



The Sirius Group

Solar Farm, Kelham, Newark

ECOLOGICAL APPRAISAL

September 2023

FPCR Environment and Design Ltd

Registered Office: Lockington Hall, Lockington, Derby DE74 2RH

Company No. 07128076. [T] 01509 672772 [E] mail@fpcr.co.uk [W] www.fpcr.co.uk

This report is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without the written consent of FPCR Environment and Design Ltd.

Rev	Issue Status	Prepared / Date	Approved / Date
-	Draft	RCO / 16.05.22	RJS / 20.05.22
A	Final	RCO / 28.08.23	RJS / 11.09.23
B	Final	RCO / 10.10.23	

CONTENTS

1.0	INTRODUCTION	2
2.0	METHODOLOGY.....	3
3.0	RESULTS.....	8
4.0	DISCUSSION AND RECOMMENDATIONS	17

TABLES

Table 1: HSI scores as a Measure of Pond Suitability

Table 2: Great crested newt survey dates and weather conditions 2020

Table 3: Great crested newt survey dates and weather conditions 2022

Table 4: Non-Statutory Sites adjacent to the Site Boundary

Table 5: Trees with Bat Potential Summary

Table 6: On-site Pond Descriptions and HSI Scores

Table 7: Summary of 2020 GCN Aquatic Survey Results

Table 8: Summary of 2022 GCN Aquatic Survey Results

FIGURES

Figure 1: Site Location and Consultation Results Plan – Designated Sites

Figure 2: Site Location and Consultation Results Plan – Species Records

Figure 3: Phase 1 Habitat Plan

Figure 4: Pond Location Plan

**APPENDICES**

Appendix A: Species List

Appendix B: Hedgerow Results Table

1.0 INTRODUCTION

1.1 This Ecological Appraisal has been prepared by FPCR Environment and Design Ltd. on behalf of Sirius Planning and provides details of an initial ecological assessment undertaken at land located within Kelham, Newark hereafter referred to as the site (central OS Grid Reference: SK767559).

1.2 The objective of the ecology survey was to gain an understanding of the baseline ecology of the site and immediate surrounding area and to determine whether there was potential for the site to support protected species. This investigation involved a desk study, extended Phase 1 habitat survey, great crested newt *Triturus cristatus* (GCN) presence absence surveys and ground level assessment of trees for potential to support roosting bats. Following the initial survey undertaken in April 2020 an updated walkover was carried out in October 2021 and April 2023 with GCN surveys undertaken in 2020 and 2022.

Site Context

1.3 The site is located to the west of Newark comprising a mix of large arable fields surrounded by woodlands and scrub. Areas of additional habitat associated with the boundaries include tall ruderal vegetation, scrub and mature trees.

1.4 Land in the surrounding area is predominantly occupied by grassland fields of pasture, bound by hedgerows and woodland blocks, with residential areas associated with Newark to the east.

Development Proposals

1.5 Proposals within the survey boundary are for a solar farm and battery energy storage system with associated access roads.

Study Objectives

1.6 FPCR were commissioned to undertake an Ecological Appraisal of the site in order to identify habitats or species that may be affected by the proposals. The objectives of the study were to:

- a) Identify the existing on-site habitats;
- b) Check for evidence of, or potential for, protected species;
- c) Identify potential ecological impacts relating to the development proposals;
- d) Identify requirements for further survey; and
- e) Propose mitigation measures to avoid or reduce ecological impacts as necessary.

2.0 METHODOLOGY

Desk Study

- 2.1 To support the field survey and further compile existing baseline information relevant to the site, ecological information was sought in 2020 from third parties, including records of protected or notable species and sites designated for nature conservation interest.
- 2.2 The Multi Agency Geographic information for the Countryside (MAGIC) website¹ was reviewed for the presence of any statutory designated sites of international (Special Conservation Area (SAC), Special Protection Areas (SPA) or Ramsar Sites), national (Sites of Special Scientific Interest (SSSI) or National Nature Reserves (NNR)) or local conservation importance (Local Nature Reserve (LNR)) within 5km, 2km and 1km of the site, respectively.
- 2.3 Consultation was also undertaken with the Nottinghamshire Biological and Geological Records Centre (NBGRC) for the presence of non-statutory designated sites of nature conservation importance (Local Wildlife Sites (LWS)) and protected/notable species records within 1km of the survey site.
- 2.4 Further inspection, using colour 1:25,000 OS base maps and aerial photographs from Bing (<http://www.bing.com/maps>) has also been undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.

Extended Phase I Habitat Survey

- 2.5 An Extended Phase I Habitat Survey was initially undertaken on 22nd April 2020 , this was updated 27th October 2021 and most recently 20th April 2023. This involved classification of the broad habitat types present using the system published by the UK Joint Nature Conservation Committee², but where considered appropriate, with additional information collected beyond that required to determine the Phase 1 Habitat type. The survey was also extended to assess the suitability of the habitats and other features to support protected and notable fauna species.
- 2.6 This involved a systematic walkover of the site by an experienced ecologist to classify the broad habitat types and to identify any Habitats of Principal Importance (HPI) for the conservation of biodiversity in England as listed within Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. Target notes were made where necessary to record features or habitats of particular interest. Botanical species lists were compiled during the walkover survey, which although not exhaustive, were considered sufficient to determine broad habitat types and their relative ecological value.

Hedgerows

- 2.7 As part of the assessment, hedgerows were surveyed using the Hedgerow Evaluation and Grading System (HEGS)³. This method of assessment includes noting down canopy species composition, associated ground flora and climbers, structure of the hedgerow including height, width and gaps,

¹ <https://magic.defra.gov.uk>

² Joint Nature Conservation Committee (JNCC) (2010). Handbook for Phase 1 habitat survey - A technique for environmental audit

³ Clements, D.K., & Tofts, R.J.(1992). Hedgerow Evaluation and Grading System (HEGS): A methodology for the ecological survey, evaluation and grading of hedgerows. Countryside Planning and Management

associated features including number and species of mature trees, banks, ditches and grass verges.

- 2.8 Each hedgerow is given a grade using HEGS with the suffixes '+' and '-', representing the upper and lower limits of each grade respectively. These grades represent a continuum on a scale from 1+ (the highest score and denoting hedges of the greatest nature conservation priority) to 4- (representing the lowest score and hedges of the least nature conservation priority) as follows:

Grade 1 – High to very high value

Grade 2 – Moderately high to high value

Grade 3 – Moderate value

Grade 4 – Low value

- 2.9 Hedgerows graded 1 or 2 are considered to be a priority for nature conservation.

- 2.10 Hedgerow were also assessed against the Wildlife and Landscape criteria contained within Statutory Instrument No: 1160 – The Hedgerow Regulations 1997 to determine whether they qualified as 'Important Hedgerows' under the Regulations. This was achieved using a methodology in accordance with both the Regulations and DEFRA guidance⁴.

