraisal (RPS, 2024) where the full Habitat Survey descriptions can be found.

2.2 Phase 1 Habitat Survey – Overview

2.2.1 A full list of the habitats identified on the site is shown on Figure 2.1 and provided below:

- A2.1 Dense Scrub;
- A2.2 Scattered Scrub;
- A3.1 Scattered Broadleaved Trees;
- B4 Improved Grassland;
- C3.1 Tall Ruderal;
- J1.1 Arable;
- J2.1.1 Intact Species-rich Hedgerow;
- J2.3.1 Intact Species-rich Hedgerow with Trees;
- J2.2.1 Defunct Species-rich Hedgerow with Trees;
- J4 Bare Ground;
- Road;
- J2.6 Dry Ditch;
- G1 Standing Water.

A2.1 Dense Scrub;

2.2.2 An area of dense scrub measuring approximately 10 m by 5 m was present in the centre of Field 2 (F2), between a strip of grassland and an arable field. The scrub predominantly comprised dog rose *Rosa canina* and bramble *Rubys fruticosus* with some common nettle *Urtica dioica*.

2.2.3 A small area of dense scrub with semi-mature trees was present in the southwestern corner of Field 1 (F1). Species present included ash *Fraxinus excelsior*, English oak *Quercus robur*, and hawthorn *Crataegus monogyna*.

2.2.4 A strip of mature, dense, scrub with scattered mature trees lay adjacent to the farm. Species included mature ash, field maple *Acer campestre* and hawthorn, with elder *Sambucus nigra*, bramble, hazel *Corylus avellana* and dog rose scrub.

2.2.5 Following the Natural England condition assessment for 'Heathland and shrub – Mixed Shrub' this would be categorised as being of a 'moderate' habitat condition.

2.2.6 The area of moderate condition mixed scrub is 0.29209 ha which is equivalent of 3.51 habitat units.

A2.2 Scattered Scrub;

2.2.7 Scattered scrub was recorded in areas adjacent to the Site boundaries. This comprised hawthorn, elder, rose, bramble and blackthorn Prunus spinosa. Occasional ruderal species including rosebay willowherb Chamaenerion angustifolium, common nettle, lesser burdock Arctium minus and cow parsley Anthriscus sylvestris were scattered throughout.

2.2.8 The scattered scrub surrounding Fields 4 (F4) and 5 (F5) also contained bracken Pteridium aquilinum.

2.2.9 Following the Natural England condition assessment for 'Heathland and shrub – Mixed Shrub' this would be categorised as being of a 'moderate' habitat condition.

2.2.10 The area of moderate condition mixed scrub is 0.27018 ha which is equivalent to 3.24 habitat units.

A3.1 Scattered Broadleaved Trees

2.2.11 Four oak trees were present along the westeren boundary of Field 5 (F5).

2.2.12 For the purposes of the metric, only one of these trees has been included in 'Individual trees – Rural' as referenced in paragraph 1.2.13.

2.2.13 Following the Natural England condition assessment for 'Individual trees – Rural Tree' this would be categorised as being of a 'good' habitat condition.

2.2.14 The Natural England condition assessment uses different criteria to classify what is considered 'good' compared to the British Standard classification of trees in relation to construction and under the Natural England condition assessment this is considered of 'good' habitat condition.

2.2.15 The Tree Helper Calculator (Table 2.1) below is provided within the biodiversity metric and is used to calculate the total habitat area for individual trees.

2.2.16 The area of Good condition individual trees is 0.0163 ha which is the equivalent to 0.20 habitat units.

Table 2.1 Tree Helper Calculator

Tree helper						
Tree size	Number of trees and area (ha) for each condition state					
	Poor	Area	Moderate	Area	Good	Area
Small		0.0000		0.0000		0.0000
Medium		0.0000		0.0000	1	0.0163
Large		0.0000		0.0000		0.0000
Very large		0.0000		0.0000		0.0000
Total	0	0.0000	0	0.0000	1	0.0163

B4 Improved Grassland

2.2.17 Areas of improved grassland were recorded in the western sections of Fields 5 (F5) and 6 (F6), approximately 1.3 and 1.5 ha. This grassland was almost entirely dominated by black grass *Alopecurus myosuroides*.

