



# Appendix 2.1: Extended Phase 1 Habitat Survey Report

Kingston Solar Farm

25/01/2022



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## INTRODUCTION

### Background

- 1.1. Neo Environmental Ltd has been appointed by Renewable Energy Systems (RES) Ltd (the “Applicant”) to complete a Phase 1 habitat survey for a proposed 49.9MW solar farm with associated infrastructure (the “Proposed Development”) on lands circa 1.3km south of Gotham and c. 0.75km northwest of East Leake, Nottinghamshire (the “Application Site”).
- 1.2. Please see **Figure 4 of Volume 2: Planning Application Drawings** for the layout of the Proposed Development.

### Development Description

- 1.3. The Proposed Development will consist of the construction of a 49.9MW solar farm with bi-facial solar photovoltaic (PV) panels mounted on metal frames, new access tracks, underground cabling, perimeter fencing with CCTV cameras and access gates, two temporary construction compounds, substation and all ancillary grid infrastructure and associated works.
- 1.4. The Proposed Development will result in the production of clean energy from a renewable energy resource (daylight) and will also involve additional landscaping including hedgerow planting and improved biodiversity management.

### Site Description

- 1.1. The Application Site is located on lands circa 1.3km south of Gotham and c. 0.75km northwest of East Leake, Nottinghamshire; the approximate centre point of which is Grid Reference E453185, N328739. Comprising 16 agricultural fields and additional ancillary areas, the Application Site measures c. 80.65 hectares (ha) in total, with only c. 55.65 hectares accommodating the solar arrays themselves. See **Figure 1 of Volume 2: Planning Application Drawings** for details.
- 1.2. The Proposed Development Site is split into two sections, north and south, by an area of woodland, Leake New Wood. Both sections lie on elevated, gently undulating land ranging between 87 – 96m AOD. The northern section extends across several rectilinear agricultural fields largely contained by existing mixed woodland providing good screening for the wider area. These include Gotham Wood to the north, Cuckoo Bush to the east, Leake New Wood to the south and Crownend Wood to the west. The southern section is also surrounded by pockets of woodland including Oak Wood, Crow Wood and Ash Spinney.
- 1.3. The Application Site is in an area with an existing industrial presence with a telecoms mast located on the southwestern boundary of Field 7, a wood pole line along the boundary between Fields 7 and 8 and within the southern section of Fields 4 and 5 and overhead lines

located along the southern boundary of Field 16 and the eastern boundary of Field 15 (See **Figure 3 of Volume 2: Planning Application Drawings** for field numbers).

- 1.4. The surrounding area is semi-rural in nature with the site being surrounded by agricultural fields and woodland in most directions. The area is however punctuated by individual farmsteads and Rushcliffe Golf Club is located on the eastern boundary of Field 15 in the southern section of the site. There are also various industrial brownfield sites within the locality including Charnwood Truck Services located directly southwest of Field 4. Additionally, there is a large-scale power station located beyond the A453, circa 1.58km north of the site.
- 1.5. Recreational routes include a number of Bridleways (BW) which cross or abut the Site providing connectivity to the wider Kingston Estate. These include Gotham BW No. 10, 11 and 12 and West Leake BW's No. 5 and 13. West Leake BW No. 5, also known as the Midshires Way, is also a Long-Distance Walking Association (LDWA) Route bordering the southern boundary of Fields 15 and 16. While there are several field drains throughout the Application Site, it lies entirely within Flood Zone 1, an area described as having a "Low probability" of flooding.
- 1.6. The Application Site will be accessed from Wood Lane, which is an unadopted road. Delivery vehicles will exit the M1 at junction 24, signposted A453 Nottingham (S), onto the A453 and travel in a northeast direction for approximately 4.3km, before taking the exit onto West Leake Lane. This road will be travelled on in a southern direction for approximately 1.5km, before turning left onto Kegworth Road. Vehicles will travel northeast along this road for approximately 1.3km before turning right into Wood Lane.

## METHODOLOGY

### Extended Phase 1 Habitat Survey

- 1.7. The survey methods employed were taken from current Chartered Institute of Ecology and Environmental Management<sup>1</sup> (CIEEM) and Joint Nature Conservation Committee<sup>2</sup> (JNCC) guidance.
- 1.8. An extended phase 1 habitat survey of the majority of the Application Site was undertaken on 26<sup>th</sup> February 2021 by Kevin Johnson BSc Pgd PGCE MCIEEM. The remainder of the site was surveyed on 29<sup>th</sup> June 2021 by Daniel Flenley BSc (Hons) MPhil MCIEEM. Both surveyors are experienced ecologists. **Table 1** describes the weather conditions across the survey dates, giving temperature (°C), wind, cloud cover (%) and precipitation.

**Table 1: Weather Conditions at Time of Survey**

Survey Date	Temperature (°C)	Wind Speed (m/s) and Direction	Cloud Cover (%)	Precipitation
26/02/2021	1-13	1-3, north-westerly through north-easterly	0 - 50%	Nil
29/06/2021	24	2.7-4.3, south-westerly	80%	Nil

- 1.9. All habitats within the Application Site, plus a 50m buffer where accessible, were surveyed; this constitutes the Ecological Study Area (“ESA”). Habitats were mapped using ArcGIS or similar software in line with JNCC Phase 1 habitat survey methodology. Aerial photography and OS maps were evaluated to aid in the assessment of boundary features and habitat boundaries. Target Notes were used to identify the presence and location of features of particular ecological interest or those too small to map. Habitat features indicating the presence, or likely presence, of protected species or other species of nature conservation interest were also noted, as were direct observations of such species.