Field Survey – Fauna

- 2.11 During the Extended Phase I survey, observations, identification, and signs of any species protected under the following list of Acts, Regulations or initiatives were noted:

Part 1 of the Wildlife and Countryside Act 1981 (as amended)⁵

The Protection of Badgers Act 1992⁶

The Conservation of Habitats and Species Regulations 2017 (as amended)⁷

The NERC Act – S41 Species of Principal Importance for the conservation of biodiversity

Amphibians

Habitat Suitability Index (HSI) Assessment

- 2.12 The on-site ponds were assessed for their suitability to support great crested newts using the Habitat Suitability Index (HSI) assessment methodology⁸.
- 2.13 The HSI assessment provides an objective method for assessing the suitability of a pond for great crested newt. The system provides an index between 0 and 1, with 0 indicating unsuitable habitat and 1 optimal habitat. Ten indices, including pond area, permanence, presence of fish and

⁴ DEFRA. (1997). The Hedgerow Regulations 1997. A Guide to the Law and Good Practice. London: HMSO

⁵The Wildlife and Countryside Act 1981 (as amended). [Online]. London: HMSO Available at <http://www.legislation.gov.uk/ukpga/1981/69>

⁶The Protection of Badgers Act 1992 (as amended). [Online]. London: HMSO Available at: <http://www.legislation.gov.uk/ukpga/1992/51/contents>

⁷The Conservation of Habitats and Species Regulations 2017 [Online]. London: HMSO. Available at: <http://www.legislation.gov.uk/uksi/2017/1012/contents/made>.

⁸ Oldham, R.S., Keeble, J. Swan, M. J. S & Jeffcote, M. (2000) Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*), Herpetological Journal 10(4), 143-155.

percentage cover of macrophytes, each representing a factor considered to affect great crested newts are used to calculate the index score.

- 2.14 A score is assigned according to the most appropriate criteria level set within each attribute and a total score calculated of between 0 and 1. Pond suitability is then determined according to the scales shown in Table 1.

Table 1: HSI scores as a Measure of Pond Suitability

HSI	Pond Suitability
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

- 2.15 In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores.

Presence/Absence Surveys

- 2.16 Those ponds identified as being suitable to support GCN were surveyed following the methods set out in the Natural England (formerly English Nature) guidelines⁹. These guidelines state that, to determine presence/absence within ponds, four survey visits using three methods per visit, including torch survey, bottle-trapping, terrestrial searches and egg searching, should be used. Surveys should be undertaken between mid-March and mid-June, with at least two survey visits during mid-April to mid-May. Where GCN were confirmed as present a further two surveys were undertaken, in order to undertake a population size class assessment.
- 2.17 Table 2 and 3 below details the survey dates, and weather conditions during each survey visit.

Table 2: Great crested newt survey dates and weather conditions 2020

Survey Date	Air Temperature (°C)		Weather Conditions
	PM	AM	
05/05/20	12	12	Clear, light breeze, no rain
12/05/20	11	10	Clear, light breeze, no rain
14/05/20	14	12	Clear, no wind, no rain
18/05/20	16	15	Clear, moderate breeze, no rain

⁹ English Nature (2001) Great Crested Newt Mitigation Guidelines, English Nature, Peterborough

Table 3: Great crested newt survey dates and weather conditions 2022

Survey Date	Air Temperature (°c)		Weather Conditions
	PM	AM	
05/05/22	19	13	Clear, light breeze, no rain
12/05/22	10	10	Clear, light breeze, no rain
18/05/22	14	14	Clear, light breeze, sporadic drizzle
26/05/22	15	14	Clear, no rain

Population Assessment

- 2.18 Where a population of GCN was confirmed, a population size class assessment was completed in accordance with Natural England's standard guidance. The population size class assessment is based on the highest maximum count of great crested newts observed on one survey occasion:

Small – for maximum counts up to 10

Medium – for maximum counts between 11 – 100

Large – for maximum counts over 100

- 2.19 The above classification is a broad category used to indicate the comparative status and importance of a population, which also informs the consideration of the level of impact development may cause as well as having implications with regard to the requirements for mitigation and compensation.

Badgers

- 2.20 All suitable habitats within the site, and accessible land within 30m were assessed for their ability to support badgers *Meles meles*. The standard methodology as recommended by Harris, Creswell and Jefferies (1989)¹⁰ was followed to identify any evidence to suggest the presence of the species, this evidence included;

Setts: including earth mounds, evidence of bedding and runways between setts;

Latrines: often located close to setts, at territory boundaries or adjacent to favoured feeding areas;

Prints and paths or trackways;

Hairs caught on rough wood or fencing;

Other evidence: including snuffle holes, feeding and playing areas and scratching posts.

- 2.21 Evidence of the latter signs on their own cannot be used to confirm the presence of badgers. A collection of signs would need to be identified to confirm the presence of the species.

- 2.22 The status and activity level of any setts identified is categorised as follows:

Main sett: usually continuously used with significant signs of activity, including a large number of holes and conspicuous spoil mounds;

¹⁰ Stephan Harris, Penny Creswell and Jefferies (1989) Surveying Badgers The Mammal Society

Annexe sett: usually found close to a main sett and connected to it by well used paths. Such setts may not be continuously occupied;

Subsidiary sett: lesser-used setts usually comprising a few holes and without associated well-used paths. Such setts are not continuously occupied;

Outlier sett: one or two holes without obvious paths, with a very sporadic use.

2.23 With the level of activity described as:

Active: clear of debris, trampled spoil mounds and obviously active e.g. presence of prints, dislodged guard hairs;

Partially active: some associated debris/moss/plants in the entrance. Could be used with minimal amount of excavation usually with signs in the vicinity of the sett e.g. badger paths etc.

Disused: partially or completely blocked/collapsed.

Bats – Ground Level Tree Assessment

2.24 Tree assessments were undertaken from ground level, with the aid of a torch and binoculars (where appropriate) during the Extended Phase I Habitat survey by an experienced ecologist from FPCR. During the survey, Potential Roosting Features (PRF) for bats were sought in accordance with British Standard¹¹ and current bat survey guidance¹².

¹¹ British Standard 8596:2015 Surveying for bats in trees and woodland, October 2015

¹² Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust

3.0 RESULTS

Desk Study

- 3.1 The locations of designated sites and faunal records (within 1km of the site only) discussed in the following section are illustrated in Figures 1 and 2.

Statutory Designated Sites

- 3.2 No internationally or statutory designated sites for nature conservation interest were located within the 5km of the Site.

Non-Statutory Designated Sites

- 3.3 There are records of five non-statutory sites provided by NBGRC within 1km of the Site (all Local Wildlife Sites (LWS)).
- 3.4 A summary of non-statutory sites can be found below in Table 2 below and in Figure 1.

Table 4: Non-Statutory Sites adjacent to the Site Boundary

Site Name	Designation	Approximate Location/Distance from Site	Reason for Designation
Kelham Hills	LWS	160m west	Broadleaved woodland, plantation of sycamore <i>Acer pseudoplatanus</i> with alder <i>Alnus glutinosa</i> , rowan <i>Sorbus aucuparia</i> and ash <i>Fraxinus excelsior</i> present in small quantities.
Kelham Hall Shingle Bank	LWS	410m east	Large natural shingle bank vegetated with mature willow (<i>Salix</i> sp) trees and tall ruderal vegetation. The site is undisturbed, being on private land and only accessed by a few anglers. It therefore provides ideal nesting opportunities for birds with the large nettle-beds offering habitat for invertebrate species.
Kelham Trent and Island	LWS	650m east	This site comprises an island in the River Trent, plus associated shallow backwaters, channels and riverbank supporting a valuable community of scrub, ruderal vegetation and notable gravel colonists.
Ollerton Road Grasslands	LWS	960m north	Dry neutral grassland, bordered by woodland, mature hedgerows, pasture and arable.
River Trent Kelham Inverts	LWS	430m east	Variety of water beetle species – no further information provided

Fauna

- 3.5 NBGRC also provided records of protected and notable species within 1km of the site. The locations of these records are shown in Figure 2: Site Location and Consultation Results Plan – Species Records, whilst a summary is provided below.