2.2.18 Intensively managed grassland margins were recorded across the Site. Species included slender meadow foxtail *Alopecurus pratensis*, perennial rye-grass *Lolium perenne*, cocks-foot *Dactylis glomerata,* common nettle, broad-leaved dock *Rumex obtusifolius,* spear thistle *Cirsium vulgare*, dandelion *taraxacum officinale agg.,* common daisy *Bellis perennis* and cow parsley.

2.2.19 These margins ranged in width between 1 m and 5 m, surrounding all field boundaries and running adjacent to both sides of the wet and dry ditches. The southern grassland boundary of Field 2 (F2) widened to approximately 100 m, on the eastern side from the pond.

2.2.20 A 25 m wide strip of grassland, formerly an old runway strip for the disused Cottered Airfield, dissected the centre of Field 2 (F2). A small area of dense scrub was located between the grassland and arable fields.

2.2.21 Following the Natural England condition assessment for 'Grassland – Modified Grassland' this would be categorised as being of a 'poor' habitat conditon.

2.2.22 The area of Poor condition modified grassland is 8.24019 ha which is the equivalent to 16.48 habitat units.

C3.1 Tall Ruderal

2.2.23 Tall ruderal vegetation was recorded across the raised earth mounds bordering the western and southern sides of the farm buildings. Species included cow parsley, common nettle, and broad-leaved dock; a small amount of grass species, including, cock's-foot and slender black grass, were interspersed throughout these mounds.

2.2.24 Ruderal vegetation of a similar composition to that described above ran adjacent to the wet ditch adjacent to the southern boundary of F2, the western boundaries of Field 3 (F3) and the north-eastern boundary of Field 4 (F4). The boundary in Field 4 (F4) also contained bracken.

2.2.25 Following the Natural England condition assessment for 'Sparsely vegetated land – Ruderal/Ephermeral' this would be categorised as being of a 'good' habitat condition.

2.2.26 The area of Good condition Ruderal/ Ephemeral is 0.59292 ha which is equivalent to 3.56 habitat units.

J1.1 Arable

2.2.27 The majority of the site comprised maize *Zea* sp. fields.

2.2.28 For the purposes of the metric, habitat area was included under 'Cropland – Cereal Crops'.

2.2.29 The area of cereal crop is 69.71144 ha which is equivalent to 139.42 habitat units.

J4 Bare ground

2.2.30 Farm tracks are present on a small area of the site.

2.2.31 For the purposes of the metric, habitat area was included as part of 'Urban – Artificial unvegetated, unsealed surface'.

2.2.32 The area of 'artificial unvegetated, unsealed surface' is 0.00790 ha which is equivalent to 0.00 habitat units.

Road

2.2.33 A small area of the site includes a road.

2.2.34 For the purposes of the metric, habitat area was included as part of 'Urban – Developed Land, Sealed Surface'.

2.2.35 The area of 'Developed Land, Sealed Surface' is 0.07179 ha which is equivalent to 0.00 habitat units.

J2.1.1 Intact Species-rich hedgerow

2.2.36 A flailed, 2 m x 2 m species-rich hedgerow was recorded on the eastern boundary of the site adjacent to the neutral semi-improved grassland discussed in paragraph 5.2.13. This comprised holly *Ilex aquifolium,* hawthorn, blackthorn, dog rose and elder, with common nettle, bramble, and ivy *Hedera helix*. This hedgerow extended down to the ground level with modified grassland adjacent to it.

2.2.37 Following the Natural England condition assessment for 'Species-rich native hedgerow' this would be categorised as 'good' condition.