### Badger

- 1.10. Badger setts were recorded if found. Any signs such as dung pits, latrines, hair, footprints and snuffle holes were noted.

<sup>1</sup> CIEEM (2017) Guidelines for Preliminary Ecological Appraisal

<sup>2</sup> JNCC (2010) Handbook for Phase 1 Habitat Survey - A Technique for Environmental Audit

## Great Crested Newt Survey

- 1.11. All great crested newt (“GCN”) survey work was conducted by an experienced field ecologist with a Natural England GCN survey licence. Survey work was carried out by Kevin Johnson BSc Pgd PGCE MCIEEM (class licence 2015-16749-CLS-CLS).
- 1.12. Access to ponds outside the Applicant’s ownership was sought by telephone, email and/or letter ahead of surveys, allowing 31 days for response.

## Habitat Suitability Index (HSI) Assessment

- 1.13. Access was granted to two of the three ponds identified within 500m of the Application Site. The area was therefore visited on 26<sup>th</sup> February 2021 to conduct an indicative HSI assessment of the accessible ponds. Methods largely followed the Amphibian and Reptile Groups of the United Kingdom’s *Advice Note 5: Great Crested Newt Habitat Suitability Index*, an adaptation of the original HSI, as recommended by Natural England. The sole change was that two factors (see **Appendix B**) were assessed outside their core season, giving an indicative rather than an absolute score.
  - 1.14. This includes field assessment of several variables of the pond and surrounding terrestrial habitat, along with a desk-based assessment that covers other relevant factors relating to each pond.
  - 1.15. The variables are:
    - Geographic location
    - Pond area (size)
    - Permanence
    - Water quality
    - Shade
    - Waterfowl presence
    - Fish presence
    - Pond count within 1km
    - Terrestrial habitat quality
    - Macrophytes present.
  - 1.16. The HSI is a numerical index between 0 and 1, wherein a score of 1 represents optimal habitat for GCN. Each of the above variables is assigned a numerical figure, and these are then used to calculate the tenth root of the product.
  - 1.17. The calculated HSI score is used to define the habitat suitability of the pond on a categorical scale. It should, however, be noted that the system is not precise enough to allow the conclusion that a pond with a high score will definitely support GCN whilst those with a low score will not.



1.18. A breakdown of HSI scoring can be seen in **Table 2** below.

**Table 2: Relation between HSI and Pond Suitability**

HSI SCORE	POND SUITABILITY FOR GCN
<0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
>0.8	Excellent

## eDNA Survey

1.1. Ponds rated as having excellent, good or average suitability are usually subjected to eDNA sampling. However, the only suitable pond was located in an area of historic gypsum mining. Due to undercutting around the edge of the pond, a surveyor would not be able to reach the water column safely. No eDNA testing could therefore be carried out.

## Constraints

- 1.2. As some areas adjacent to the Application Site within the ESA were in different landownership, not all these areas could be accessed fully. However, these were viewed from land within the Application Site wherever possible, and no significant constraint has been identified as a result.
- 1.3. The absence of a particular species during a field survey does not necessarily mean it is wholly absent. Absence of a species during surveys may simply mean it could not be detected or was not using the site at the time the visit was undertaken. Likely absence may, however, be inferred from a combination of factors.
- 1.4. The survey of Fields 1 to 16 and the intervening woodland (i.e. all lands except the extremity north of Field 5; see **Figure 3 of Volume 2: Planning Application Drawings**) was performed outside the optimal season for botanical surveys (which is April to September). However, given the habitats encountered, it is not considered that this places a significant constraint on the interpretation of the Application Site's ecological interest.

## RESULTS

### Habitats

1.5. Habitats recorded within the survey areas include:

- A1.1.2 Broadleaved Semi-natural Woodland,
- A1.2.2 Coniferous Plantation Woodland,
- A2.1 Dense Scrub,
- A3.1 Broadleaved Parkland / Scattered Trees,
- B4 Improved Grassland,
- B5 Marshy Grassland,
- B6 Poor Semi-improved Grassland,
- C3.1 Tall Ruderal,
- J1.1 Arable,
- J1.2 Amenity Grassland,
- J2.1.2 Intact Hedge - Species-poor,
- J2.2.2 Defunct Hedge - Species-poor,
- J2.3.2 Hedge with Trees - Species-poor,
- J2.4 Fence,
- J2.6 Dry Ditch,
- J3.6 Buildings,
- J4 Bare Ground,
- J5 Other Habitat (Garden).

1.6. A map of the habitats is given as **Figure 2.3 of Technical Appendix 2**, with photographs in **Appendix A** of this report. The target notes referred to in Figure 2.2 are detailed in **Table 2** below.

Table 2: Target Notes

Target Note	Description
1	Low bat roosting potential
2	Bluebells
3	Oak with low bat roosting potential
4	Ash with low bat roosting potential
5	Weeping willow
6	Oak with low bat roosting potential
7	Ash and oak with low bat roosting potential
8	Ash with low bat roosting potential
9	Ash with low bat roosting potential
10	Oak with low bat roosting potential
11	Oaks with some bat roosting potential
12	Oak with low bat roosting potential
13	Two ash trees with low bat roosting potential
14	Oak with low bat roosting potential
15	Ash with low bat roosting potential
16	Oak with low bat roosting potential

17	Ash with low bat roosting potential
18	Ash with low bat roosting potential
19	Native species-poor hedgerow, circa 3m deep and up to 3m high. Unkempt, fairly dense. Hawthorn and blackthorn both abundant; dog rose plus understorey bramble and <i>Epilobium</i> all rare. Dense field layer.
20	Hedgerow is raised on verge in places and sunken behind it elsewhere. Black bryony and field bindweed both rare climbing.
21	Mammal push-throughs
22	Maize field

1.7. A plant species list is given in **Table 3** below. The abundance of these species is scored using the DAFOR scale, as follows:

- Dominant (D)
- Abundant (A)
- Frequent (F)
- Occasional (O)
- Rare (R).