Bats

- 3.6 Records of common pipistrelle *Pipistrellus pipistrellus*, brown long-eared *Plecotus auritus*, Daubenton's, Nathusius's pipistrelle *Pipistrellus nathusii*, *Nyctalus* sp., Leisler's *Nyctalus leisleri*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus*, *Pipistrelle* sp., *Myotis* sp., and unidentified bat species were returned by NBGRC within 1km of the site boundary. Records included roosts and individual bats over the period 2010 to 2017 and were largely associated with Kelham Hall 270m to the east of the site.

Herpetofauna

- 3.7 Records of 3 common toad *Bufo bufo* were provided by NBGRC located to the west and south of the site recorded over a 2012 – 2015 period. The closest record was 240m west.

Notable Plants

- 3.8 Notable plant species include good-king-Henry *Chenopodium bonus-henricus* and *Polystichum x bicknellii*. Records were associated with the fields to the east of the site and spanned the period 2012-2015.

Birds

- 3.9 A number of notable bird species recorded within 1km of the site included typical woodland, general and urban species such as swallow *Hirundo rustica*, house sparrow *Passer domesticus*, swift *Apus apus*, chiffchaff *Phylloscopus collybita* and house martin *Delichon urbicum*. A number of wetland birds were also recorded including oystercatcher *Haematopus ostralegus*, sedge warbler *Acrocephalus schoenobaenus*, kingfisher *Alcedo atthis*. Records were mostly found to the south and east of the site within Kelham Hall grounds.

Other

- 3.10 Records of [REDACTED] hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus* (two records on site) and otter *Lutra lutra* were also recorded in the wider area

Habitats

- 3.11 The habitats described below correspond to those mapped on Figure 3. Plant species lists for the habitats are provided in Appendix A.

Arable

- 3.12 The site was dominated by large arable field compartments that had been recently ploughed and seeded. Poor semi-improved margins were present and varied between 1m – 6m wide with some scrub and ruderal encroaching from the hedgerows. Rare occurrence of typical arable weeds

included spear thistle *Cirsium vulgare*, mayweed *Tripleurospermum* spp. and groundsel *Senecio vulgaris*.



Photograph A: Arable dominating the site

Grasslands

- 3.13 Wider margins and isolated areas of poor semi-improved grassland were dominated by perennial rye-grass *Lolium perenne* with frequent Yorkshire-fog *Holcus lanatus* and meadow foxtail *Alopecurus pratensis* and occasional cock's-foot *Dactylis glomerata*. Forbs were present including frequent white clover *Trifolium repens* and greater plantain *Plantago major* with occasional common mouse-ear *Cerastium fontanum*, common vetch *Vicia sativa* and dandelion *Taraxacum officinale* agg. Rare occurrences of germander speedwell *Veronica chamaedrys*, chickweed *Stellaria media* and cat's-ear *Hypochaeris radicata* were also present with species such as lords-and-ladies *Arum maculatum*, wood avens *Geum urbanum* and petty spurge *Euphorbia peplus* encroaching from the adjacent hedgerow.
- 3.14 To the south alongside ditch D1 an area of rough course grassland was dominated by cock's-foot with occasional perennial rye-grass. Ruderal species were interspersed comprising of frequent cow parsley *Anthriscus sylvestris*, occasional common nettle *Urtica dioica* and curled dock with rare cleavers and ground-ivy *Glechoma hederacea*.



Photograph B: Poor semi-improved grassland field to the east of site alongside ditch D1 (below)

Scattered scrub

- 3.15 To the east scattered scrub was present in discrete areas formed of bramble and willow scrub.

Wet Ditch

- 3.16 Ditch D1 was found to the east of the site intersecting two field boundaries. The ditch was c. 1.5 m wide with aquatic vegetation present including fool's-water-cress and common reed. The banks were vegetated with ruderal species such as common nettle, creeping thistle *Cirsium arvense* and cow parsley.