2.2.38 The area of Good condition species-rich native hedgerow is 0.232231 km which is equivalent to 2.79 hedgerow units.

J2.3.1 Intact Species-rich native hedgerow with Trees

2.2.39 Sections of unmanaged species-rich hedgerow, ranging between 2 m and 5 m high and 2 m and 3 m wide were present across the site. These hedgerows typically comprised hawthorn, blackthorn, elder, dog rose, field maple, spindle *Euonymus europaeus*, ivy and holly. Mature oak, ash, sycamore, and willow *Salix sp*. trees were recorded throughout the species-rich hedgerows.

2.2.40 The ground flora of these hedgerows comprised broadleaved dock, common nettle, cow parsley and bramble.

2.2.41 Following the Natural England condition assessment for 'Species-rich native hedgerow with trees' this would be categorised as 'moderate' condition.

2.2.42 The area of moderate condition species-rich native hedgerow with trees is 1.21628 km which is equivalent to 14.60 hedgerow units.

J2.2.1 Defunct Species-rich Hedgerow with Trees

2.2.43 A section of the species-rich hedgerow with trees was recorded as defunct due to the presence of many large gaps of varying distances between sections.

2.2.44 Following the Natural England condition assessment for 'Species-rich native hedgerow with trees' this would be categorised as 'moderate' condition.

2.2.45 The area of Moderate condition species-rich native hedgerow with trees is 0.29365 km which is equivalent to 3.52 hedgerow units.

J2.6 Dry Ditch

2.2.46 A section of the River Beane runs between Fields 1 and 2 and was dry at the time of the survey. Over-abstraction has meant that the main source of the River Beane is now the Stevenage Brook. Above this tributary, the river is often dry. This, along with impoundment structures and sediment from agricultural run-off is causing the river to dry.

2.2.47 It ranged in depth between 0.75 m and 1.5 m with no aquatic vegetation and steep-sided banks which are heavily vegetated with species including hogweed *Heracleum sphondylium*, common nettle, cock's foot, and perennial ryegrass.

2.2.48 For the purposes of this BNG assessment the baseline and post development value of the dry section of the River Beane on site is assessed as 'Ditches' 'poor condition'.