**Table 3: Plant Species Recorded**

Common Name	Scientific Name	DAFOR
<b>Trees</b>		
Pedunculate Oak	<i>Quercus robur</i>	F
Alder	<i>Alnus glutinosa</i>	O
Scots Pine	<i>Pinus sylvestris</i>	F

Ash	<i>Fraxinus excelsior</i>	F
Poplar sp.	<i>Poplar sp.</i>	R
Cypress sp.	<i>Cypress sp.</i>	R
European Larch	<i>Larix decidua</i>	O
Silver Birch	<i>Betula pendula</i>	R
Crack Willow	<i>Salix fragilis</i>	R
Aspen	<i>Populus tremula</i>	R
Goat Willow	<i>Salix caprea</i>	R
Apple sp.	<i>Malus domestica sp.</i>	R
Weeping Willow	<i>Salix babylonica</i>	R
Sycamore	<i>Acer pseudoplatanus</i>	O
Cherry	<i>Prunus avium</i>	R
Crab Apple	<i>Malus sylvestris</i>	R
Dutch Elm	<i>Ulmus x hollandica var.</i>	R
<b>Shrubs</b>		
Hawthorn	<i>Crataegus monogyna</i>	F
Bramble	<i>Rubus fruticosus agg.</i>	O
Dogrose	<i>Rosa canina agg</i>	R

Blackthorn	<i>Prunus spinosa</i>	O
Elder	<i>Sambucus nigra</i>	O
Ivy	<i>Hedra helix</i>	O
Gorse	<i>Ulex europaeus</i>	R
Yew	<i>Taxus baccata</i>	O
Holly	<i>Ilex aquifolium</i>	R
Dogwood	<i>Corus sanguinea</i>	R
Hazel	<i>Corylus avellana</i>	O
Honeysuckle	<i>Lonicera periclymenum</i>	R
Guelder Rose	<i>Viburnum opulus</i>	O
Wild Privet	<i>Ligustrum vulgare</i>	R
Field Maple	<i>Acer campestre</i>	O
<b>Herbaceous Plants</b>		
Bristly Oxtongue	<i>Picris echioides</i>	R
Common Mouse-ear	<i>Cerastium holosteoides</i>	R
Scentless Mayweed	<i>Tripleurospermum inodorum</i>	R
Spear Thistle	<i>Cirsium vulgare</i>	R
Creeping Buttercup	<i>Ranunculus repens</i>	O

Dandelion	<i>Taraxacum officinale agg</i>	R
Hedgerow Crane's-bill	<i>Geranium pyrenaicum</i>	R
Ribwort Plantain	<i>Plantago lanceolata</i>	R
Common Nettle	<i>Urtica dioica</i>	O-F
Bush Vetch	<i>Vicia sepium</i>	R
Goosegrass	<i>Gallium aparine</i>	O
Broad-leaved Dock	<i>Rumex obtusifolius</i>	O
Hoary Willowherb	<i>Epilobium parviflorum</i>	O
Hogweed	<i>Heracleum sphondylium</i>	O
Cow Parsley	<i>Anthriscus sylvestris</i>	O
Bluebell	<i>Hyacinthoides non-scriptus</i>	O
Common Field Speedwell	<i>Veronica persica</i>	O
Cut-leaved Crane's-bill	<i>Geranium dissectum</i>	R
Curled Dock	<i>Rumex crispus</i>	R
Common Ragwort	<i>Senecio jacobaea</i>	R
Meadow Crane's-bill	<i>Geranium pratense</i>	R
Creeping Thistle	<i>Cirsium arvense</i>	R
Hedge Woundwort	<i>Stachys sylvatica</i>	R

Green Alkanet	<i>Pentaglottis sempervirens</i>	R
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>	R
Groundsel	<i>Senecio vulgaris</i>	R
Dog's Mercury	<i>Mercurialis perennis</i>	R
White Clover	<i>Trifolium repens</i>	O
Foxglove	<i>Digitalis purpurea</i>	R
Spanish Bluebell	<i>Hyacinthoides hispanica</i>	R
Yellow Iris	<i>Iris pseudacorus</i>	O
Lesser Celandine	<i>Ranunculus ficaria</i>	R
Daffodil	<i>Narcissus sp.</i>	O
Garden Geranium sp.	<i>Geranium sp.</i>	R
Snowdrop	<i>Galanthus nivalis sp.</i>	R
Lamb's-ear	<i>Stachys byzantina</i>	R
Lords and Ladies	<i>Arum maculatum</i>	R
Perforate St John's-wort	<i>Hypericum perforatum</i>	R
Common Chickweed	<i>Stellaria media</i>	R
Wavy Bitter-cress	<i>Cardamine flexuosa</i>	R
Daisy	<i>Bellis perennis</i>	R