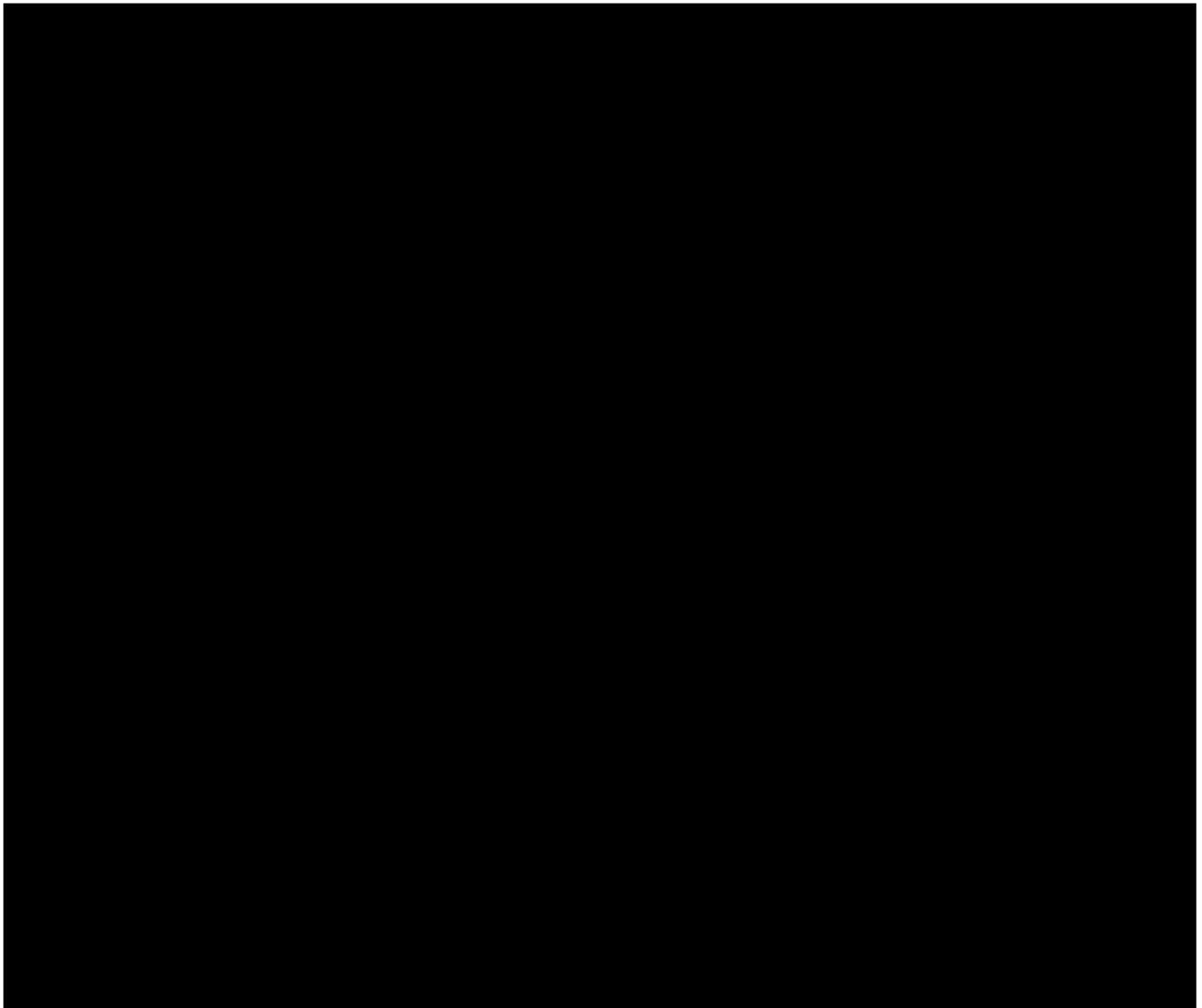


Photograph C: Ditch D1

Hedgerows

- 3.17 A total of 14 hedgerows (H1 to H12, H16 and H17) were recorded within or bordering the site providing a network of connective habitats with links into the wider area. All hedgerows were native species dominant. The most abundant species within the hedgerows were hawthorn, pedunculate oak, ash, bramble and blackthorn *Prunus spinosa*.
- 3.18 All hedgerows lacked any distinct ground-flora with field margins represented by poor semi-improved grassland where present.
- 3.19 The hedgerows were assessed using both HEGS and the wildlife and landscape criteria of the Hedgerow Regulations 1997 further information regarding the quality and ecological value of the hedgerows is provided below and in Appendix B.
- 3.20 All 14 hedgerows subject to assessment consisted of 80% or more native tree and woody shrub species, therefore qualifying as Habitats of Principal Importance (HPI) under NERC. Hedgerows H11-H13, H16 and H17 were evaluated as moderate value (grade 3) under HEGS while hedgerow H2-H10 were evaluated as moderately high to high value (grade 2). Hedgerow H8 is considered important under the wildlife and landscape criteria of the Hedgerows Regulations 1997.

Fauna



Bats

- 3.28 There were no buildings within the site boundary to provide suitable roost opportunities for bats.

Roosting Habitat

- 3.29 Three trees (T1 to T3) located on the site boundary and at field boundaries were identified from ground level as being potentially suitable for roosting bats. Locations are highlighted on Figure 3. No bat roosts were confirmed in accessible features during the ground-based assessments and no evidence of roosting bats was noted.
- 3.30 Tree details of the trees and their levels of bat roosting potential and features are presented in Table 3.

Table 5: Trees with Bat Potential Summary

Tree	Species	Roosting Bat Potential	Features	Photograph
T1	Pedunculate oak <i>Quercus robur</i>	Moderate	Vertical split/lightning strike on southern aspect. Lifted bark	
T2	Ash <i>Fraxinus excelsior</i>	Moderate	Branch tear out 3m and 6m high on northern aspect. Branch split 5m high on main stem. Knot hole on northern aspect 7m high.	
T3	Pedunculate oak <i>Quercus robur</i>	Moderate	Split branches, knot hole and lifted bark. Dense ivy cover on main stem.	

Habitat Assessment

- 3.31 The edges of the site and at field boundaries where grassland habitat was present alongside woodland, trees, scrub, ponds and hedgerows provided suitable foraging habitat for bats, and connectivity for commuting to similar habitats in the surrounding area. The large arable field compartments were largely devoid of other vegetation (such as mature scrub or trees) and therefore lacked the structural diversity which is favoured by bats to forage within or commute along.

Birds

- 3.32 Woody vegetation, including scrub, hedgerows and trees, provided suitable nesting habitat for a range of bird species predominantly around the edges of the site and at field boundaries. These habitats and the grassland and scrub also represent a potentially suitable foraging resource. Bird species that could potentially use these habitats may include small number of species of conservation concern (i.e. NERC S41. and Red and Amber listed Birds of Conservation Concern (BoCC)), such as dunnoek *Prunella modularis*, song thrush *Turdus philomelos*, linnet *Carduelis cannabina* and bullfinch *Pyrrhula pyrrhula*.
- 3.33 The arable fields were considered to provide potential suitable habitat for ground nesting species such as skylark *Alauda arvensis*.

Great Crested Newts (GCN)

Terrestrial Habitat

- 3.34 The hedgerows habitats provided limited suitable terrestrial habitat for great crested newts in the form of poor semi-improved grassland field margins (suitable for foraging) and hedgerows (suitable for shelter and hibernation). The arable habitat that dominated the site is considered to be unsuitable for GCN.

HSI Assessment

- 3.35 Six ponds were identified within 250m of the site boundary (P1 to P3 and P5 to P7), as shown on Figure 4 (from information reviewed as part of the desk study). Assessment of the Habitat Suitability Index (HSI) of pond P1 and P2 indicated that they provided 'good' (Score = 0.73 and 0.74 respectively) habitat for great crested newts during the survey. Pond P6 scored 'below average' suitability (Score = 0.55) and Pond P4 provided 'average' suitability (Score = 0.64). Pond P5 was found to be dry at all survey occasions.
- 3.36 A description of the off-site ponds and the results of the HSI assessment are provided in Table 4.

Table 6: On site Pond Descriptions and HSI Scores

Pond	Description and location	Photograph	HSI Score	HSI Category
P1	Immediately adjacent to the eastern boundary. Approximate 150 x 30m fishing pond. Pond is surrounded by poor semi-improved grassland with scrub at the western bank and bank side trees to the south. Associated vegetation covers steep banks at the ponds edge.		0.73	Good

Pond	Description and location	Photograph	HSI Score	HSI Category
P2	C. 10m east. Approximately 10m x 7m managed pond. Shaded by surrounding woodland. Limited aquatic vegetation including yellow flag iris.		0.74	Good
P3	C. 60m south. Access to pond was denied however aerial photography indicated the pond is approximately 40m x 50m. Well managed and surrounded by scrub and bankside trees.		-	-
P4	C. 200m west. Approximately 10m x 10m pond. Pond is heavily shaded by scrub and trees. And heavily vegetated with grassland and willowherb. The pond was shallow and dries annually		0.64	Average
P5	C. 50m north. Dry pond filled with ruderal vegetation		-	-
P6	C. 180m north. Approximately 25m x 15m pond. Pond is shaded by scrub and trees. And heavily vegetated with ruderal. The pond was very shallow and dries annually		0.55	Below Average

3.37 Aquatic surveys carried out on suitable ponds in 2020 identified a small population size-class (peak count peak of 4 adults) within pond P6 to the north of the site. No GCN were identified in any of the remaining ponds.

- 3.38 Update aquatic surveys were carried out in 2022 and no GCN were recorded. No GCN records were identified during the desk top study. A summary of the survey results is provided in Table 7 and 8 below.

Table 7: Summary of 2020 GCN Aquatic Survey Results

Pond	Peak Adult Count		
	GCN	Smooth Newt	Notes
1	0	0	Fish present
4	0	1	Dries Annually
5	Dry on all survey occasions		
6	<u>4</u>	1	Dries annually - dried by 4 th survey occasion

Table 8: Summary of 2022 GCN Aquatic Survey Results

Pond	Peak Adult Count		
	GCN	Smooth Newt	Notes
1	0	3	Fish present, common frog noted and tadpoles
4	0	4	Dries Annually
5	Dry on all survey occasions		
6	Dry on all survey occasions		

Other Species

- 3.39 The habitats on site provide suitable habitat for hedgehog *Erinaceus europaeus*, in particular the hedgerow habitat for nesting and shelter.
- 3.40 Rabbit and hare associated droppings and worn pathways were recorded within the grassland field and rabbit burrows were identified in the hedgerows, scrub and woodland areas within the site.
- 3.41 Due to a lack of suitable habitat the application site is considered of negligible interest for reptile species, otter, water-vole *Arvicola amphibius* and white-clawed crayfish *Austropotamobius pallipes*, and no evidence of, or potentially suitable habitats for any other protected, rare or notable species was recorded.

4.0 DISCUSSION AND RECOMMENDATIONS

Designated Sites

- 4.1 Five Local Wildlife Sites (LWS) have been identified within 1km of the site. Owing to the nature of the proposals and the distance from these LWSs, it is considered unlikely that the proposed solar farm will result in any adverse direct or indirect impacts to these non-statutory designated sites.