2.2.49 The length of the poor condition ditch is 0.70413 and provides 2.82 watercourse units.

G1 Standing Water

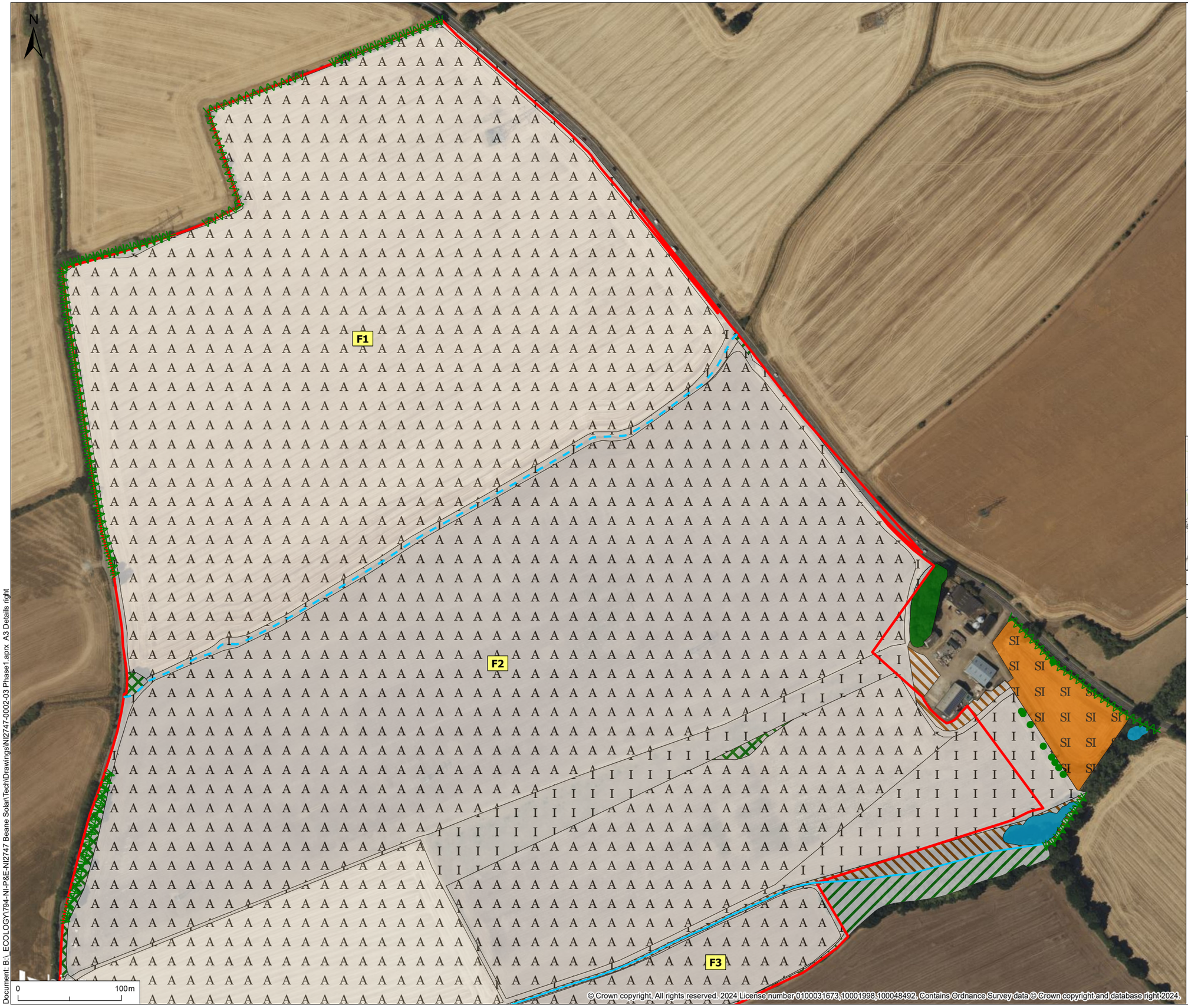
2.2.50 A wet ditch was present across the centre of the Site. The ditch was approximately 2 m in depth with steep-sided banks. There was no aquatic vegetation present; common nettle and rosebay willowherb were the dominant species recorded in the bankside vegetation.

2.2.51 The definition of a wet ditch is:

"*Artificially created linear water-conveyancing features which are less than 5m wide and are likely to retain water for more than 4 months of the year*." (Biodiversity Statutory User Guide DEFRA, 2024).

2.2.52 The length of the ditch is 0.79689 km and is of moderate condition and provides 6.38 watercourse units.

Figure 2.1: Phase 1 Habitat Plan



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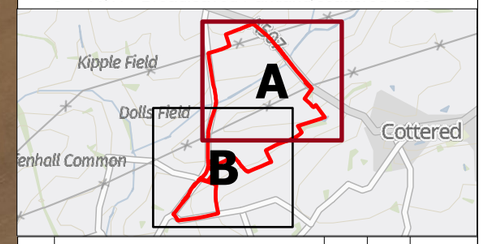
Legend

- Site Boundary

Phase1 Habitat Classification:

- A1.1.1 - Broadleaved woodland - semi-natural
- A1.1.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B2.2 - Neutral grassland - semi-improved
- B4 - Improved grassland
- C3.1 - Other tall herb and fern - ruderal
- G1 - Standing water
- J1.1 - Cultivated/disturbed land - arable
- J4 - Bare ground
- Road
- G2 - Running water
- J2.1.1 - Intact hedge - native species-rich
- J2.2.1 - Defunct hedge - native species-rich
- J2.3.1 - Hedge with trees - native species-rich
- J2.6 - Dry ditch
- A3.1 - Broadleaved Parkland/scattered trees