Ground Ivy	<i>Glechoma hederacea</i>	R
Wood Avens	<i>Geum urbanum</i>	R
Common Water-starwort	<i>Callitriche stagnalis</i>	R
Herb Robert	<i>Geranium robertianum</i>	R
Common Centaury	<i>Centaureum erythraea</i>	R
Colt's-foot	<i>Tussilago farfara</i>	R
Perennial Sow-thistle	<i>Sonchus arvensis</i>	R
Sainfoin	<i>Onobrychis vicifolia</i>	R
Greater Plantain	<i>Plantago major</i>	R
Selfheal	<i>Prunella vulgaris</i>	R
Common Sorrel	<i>Rumex acetosa</i>	R
White Dead-nettle	<i>Lamium album</i>	R
Yarrow	<i>Achillea millefolium</i>	R
<b>Grasses</b>		
Ryegrass sp.	<i>Lolium sp.</i>	A
Cocksfoot	<i>Dactylis glomerata</i>	O
Velvet Bent	<i>Agrostis canina</i>	O
Common Couch	<i>Elymus repens</i>	R

Tufted Hair-grass	<i>Deschampsia cespitosa</i>	O-R
Yorkshire Fog	<i>Holcus lanatus</i>	O
Crested dog's-tail	<i>Cynosurus cristatus</i>	R
Floating Sweet-grass	<i>Glyceria fluitans</i>	R
Wood Millet	<i>Milium effusum</i>	R
Timothy	<i>Phleum pratense</i>	O
False Oat Grass	<i>Arrhenatherum elatius</i>	O
Smooth Meadow-grass	<i>Poa pratensis</i>	O-F
<b>Sedges</b>		
Common Sedge	<i>Carex nigra</i>	R
Pendulous Sedge	<i>Carex pendula</i>	R
<b>Rushes</b>		
Hard Rush	<i>Juncus inflexus</i>	O
Soft Rush	<i>Juncus effusus</i>	R
<b>Ferns</b>		
Male Fern	<i>Dryopteris filix-mas</i>	R
<b>Mosses</b>		
Springy Turf-moss	<i>Rhytidiadelphus squarrosus</i>	R
Common Feather Moss	<i>Kindbergia praelonga</i>	R

- 1.8. The main habitats present at the Application Site are improved grassland and arable land. Fields one to eleven consist of commercial ryegrass whilst fields twelve to sixteen consist of arable fields lined mostly by Hawthorn hedgerows.
- 1.9. The cable route runs along a ride through the Leake New Wood between Fields 11 and 12.

## PROTECTED SPECIES

### Bats

- 1.10. The hedgerows and ditches within the Application Site, as well as the many wooded areas and coniferous and broadleaved woodland plantations adjacent to the site, provide foraging and commuting features for bats. These features are largely unlit, being screened from lighting associated with houses, farm buildings or roads. The majority of the site is arable land, offering more limited foraging interest (generally restricted to the larger British bat species).

### Buildings

- 1.11. Barns and a house (Cuckoo Bush Farm) are present to the north of the Application Site boundary. These were not accessible for bat roost assessment as they fall beyond the site boundaries. However, given the nature of the proposals, this was not considered essential to impact assessment.

### Trees

- 1.12. The target notes on **Figure 2.2** and in **Table 2** include sixteen trees with low bat roost potential. Six of these are within the Application Site boundary. A group of oaks to the north of the central track also offers some bat roost potential. This has not been assessed in detail; the trees lie outside the Application Site and will not undergo work as a result of the proposals.

### Badger

- 1.13. No evidence of badger was recorded during the site visits. A topographical surveyor reported possible badger evidence from the east of the site, but this appears to have been an erroneous identification. The woodland adjacent to the Application Site (and, to a lesser extent, the dense scrub within the site) provides sett-building habitat for this species. The hedgerow, arable and improved grassland habitats offer foraging opportunities.

### Other Mammals

- 1.14. Roe deer, muntjac deer, common shrew, grey squirrel and brown hare were recorded during the survey. Signs of rabbit, European mole and red fox were also noted.

- 1.15. The hedgerows and improved grassland within the Application Site and the adjacent woodland provide suitable habitat for hedgehog, despite no sign of the species during the survey.
- 1.16. Brown hare is a UK Priority species<sup>3</sup>. However, the presence of roe deer, muntjac deer, common shrew, mole, red fox and any other wild common mammals that may use the habitats within the Application Site is considered to be of limited intrinsic nature conservation interest.
- 1.17. No signs of otter, water vole or other aquatic mammals were noted. The agricultural drainage ditches within the Application Site are considered to offer, at best, very limited opportunities for these species.

## Amphibians

- 1.18. The Application Site was assessed for its suitability to support great crested newt and other amphibians. The ditches within the ESA were observed to be agricultural drains, and considered unlikely to support breeding great crested newts.
- 1.19. Two ponds (Ponds 2 and 3; see **Figure 2.1.1**) were subject to indicative Habitat Suitability Index assessment. Based on this, Pond 2 is considered to have poor habitat suitability for GCN. Pond 3 provides good habitat for GCN. However, further eDNA testing of Pond 3 were not possible due to safety constraints. It is therefore possible that GCN utilise terrestrial habitats within the site.
- 1.20. In addition to these nearby ponds, hedgerows, grassland and woodland habitats within and adjacent to the Application Site offer suitable terrestrial habitat for multiple herptile species.

## Reptiles

- 1.21. The hedgerows, scrub and adjacent woodland offer suitable reptile shelter and hibernation habitat. The longer areas of improved grassland and arable field margins provide suitable foraging habitat for common reptiles.