Habitat

- 4.2 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:

Inclusion within specific policy (e.g. veteran trees, ancient woodland and linear habitats in National Planning Policy Framework 2023 (NPPF)), or non-statutory site designation),

Identification as a Habitat of Principal Importance for the conservation of biodiversity under Natural Environment and Rural Communities Act (NERC) 2006 and consequently identification as a Priority Habitat within the relevant Biodiversity Action Plan and a Priority Habitat for England under Biodiversity 2020.

- 4.3 The NPPF is a material consideration in planning decisions and it considers that development should seek to contribute a net gain in biodiversity with an emphasis on improving ecological networks and linkages where possible.
- 4.4 Recently the Environment Act 2021 (9th November 2021) has been passed and will mandate the need for at least a 10% biodiversity net gain (BNG), as calculated using a Biodiversity Metric and a Biodiversity Gain Plan, with habitat used for net gain to be secured for a minimum of 30 years.
- 4.5 Whilst the Act mandates a 10% BNG delivery and for this to be a condition of planning permissions (Part 6 section 98 and Schedule 14 part 1), section 147 (3) states that this will only come into force once the secondary legislation is in place to support this requirement. Therefore, there is a transition period (the length of which is not defined but anticipated as being around 2 years (2023)) until the mandated 10% is required under law.
- 4.6 Any proposals should therefore make provisions to provide high quality green infrastructure, which will not only mitigate for losses within the site but enhance the site and provide wildlife corridors to the wider area.
- 4.7 Given the nature of the proposals it is considered likely that the majority of the boundary habitats for the site and the field compartments (hedgerows and woodland edge) can remain unaffected during construction and operation of the solar farm and battery energy storage system. However, in order to allow for the formation of pedestrian and vehicular access to the site, proposals require two small breaks within hedgerows H7 and H13 which will be compensated for through the planting of new native hedgerows through the site.
- 4.8 The central habitats (currently arable with associated poor semi-improved grassland margins, which are of negligible intrinsic nature conservation value) are likely to be affected during construction however will be reinstated/enhanced on-site and managed in the long-term for their biodiversity value. New areas of grassland will provide meadow areas using a species-rich seed mix and subject to a suitable management regime, guided by a Habitat Management Plan entailing rotational cutting during late summer and autumn. Longer and more tussocky areas of grassland

will also be included, subject to a low intensity management regime and managed to promote their biodiversity value. The landscape Mitigation plan (Sirius Planning 2023) shows the majority of the site will be seeded with a tussocky grass mixture with areas of meadow mixture. Bunds will also be formed and planted with native scrub planting.

- 4.9 Although it is considered unlikely that mature trees would be affected by works, they will be afforded suitable protection during construction activities in accordance with *BS5837:2012 Trees in Relation to Design, Demolition & - Construction – Recommendations*, where required.
- 4.10 The provisions of grassland as described above together with the creation of scrub and new sections of hedgerow and tree planting would increase the biodiversity of the site and establish a net gain of habitat diversity.

Fauna

- 4.11 Principal pieces of legislation protecting wild species are Part 1 of the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 (as amended). Some species, for example badgers, also have their own protective legislation (Protection of Badgers Act 1992). The impact that this legislation has on the Planning system is outlined in ODPM 06/2005 *Government Circular: Biodiversity and Geological Conservation – Statutory obligations and their Impact within the Planning System*.
- 4.12 This guidance states that as the presence of protected species is a material consideration in any planning decision, it is essential that the presence or otherwise of protected species, and the extent to which they are affected by proposals is established prior to planning permission being granted. Furthermore, where protected species are present and proposals may result in harm to the species or its habitat, steps should be taken to ensure the long-term protection of the species, such as through attaching appropriate planning conditions for example.
- 4.13 In addition to protected species, there are those that are otherwise of conservation merit, such as those listed as species of principal importance for the purpose of conserving biodiversity under the NERC Act 2006. These are recognised in the NPPF which advises that when determining planning applications, LPAs should aim to conserve and enhance biodiversity by applying a set of principles including:
- *If significant harm resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused*
 - *Development proposals where the primary objective is to conserve or enhance biodiversity should be encouraged*
- 4.14 The potential implications of the survey findings for developmental design and programming are outlined below.

Bats

- 4.19 Bats and their habitats are protected under the Wildlife and Countryside Act 1981 (as amended) and by the Conservation of Habitats and Species Regulations 2017 (as amended). In summary this makes it an offence to damage destroy or obstruct any place used by bats for breeding and shelter, disturb a bat, or kill, injure, or take a bat. Seven bat species, including brown long-eared bats and soprano pipistrelle, are listed as Species of Principal Importance under the provisions of the NERC Act 2006.

Trees

- 4.20 Three trees located at field boundaries were identified from ground level as being potentially suitable for roosting bats. Under current proposals all trees are to be retained however should any trees be subject to heavy pruning work or should proposals change further assessment will be required.

Habitat Assessment

- 4.21 The boundary features within the site provide habitats that are likely to be used by foraging and commuting bats.
- 4.22 All boundary hedgerows, mature trees and woodland are to be retained and will be incorporated into the site-wide landscape proposals. No lighting is to be installed as part of the operation of the solar farm and battery energy storage system, however security lighting may be implemented for the site compound during the construction phase. High-intensity lighting can have a negative impact upon the use of habitats by bats and other faunal species. The positioning of security lighting

should therefore ensure that any existing boundary hedgerows and woodland remain unlit and dark corridors are maintained¹³.

- 4.23 It is considered that the scheme would have negligible impact on these species and the inclusion of a bat box scheme around the development site where feasible would provide new potential roosting sites.

Breeding and Wintering Birds

- 4.24 The range of habitats within the application site and large field compartments are likely to provide nesting and foraging habitat for some bird species that have been recorded within the local area. Breeding and wintering bird surveys have been undertaken and further information can be found in the separate Breeding and Wintering Bird report (FPCR 2023).
- 4.25 All birds are protected while nesting by the Wildlife and Countryside Act 1981 (as amended) with Schedule-1 bird species afforded additional protection from disturbance while nesting. It is recommended that site clearance works including the removal of any woody vegetation and ground flora is conducted outside the bird breeding season (March – August, inclusive). If clearance or intrusive ground investigations or excavations are planned for the bird breeding season then it should be preceded by a nesting bird survey conducted by an experienced ecologist. This will involve observing any vegetation to identify birds exhibiting nesting behaviour and/or searching for active nests. Should active nests be identified then an exclusion zone would need to be retained until the chicks had fledged as determined by the supervising ecologist.
- 4.26 Breeding opportunities for the local bird assemblage will be enhanced by inclusion of bird nest boxes around the site.

Great Crested Newts

- 4.27 Great crested newts and their habitats in water and on land are protected under the Wildlife and Countryside Act 1981 (as amended), and by the Conservation of Habitats and Species Regulations 2017 (as amended). These make it an offence to damage, destroy or obstruct any place used by great crested newts for breeding or shelter, disturb a great crested newt, or kill, injure or take any great crested newts. In addition, great crested newts are also listed as a species of principal importance under the provisions of the NERC Act 2006.
- 4.28 Aquatic surveys carried out in 2020 identified a small population size-class of GCN (peak count 4 adults) in offsite pond P6. Update surveys carried out in 2022 found no GCN present in any ponds surveyed (including P6). As Pond P6 was found to be dry across all survey occasions it is considered likely that the population in this waterbody has continued to be either very small or no longer present. The pond is situated within an area of rough grassland and scattered scrub enclosed by barbed wire fence and a hedgerow. This area provides potential breeding habitat and good terrestrial habitat for great crested newts. As pond P6 is located c.180m north of the site within good terrestrial habitats it is considered extremely unlikely that GCN would commute to the suboptimal arable habitat onsite.