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MAKING COMPLEX EASY
A TETRA TECH COMPANY
20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
T: +44(0)1235 821 888 E: rpsox@rpsgroup.com

Client: Renewable Energy Systems Ltd

Project: Beane Solar Farm

Title: Phase 1 Habitat Map

Status	Drawn By	PM/Checked By
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Project Number	**Scale @ A3**	**Date Created**
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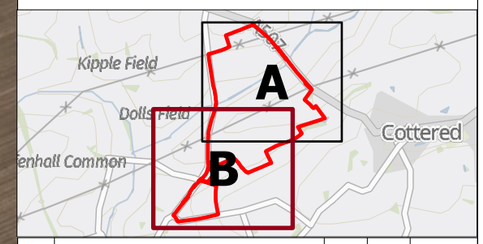
Legend

- Site Boundary

Phase1 Habitat Classification:

- A2.1 - Scrub - dense/continuous
- A2.2 - Scrub - scattered
- B4 - Improved grassland
- C3.1 - Other tall herb and fern - ruderal
- J1.1 - Cultivated/disturbed land - arable
- J4 - Bare ground
- Road
- G2 - Running water
- J2.3.1 - Hedge with trees - native species-rich
- A3.1 - Broadleaved Parkland/scattered trees



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MAKING COMPLEX EASY
A TETRA TECH COMPANY
20 Western Avenue, Milton Park, Abingdon, Oxfordshire, OX14 4SH
T: +44(0)1235 821 888 E: rpsox@rpsgroup.com

Client: Renewable Energy Systems Ltd

Project: Beane Solar

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3 BIODIVERSITY ENHANCEMENT STRATEGY

3.1 Habitats

3.1.1 Habitats on the proposed development site are taken from the current Landscape Proposals (RPS, 2024)

Developed land, sealed surface

3.1.2 In total 1.04772 ha of 'Developed land; sealed surface' has been included in the proposed development site. This would deliver **0.00 habitat units**.

Artificial unvegetated, unsealed surface

3.1.3 In total 1.45318 ha of 'Artificial unvegetated, unsealed surface' has been included in the proposed development site. This would deliver **0.00 habitat units**.

Modified grassland

3.1.4 An area of grazing grassland will be provided on site.

3.1.5 This habitat is of low distinctiveness. In total 60.66071 ha of moderate condition 'Modified grassland' will be provided. This would deliver **210.42 habitat units.**

Other neutral grassland

3.1.6 An area of wildflower grassland will be planted on site with a wildflower grassland seed mix. This will provide Medium disctinctiveness habitat at a Moderate condition. The area of 'Other neutral grassland' provided will be 11.66140 ha which is the equivalent to **98.00 habitat units.**

Woodland Planting; Mixed

3.1.7 Woodland will be planted onsite; it has been assumed that a "Poor" condition will be achieved for the purposes of the BNG assessment.

3.1.1 A total of 0.89170 ha will be provided onsite. This habitat will deliver **2.98 habitat units.**

Rural Trees

3.1.2 250 trees will be planted onsite. A total of 1.01788 ha will be provided. This habitat is of Medium distinctiveness and will form poor condition habitat. It will deliver **2.85 habitat units**.

Table 3.1 Tree Helper Calculator

Tree helper						
Tree size	Number of trees and area (ha) for each condition state					
	Poor	Area	Moderate	Area	Good	Area
Small	250	1.0179		0.0000		0.0000
Medium		0.0000		0.0000		0.0000
Large		0.0000		0.0000		0.0000
Very large		0.0000		0.0000		0.0000
Total	250	1.0179	0	0.0000	0	0.0000

Scrub Planting

3.1.3 A 0.25 ha area of mixed scrub will be planting on site; it has been assumed that a 'moderate' condition will be achieved for the purposes of the BNG assessment. This habitat will deliver **1.67 habitat units.**

New Hedgerow Planting – Species-rich native hedgerow

3.1.4 New hedgerow will be planted onsite which will be trimmed at 3.5 m in height. A total of 4.54516 km will be provided. This habitat is of Medium distinctiveness and will form Good condition species-rich native hedgerow. It will deliver **35.57 hedgerow units**.