## Birds

- 1.22. **Table 4** lists bird species recorded in the ESA during the survey.

**Table 4: Bird Species Recorded**

Common Name	Scientific Name
Wren	<i>Troglodytes troglodytes</i>

<sup>3</sup> See <https://hub.jncc.gov.uk/assets/98fb6dab-13ae-470d-884b-7816afce42d4>

Blackbird	<i>Turdus merula</i>
Robin	<i>Erithacus rubecula</i>
Carrion Crow	<i>Corvus corone</i>
Wood Pigeon	<i>Columba palumbus</i>
Green Woodpecker	<i>Picus viridis</i>
Reed Bunting	<i>Emberiza schoeniclus</i>
Redwing	<i>Turdus iliacus</i>
Skylark	<i>Alauda arvensis</i>
Pheasant	<i>Phasianus colchicus</i>
Great Tit	<i>Parus major</i>
Buzzard	<i>Buteo buteo</i>
Great Spotted Woodpecker	<i>Dendrocopos major</i>
Dunnock	<i>Prunella modularis</i>
Jay	<i>Garrulus glandarius</i>
Mallard	<i>Anas platyrhynchos</i>
Chaffinch	<i>Fringilla coelebs</i>
Blue Tit	<i>Cyanistes caeruleus</i>
Yellowhammer	<i>Emberiza citrinella</i>

Red-legged Partridge	<i>Alectoris rufa</i>
Jackdaw	<i>Corvus monedula</i>
Goldfinch	<i>Carduelis carduelis</i>
Starling	<i>Sturnus vulgaris</i>
Fieldfare	<i>Turdus pilaris</i>

1.23. These species are all relatively common and abundant in England. Nesting habitat is present for a number of these species in the form of hedgerows and nearby woodland. Some others, notably the UK red-listed<sup>4</sup> (though still relatively common) skylark, may attempt to use the grassland or arable habitats to nest.

## Invertebrates

1.24. Table 5 lists the invertebrate species recorded during the survey. Both were recorded infrequently.

**Table 5: Invertebrate Species Recorded**

Common Name	Scientific Name
<b>Butterflies</b>	
Peacock	<i>Inachis io</i>
<b>Other Insects</b>	
7-spot Ladybird	<i>Coccinella septempunctata</i>

## Other Species

1.25. No evidence of other protected or Priority species or invasive plant species was recorded during the surveys.

<sup>4</sup> Eaton M.A. *et al.* (2015) Birds of Conservation Concern 4: the population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds 108, 708–746. Available online at [britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf](http://britishbirds.co.uk/wp-content/uploads/2014/07/BoCC4.pdf)

# APPENDICES

Appendix A – Photographs

Appendix B – HSI Assessment Results

Appendix C – Figures

- Figure 2.1.1: Pond Map

## APPENDIX A: PHOTOGRAPHS

- 1.26. All field numbers noted in photographs refer to those illustrated on **Figure 3 of Volume 2: Planning Application Drawings**.

**Photograph 1: View of Field 1 to the west**





Photograph 2: Hedgerow separating Field 1 and 2



Photograph 3: View of Field 3 facing west



Photograph 4: Field 4, and hedgerow between Fields 3 and 4



Photograph 5: Copse in the northeast corner of Field 5





Photograph 6: Farm Building to the northeast corner of Field 6



Photograph 7: Target Note 1 in Field 6: tree with low bat roosting potential



Photograph 8: View of Cuckoo Bush Farm from Field 6



Photograph 9: Target Note 3 in Field 6: oak tree with low bat roosting potential





Photograph 10: View north from Field 7



Photograph 11: Ditch to the west of Field 8



Photograph 12: Hedgerow between Fields 8 and 9



Photograph 13: Ditch to the west of Field 9





Photograph 14: Southern boundary of field 10



Photograph 15: View to the north of Field 10



Photograph 16: Target Note 6 in Field 11



Photograph 17: View north from Field 11





Photograph 18: View of hedgerow between Fields 12 and 13



Photograph 19: View of hedgerow and grass track to the northeast of Field 12 with Leake New Wood to the north





Photograph 20: Field 13, ditch along the northwest hedgerow on the Leake New Wood side



Photograph 21: New tree plantation to the south of Field 13





Photograph 22: Target Note 13, two ash trees with low bat roosting potential in Field 13



Photograph 23: View southwest from Field 13





Photograph 24: Hedgerow between Fields 13 and 14



Photograph 25: View north from Field 14



Photograph 26: View east across Field 15



Photograph 27: Hedgerow with trees from the centre of Field 15, facing northwest





Photograph 28: Ride between the northern hedgerow of Field 15 and Leake New Wood



Photograph 29: View of Target Note 7 from Field 15: ash and oak trees with low bat roosting potential



Photograph 30: View of Target Note 8 from field 15: ash tree with low bat roosting potential





Photograph 31: Northwest boundary of Field 16



Photograph 32: Cable Route through Leake New Wood





Photograph 33: Target Note 10: oak tree with low bat roosting potential next to cable route