¹³ The Bat Conservation Trust & the Institute of Lighting Professionals 2018. Guidance Note 08/18 Bats and Artificial Lighting in the UK. Bats and the Built Environment Series [online] Available from: file:///C:/Users/ed/Downloads/ilp-guidance-note-8-bats-and-artificial-lighting-oct-18-compressed.pdf [Accessed 10.07.2020]

- 4.29 Works onsite will largely be in association with the arable field compartments considered to be of negligible value to GCN and works within these areas are not considered to be a constraint to proposals.
- 4.30 Access to pond P2 and P3 was denied, however, due to the 'good' HSI score of pond P2, the proximity to the site and the historic presence of GCN in the wider area as a precautionary measure all construction works within 50m of pond P2 and works within suitable habitat (such as hedgerows and field margins where necessary) within 150m of P2 and P3 should proceed under a Best Practice Method Statement (which will provide details on ecological supervision, timing of works, pre-construction habitat modification (e.g. strimming of grassland) and general working methods):
- Suitable vegetation to be cleared during suitable weather conditions (above 5°C overnight);
 - A check for the presence of GCN and other amphibians will be undertaken by a suitably qualified ecologist immediately prior to vegetation clearance commencing;
 - All arisings to be removed from site, unless otherwise agreed with a suitably qualified ecologist;
 - Areas cleared to be maintained unsuitable for GCN and other amphibians until and throughout construction; and
 - If GCN are recorded on-site at any time during construction, works in that area to stop immediately and a suitably qualified ecologist contacted.
- 4.31 The proposals of extensive grassland and scrub creation will enhance the current conditions on site for amphibians and provide terrestrial habitat of greater suitability for great crested newts. It is considered that as a result of the mitigation and enhancement proposals the Favourable Conservation Status (FCS) of great crested newts will not only be maintained but enhanced as a result of the proposals.

Other Species

- 4.32 The habitats on site provide suitable habitat for hedgehog *Erinaceus europaeus*, in particular the hedgerow habitat for nesting and shelter.
- 4.33 Rabbit and hare *Lepus europaeus*, associated droppings and worn pathways were recorded within the grassland field and rabbit burrows were identified in the hedgerows, scrub and woodland areas within and adjacent to the site.
- 4.34 Proposals will enhance the habitats available to these species through provisions of tussocky and species rich grassland allowing for a more diverse foraging resource while the scrub habitats will provide shelter.

Appendix A: Botanical Species List

Species recorded are mainly dominant, conspicuous or characteristic species. Species lists are therefore not exhaustive of all flora present in each habitat type.

Poor Semi-improved Grassland

Scientific Name	Common Name
<i>Alliaria petiolata</i>	Garlic mustard
<i>Alopecurus pratensis</i>	Meadow foxtail
<i>Anthriscus sylvestris</i>	Cow parsley
<i>Arum maculatum</i>	Lords-and-ladies
<i>Dactylis glomerata</i> ,	Cock's-foot
<i>Taraxacum officinale</i> agg.	Dandelion
<i>Cardamine</i> spp	Bittercress sp
<i>Cerastium fontanum</i>	Common mouse-ear
<i>Cirsium arvense</i>	Creeping thistle
<i>Cirsium vulgare</i>	Spear thistle
<i>Epilobium</i>	Willowherb Sp.
<i>Euphorbia peplus</i>	Petty spurge
<i>Equisetum</i>	A horsetail
<i>Festuca</i> sp.	Fescue
<i>Galium aparine</i>	Cleavers
<i>Geranium dissectum</i>	Cut-leaved crane's-bill
<i>Geum urbanum</i>	Wood avens
<i>Glechoma hederacea</i>	Ground-ivy
<i>Helminthotheca echioides</i>	Bristly Oxtongue
<i>Heracleum sphondylium</i>	Hogweed
<i>Holcus lanatus</i>	Yorkshire- fog
<i>Hyacinthoides non-scripta</i>	Bluebell
<i>Hypochaeris radicata</i>	Cat's ear
<i>Lamium album</i>	White dead-nettle
<i>Lamium purpureum</i>	Red dead-nettle
<i>Lolium perenne</i>	Perennial rye-grass
<i>Myosotis</i>	Forget-me-not sp
<i>Pentaglottis sempervirens</i>	Green alkanet
<i>Plantago lanceolata</i>	Ribwort plantain
<i>Plantago major</i>	Greater plantain
<i>Potentilla reptans</i>	Creeping cinquefoil
<i>Rubus fruticosus</i> agg.	Bramble
<i>Rumex crispus</i>	Curled dock
<i>Rumex obtusifolius</i>	Broad- leaved dock
<i>Senecio jacobaea</i>	Ragwort
<i>Stachys sylvatica</i>	Hedge woundwort
<i>Stellaria media</i>	Common chickweed
<i>Trifolium repens</i>	White clover
<i>Urtica dioica</i>	Common nettle
<i>Veronica chamaedrys</i>	Germander speedwell
<i>Vicia sativa</i>	Common vetch

Ditch D1

Scientific Name	Common Name
Aquatic	
<i>Helosciadium nodiflorum</i>	Fool's-water-cress
<i>Phragmites australis</i>	Common reed
Bankside Vegetation	
<i>Anthriscus sylvestris</i>	Cow Parsley
<i>Cirsium arvense</i>	Creeping thistle
<i>Dactylis glomerata</i> ,	Cock's-foot
<i>Epilobium spp.</i>	Willowherb Sp.
<i>Heracleum sphondylium</i>	Hogweed
<i>Lamium album</i>	White dead-nettle
<i>Rumex crispus</i>	Curled dock
<i>Urtica dioica</i>	Common nettle

Scattered Scrub

Scientific Name	Common Name
<i>Rubus fruticosus</i> agg.	Bramble
<i>Salix × fragilis</i>	Crack willow saplings

Arable weeds

Scientific Name	Common Name
<i>Cirsium vulgare</i>	Spear thistle
<i>Senecio vulgaris</i>	Common Groundsel
<i>Tripleurospermum spp</i>	Mayweed sp

Appendix B: Results of Hedgerow Assessment

Ref	Canopy Species	Length (m)	Height/ Width (m)	Associated Features	HEGS Grade	Important under REGS
H2	Sa, Cm, Rf, Sn, Sf, Ma, Ra, Fe.	360m	2-4/1-2	Unmanaged, <10% gaps, 4 end connections, wet ditch present along 100% of length, semi-natural grass verge present on one side	-2	No
H3	Ra, Fe, Cm, Sn, Ps, Sf	115m	2-4/ 1-2	Managed hedgerow, <10% gaps, 4 end connections, wet ditch present along 100% of length, no semi-natural grass verge present	-2	No
H4	Pr, Cm, Ps, Ra, Sn, Ra, Qr	260m	2-4/ 1-2	Managed hedgerow, <10% gaps, 4 end connections, dry ditch along 100% of length, no semi-natural grass verge present	-2	No
H5	Cm, Ra, Ma, Qr, Sn, Sa, Ps	160m	2-4/ 1-2	Managed hedgerow, <10% gaps, 4 end connections, dry ditch along 100% of length, no semi-natural grass verge present.	-2	No
H6	sn, Ps, Cm	65m	2-4/1-2	Managed hedgerow, <10% gaps, 4 end connections dry ditch along 100% of length, semi-natural grass verge present on one side.	-2	No
H7	Cm, Ps, Fe, Ac, Qr, Sn, Up	265m	2-4/ 1-2	Managed hedgerow, no gaps, 4 end connections, dry ditch 100% of length, semi-natural grass verge present on one side.	-2	No
H8	Sa, Up, Ra, Ps, Cm	280m	2-4/ 1-2	Managed hedgerow, <10% gaps, 4 end connections, wet ditch 100% of length, no semi-natural grass verge present, Adjacent to PRoW.	-2	Yes
H9	Ps, Cm, Ac, Sa, Fe, Ra	260m	2-4/ 1-2	Managed hedgerow, no gaps, 4 end connections, wet ditch 100% of length, no semi-natural grass verge present	-2	No
H10	Ps, Ra, Fe, Ca, Qr	110m	2-4/ 1-2	<10% gaps, 4 end connections (one woodland), dry ditch along 100% of length, no semi-natural grass verge present	-2	No