Hedgerow Enhancement

3.1.5 A 0.29365 km length of the moderate condition species-rich native hedgerow with trees will be enhanced to produce good condition species-rich native hedgerow with trees. This will deliver **5.05 hedgerow units.**

3.1.6 A 1.21628 km length of the moderate condition species-rich native hedgerow with trees will be enhanced to produce good condition species-rich native hedgerow with trees. This will deliver **8.61 hedgerow units.**

River Beane

3.1.7 The dry section of the River Beane along the site boundaries will be retained and protected from adverse impacts with a stand-off of 10m.

3.1.8 Even though the watercourse metric cannot be used to demonstrate enhancement of this section of the River Beane through the site, as it is considered a dry ditch and the enhancement is not measurable for that ditch the following is being provided:-

- No development is happening within the riparian zone.
- The site was previously intensively farmed for arable crops. As part of the solar farm development this section of the site retained and the 'river banks' and surrounds will be planted with wildflower grassland

Ditch Enhancement

3.1.9 A 0.27 km length of the moderate condition ditch will be enhanced to produce good condition ditch.

3.1.10 Enhancement will include introduction of marginal aquatic plant species and as well as emergent, submerged and floating-leaved aquatic plant species to improve watercourse condition.

3.1.11 This will deliver **0.94 watercourse units**.

4 SUMMARY

4.1.1 The assessment above indicates that the development proposals will deliver a net gain of **98.40%** for habitats ,**189.90%** for hedgerows and **10.19%** for watercourses.

4.1.2 The total habitat units post-development delivered by the proposals is **325.69** units which is **161.53** units more than the baseline of **164.15** units.

4.1.3 The total hedgerow units post-development delivered by the proposals is **60.61** units which is **39.70** units more than the baseline of **20.91** units.

4.1.4 The total watercourse units post-development delivered by the proposals is **10.13** which is **0.94** units more than the baseline of **9.19** units.

4.1.5 A summary screenshot from the calculator tool is provided in Figure 4.1 below. The Statutory Metric Worksheet and Condition Assessment sheets for this project are provided as Appendices.

Figure 4.1: Statutory Metric Calculation Tool Headline Results

On-site baseline	*Habitat units*	164.15	
	Hedgerow units	20.91	
	Watercourse units	9.19	
On-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	325.69	
	Hedgerow units	60.61	
	Watercourse units	10.13	
On-site net change (units & percentage)	*Habitat units*	161.53	98.40%
	Hedgerow units	39.70	189.90%
	Watercourse units	0.94	10.19%
Off-site baseline	*Habitat units*	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site post-intervention (Including habitat retention, creation & enhancement)	*Habitat units*	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
Off-site net change (units & percentage)	*Habitat units*	0.00	0.00%
	Hedgerow units	0.00	0.00%
	Watercourse units	0.00	0.00%
Combined net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	161.53	
	Hedgerow units	39.70	
	Watercourse units	0.94	
Spatial risk multiplier (SRM) deductions	*Habitat units*	0.00	
	Hedgerow units	0.00	
	Watercourse units	0.00	
FINAL RESULTS			
Total net unit change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	161.53	
	Hedgerow units	39.70	
	Watercourse units	0.94	
Total net % change (Including all on-site & off-site habitat retention, creation & enhancement)	*Habitat units*	98.40%	
	Hedgerow units	189.90%	
	Watercourse units	10.19%	
Trading rules satisfied?	Yes ✓		

5 REFERENCES

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Appendix 1

Statutory Biodiversity Metric Tool for Beane Solar Farm

Appendix 2

Habitat Condition Assessment Sheets