Photograph 34: Target Note 17: ash tree with low bat roosting potential



## APPENDIX B: HSI ASSESSMENT RESULTS

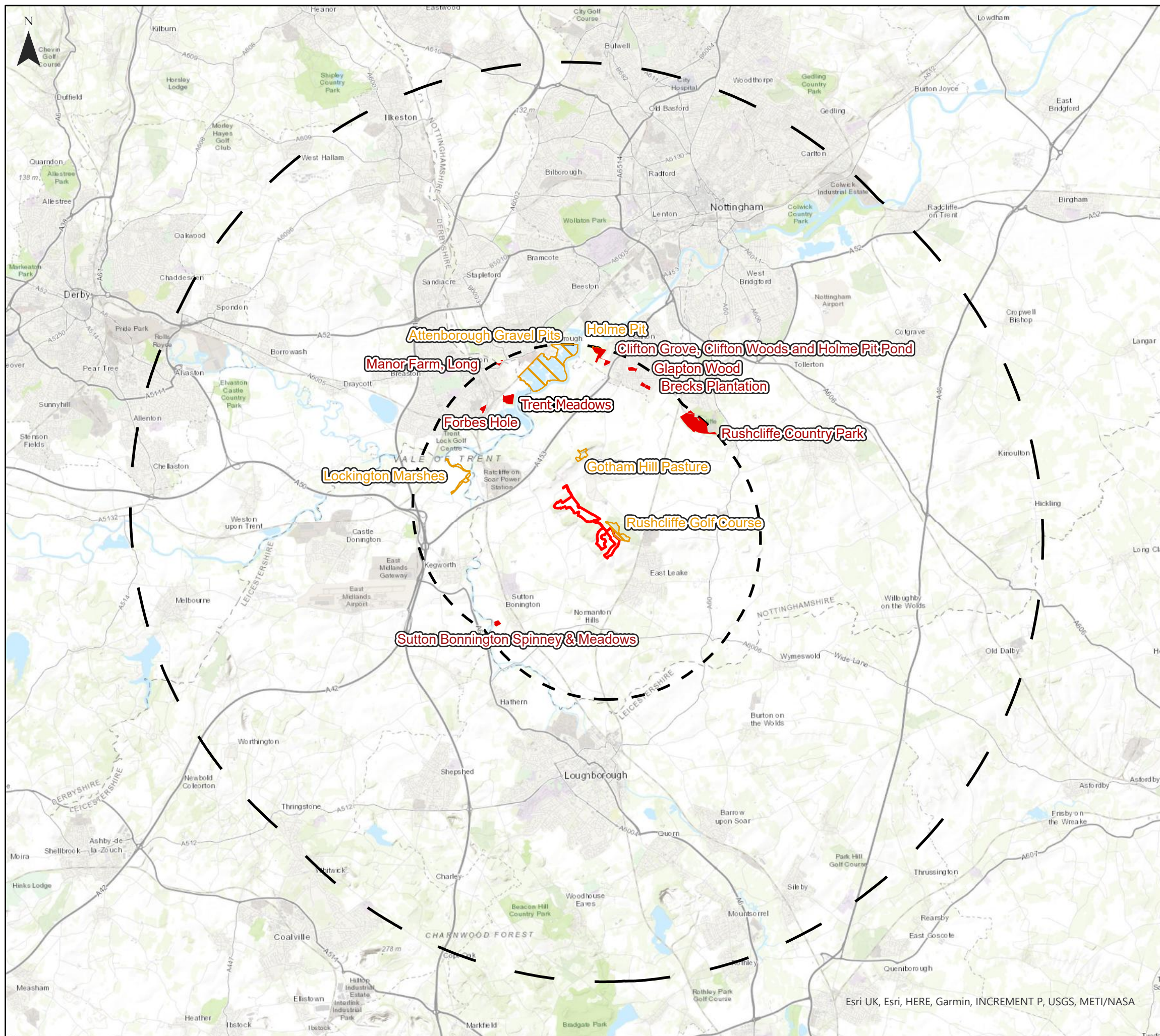
Table 1 GCN HSI Survey Results

POND ID	POND 2	POND 3
SI <sub>1</sub> LOCATION	Zone A (1.0)	Zone A (1.0)
SI <sub>2</sub> POND AREA	<50m <sup>2</sup> (0.05)	150m <sup>2</sup> 0.3
SI <sub>3</sub> POND DRYING	Annual (0.1)	Never (0.9)
SI <sub>4</sub> WATER QUALITY	Poor (0.33)	Moderate (0.67)
SI <sub>5</sub> SHADE*	≤60% (1)	≤60% (1)
SI <sub>6</sub> FOWL	Absent (1)	Absent (1)
SI <sub>7</sub> FISH	Absent (1)	Absent (1)
SI <sub>8</sub> POND COUNT	1 (0.39)	2 (0.55)
SI <sub>9</sub> TERRESTRIAL HABITAT	Moderate (0.67)	Moderate (0.67)
SI <sub>10</sub> MACROPHYTES*	60% (0.9)	10% (0.4)
Indicative Score**	0.46	0.70
Suitability for GCN	<b>Poor</b>	<b>Good</b>






\* Shade and macrophytes estimated in February – may be underestimated. \*\* Scores multiplied and tenth root taken.