Ref	Canopy Species	Length (m)	Height/ Width (m)	Associated Features	HEGS Grade	Important under REGS
H11	Cm, Ra, Ps	300m	2-4/ 1-2	no gaps, 2 end connections (woodland), wet ditch 100% of length, no semi-natural grass verge present	3+	No
H12	Cm, Sn, Up, Pr, Ac	290m	2-4/ 1-2	Managed hedgerow, 30-10% gaps, 2 end connections, no semi-natural grass verge present	3	No
H13	Cm,Fe, Up, Ti, Sn, Qr, Ap	680m	1-2/1-2	Hawthorn dominant hedgerow in the north. <10% gaps, 3 end connections (woodland), dry ditch, no semi-natural grass verge present	3+	No
H16	Rf, Cm, Ps, Fe, Ac	250m	1-2m/1-2m	10% gaps, no end connections, wet ditch along 100% of length, no semi-natural grass verge present	3-	No
H17	Cm, Ac, Fe, Ps, Ma, Fe, Up, Cs	600m	2-4/1-2	10% gaps, 2 end connections, dry ditch, no semi-natural grass verge present	3+	No

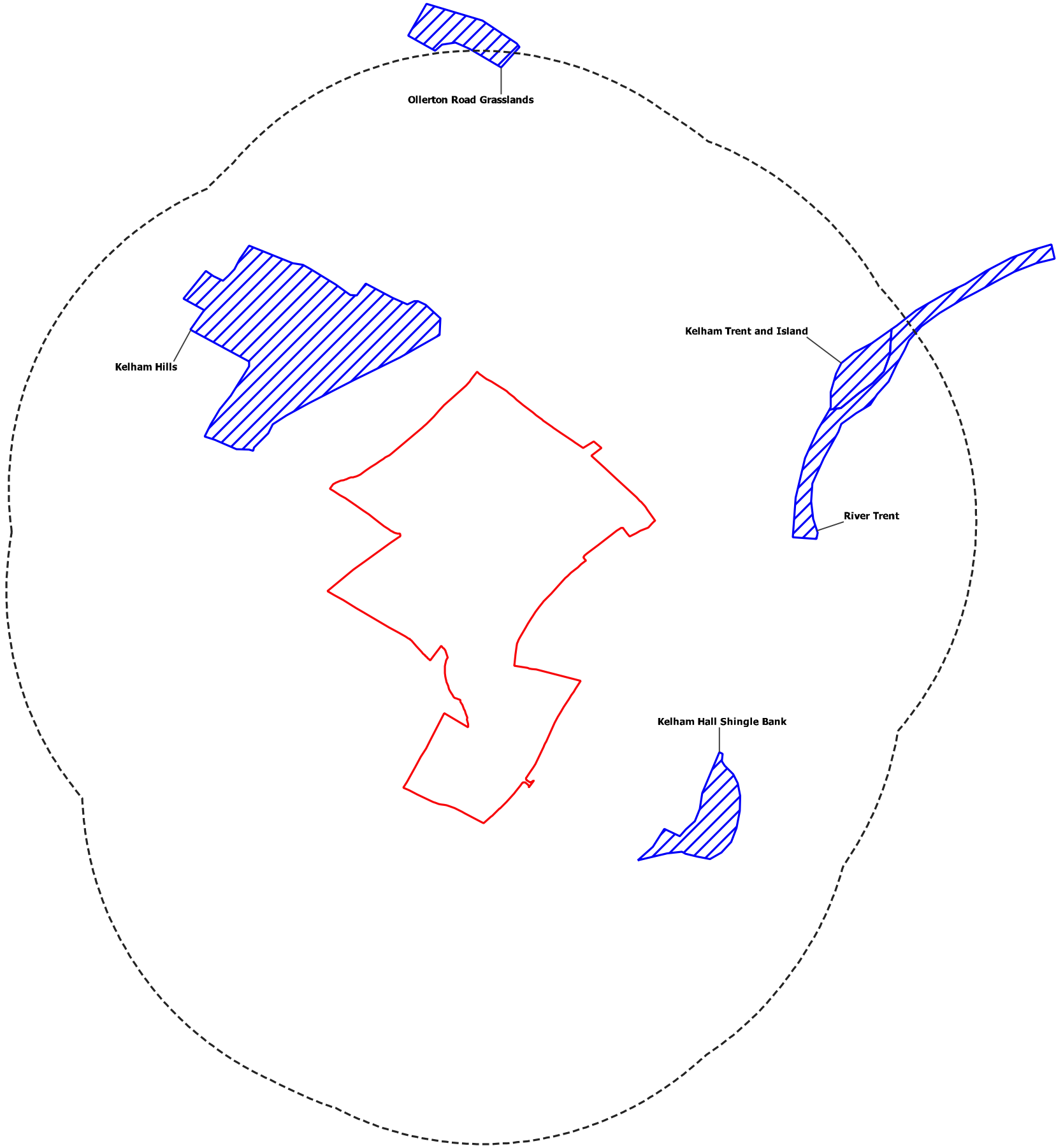
Key: Ac: Acer campestre field maple, Ah: Aesculus hippocastanum horse chestnut, Ap: Acer pseudoplatanus sycamore, Cm: Crataegus monogyna Hawthorn, Fe: Fraxinus excelsior Ash, Ps Prunus spinosa Blackthorn, Ra: Rosa agg. Rose, Rf: Rubus fruticosus agg. Bramble, Qr: Quercus robur Pendulate Oak, Sa: Salix Spp willow spp. Sn: Sambucus nigra elder, Ma: Malus apple spp, Sf: salix x fragilis crack willow, Pr: Prunus Spp., Up: Ulmas procera English Elm, Ti: Tilia Lime spp., Ia: Ilex aquifolium, Holly, Bp: Betula pendula Silver birch, Fs: Fagus sylvatica beech, Sv: Syringa vulgaris Lilac, Cs: Cornus sanguinea dogwood, Lo: Ligustrum ovalifolium garden privet

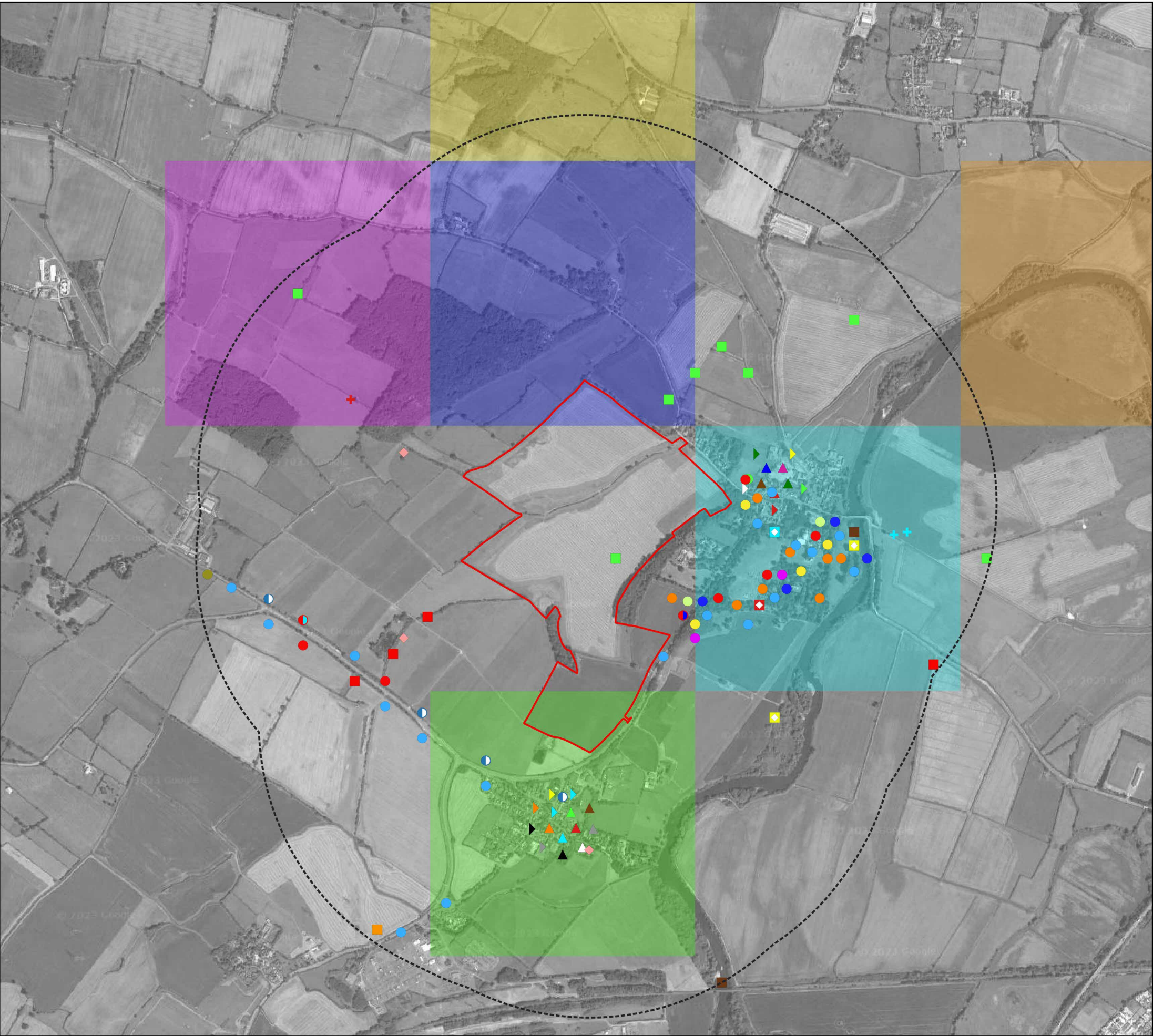
This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Aerial Imagery © 2023 Bluesky, Getmapping plc, Infoterra Ltd and Bluesky, Maxar Technologies, Map data © 2023 Google

Key

- Site Boundary
- 1km Buffer
- 2km Buffer
- Local Wildlife Site (LWS)





This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Aerial Imagery © 2023 Bluesky, Getmapping plc, Infoterra Ltd and Bluesky, Maxar Technologies, Map data © 2023 Google

Key

- Site Boundary

1km Buffer
- Bats**

Brown Long-eared

Common Pipistrelle

Daubenton's

Leisler's

Myotis sp.

Nathusius's Pipistrelle

Natterer's

Noctule

Nyctalus sp.

Pipistrelle sp.

Soprano Pipistrelle

Unidentified Bat sp.

Birds

Barn Swallow

Common Buzzard

Common Chiffchaff

Common Kingfisher

Common Swift

Great spotted Woodpecker

Grey Partridge

Grey Wagtail

Hobby

House Martin

House Sparrow

Kestrel

Kingfisher

Little Owl

Marsh Tit

Mute Swan

Northern Lapwing

Oystercatcher

Sedge Warbler

Tawny Owl

Woodcock

Herpetofauna

Common Toad

Invasive and Non-Native Species (INNS)

Chinese Mitten Crab

Brown Hare

Himalayan balsam

Hedgehog

Otter

Japanese knotweed

Polecat

Notable Plants

Good-king-Henry

Polystichum x bicknellii

Species Records of 1km Accuracy

Species within SK7657: Brown hare

Species within SK7556: Brown hare

Species within SK7656: House martin; House sparrow; Marsh tit; Spotted flycatcher; Wood pigeon; Wren

Species within SK7856: Himalayan balsam; Corn marigold

Species within SK7755: red kite

Species within SK7654: Himalayan balsam; Hedgehog

FPCR Environment and Design Ltd, Lockington Hall, Lockington, Derby, DE74 2RH ■ t:01509 672 772 ■ e: mail@fpcr.co.uk ■ w: www.fpcr.co.uk ■
masterplanning ■ environmental assessment ■ landscape design ■ urban design ■ ecology ■ architecture ■ arboriculture

0 250 500 m

client

Sirius Planning

project

Solar Farm,
Kelham, Newark

drawing title

SITE LOCATION AND CONSULTATION
RESULTS PLAN - SPECIES RECORDS

scale @ A3

1:15000

drawn

EH / LG

issue date

29/8/2023

drawing / figure number

Figure 2

rev

-

\\FPCR-FS-01\EarlyWork\9500\9511\ECO\QGIS\QGIS 2.14\Plans\consultation plans\9511-E-02 Site Location and Consultation Results Plan - Species Records - Updated 17.05.22.qgs

This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Aerial Imagery © 2022 Bluesky, Getmapping plc, Infoterra Ltd and Bluesky, Maxar Technologies, Map data © 2022 Google

Key

- Site Boundary
- Tree with bat potential (with ref)
- Broadleaved tree
- Wet ditch
- Hedgerow (with ref)
- Scrub - scattered line
- Built Environment: Buildings/hardstanding
- A Cultivated/disturbed land - arable
- SI Poor semi-improved grassland



0 100 200 m

client
Sirius Planning

project
**Solar Farm,
Kelham, Newark**

drawing title
PHASE 1 HABITAT PLAN

scale @ A3
1:5,500

drawn
RCO

issue date
1/9/2023

drawing / figure number
Figure 3

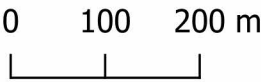


This drawing is the property of FPCR Environment and Design Ltd and is issued on the condition it is not reproduced, retained or disclosed to any unauthorised person, either wholly or in part without written consent of FPCR Environment and Design Ltd.

Aerial Imagery © 2022 Bluesky, Getmapping plc, Infoterra Ltd and Bluesky, Maxar Technologies, Map data © 2022 Google

Key

- Site Boundary
- 250m site buffer
- Waterbodies (with reference)



client
Sirius Planning
project
Solar Farm,
Kelham, Newark
drawing title
POND LOCATION PLAN

scale @ A3
1:8,000
drawing / figure number
Figure 4
drawn
RCO
issue date
13/9/2023
rev
9511-E-01