# Kingston Solar Farm Statutory Environmental Designations Figure 2.1



## Key

-  Development Boundary
-  15km Study Area
-  5km Study Area
-  Site of Special Scientific Interest (SSSI)
-  Local Nature Reserve (LNR)

Neo Office Address:  
Cinnamon House, Crab Lane, Warrington, WA2 0XP



Esri UK, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA

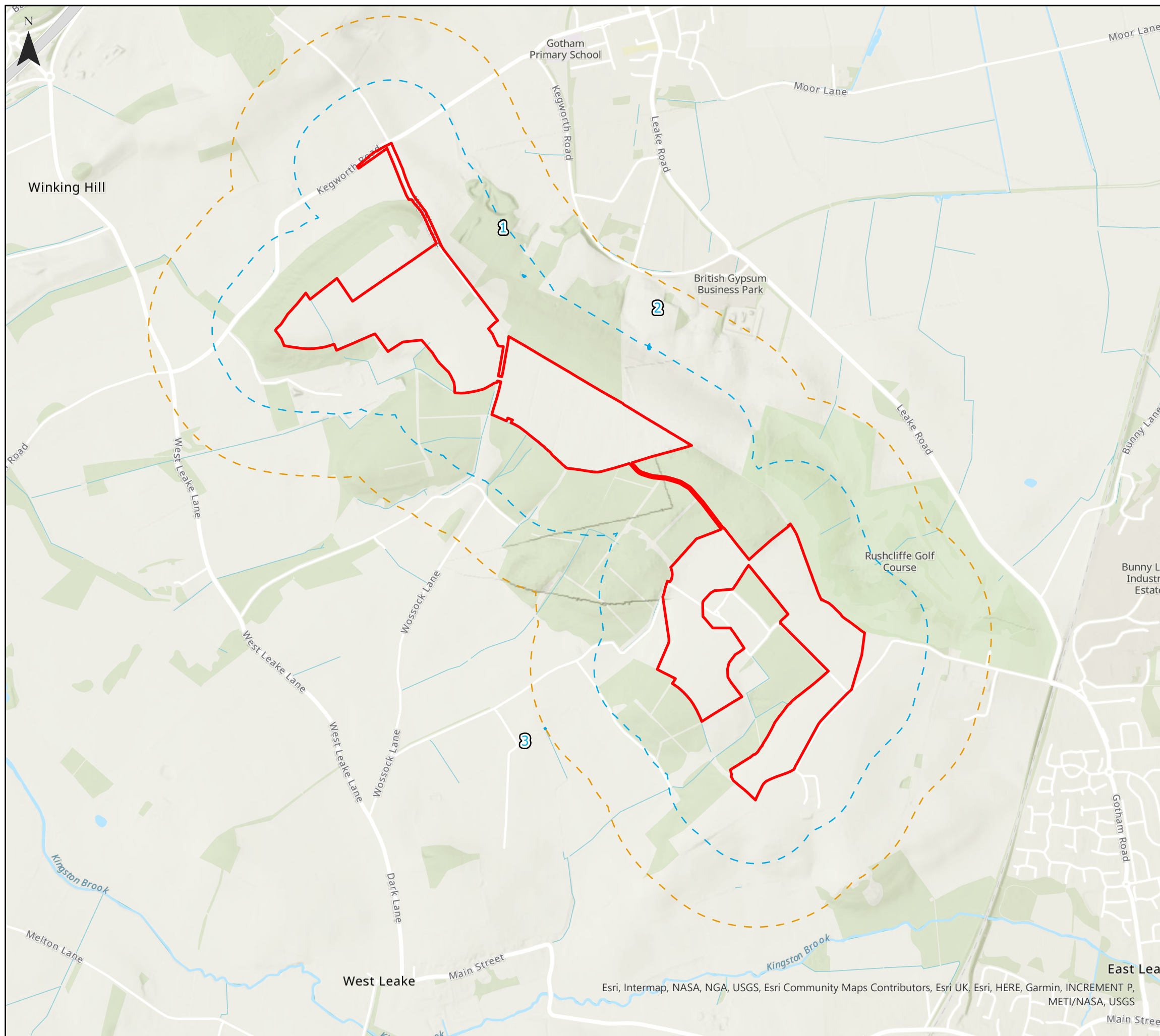
0 3.75 7.5 15 Kilometers

Date: 18/11/2021  
 Drawn By: Eiméar Rose Cunningham  
 Scale (A3): 1:135,000  
 Drawing No: NEO00763/005/C





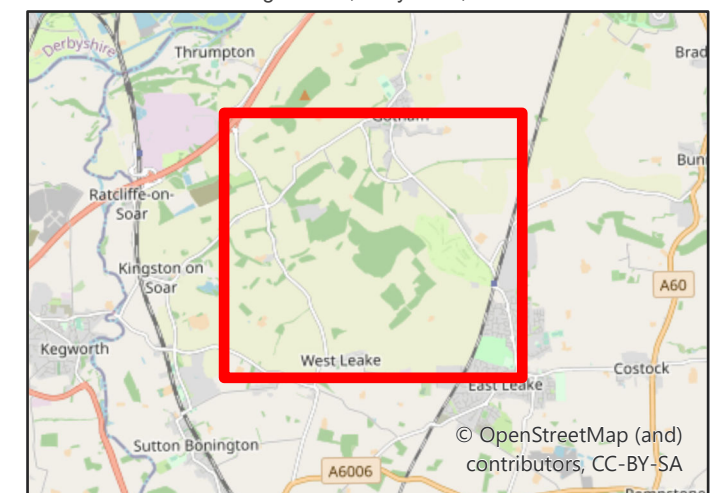
# Kingston Solar Farm Pond Map Figure 2.1.1



## Key

- Pond
- 250m Study Area
- 500m Study Area
- Development Boundary

Neo Office Address:  
83-85 Bridge Street, Ballymena, BT43 5EN



Esri, Intermap, NASA, NGA, USGS, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS

0 0.4 0.8 1.6 Kilometers

Date: 13/12/2021  
 Drawn By: Eiméar Rose Cunningham  
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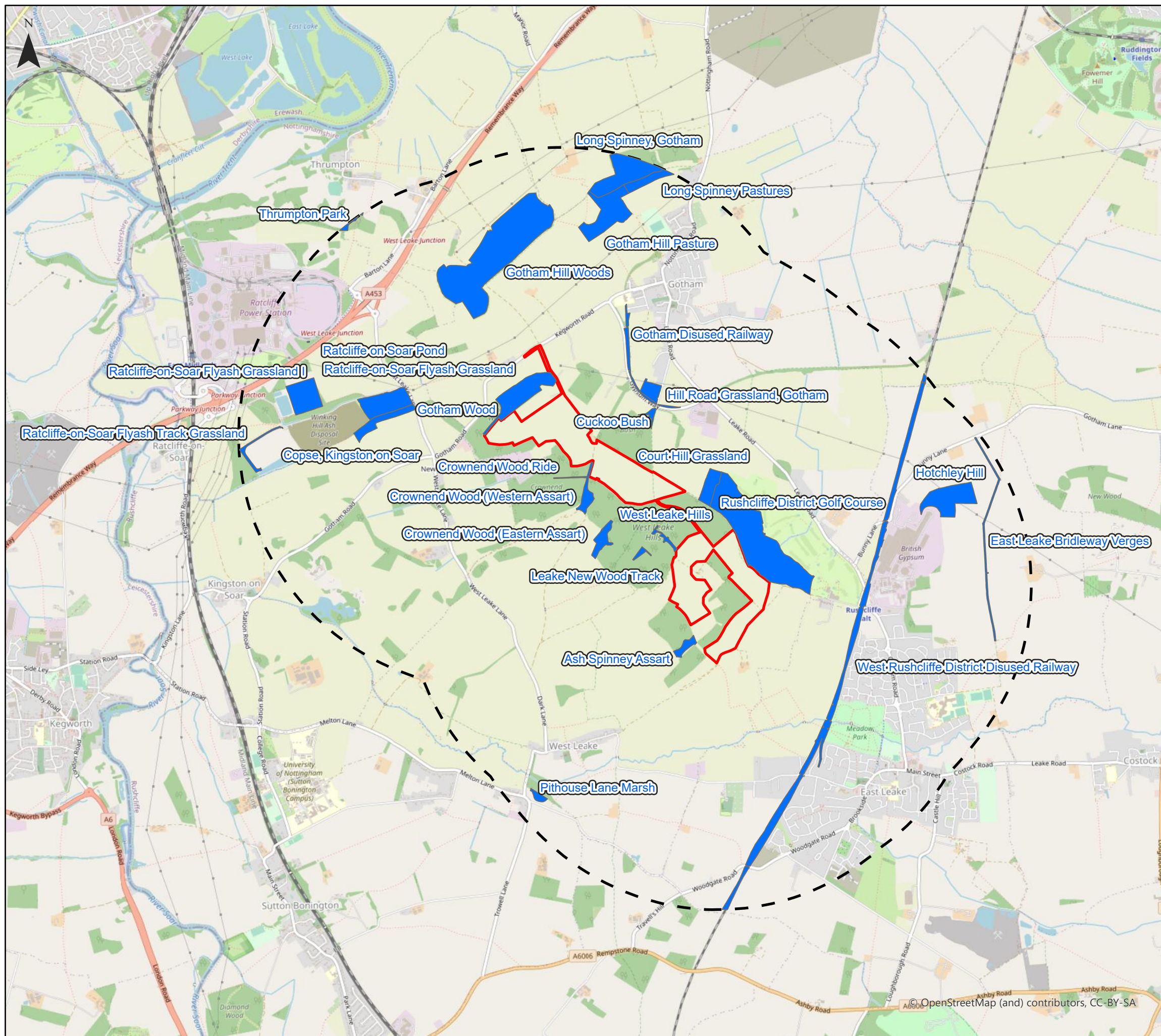




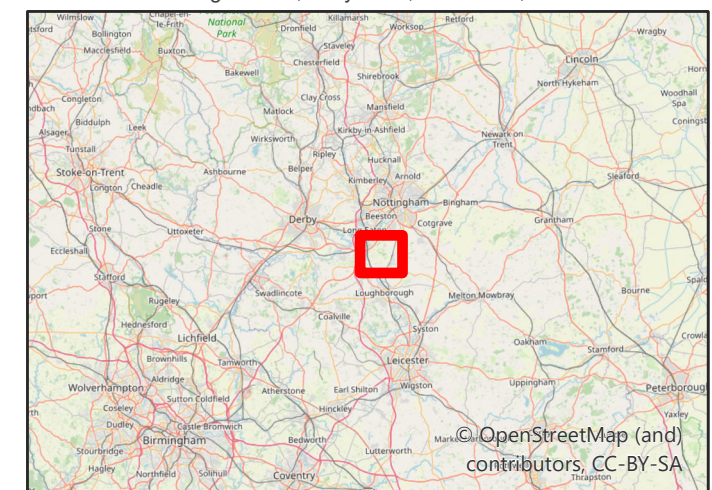
# Kingston Solar Farm Non-Statutory Environmental Designations Figure 2.2

Key

-  2km Non-Statutory Designations Study Area
-  Development Boundary
-  Local Wildlife Sites



Neo Office Address:  
83-85 Bridge Street, Ballymena, Co. Antrim, BT435EN



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Date: 24/11/2021  
Drawn By: Eiméar Rose Cunningham  
Scale (A3): 1:31,000  
Drawing No: NEO00763/0381/B

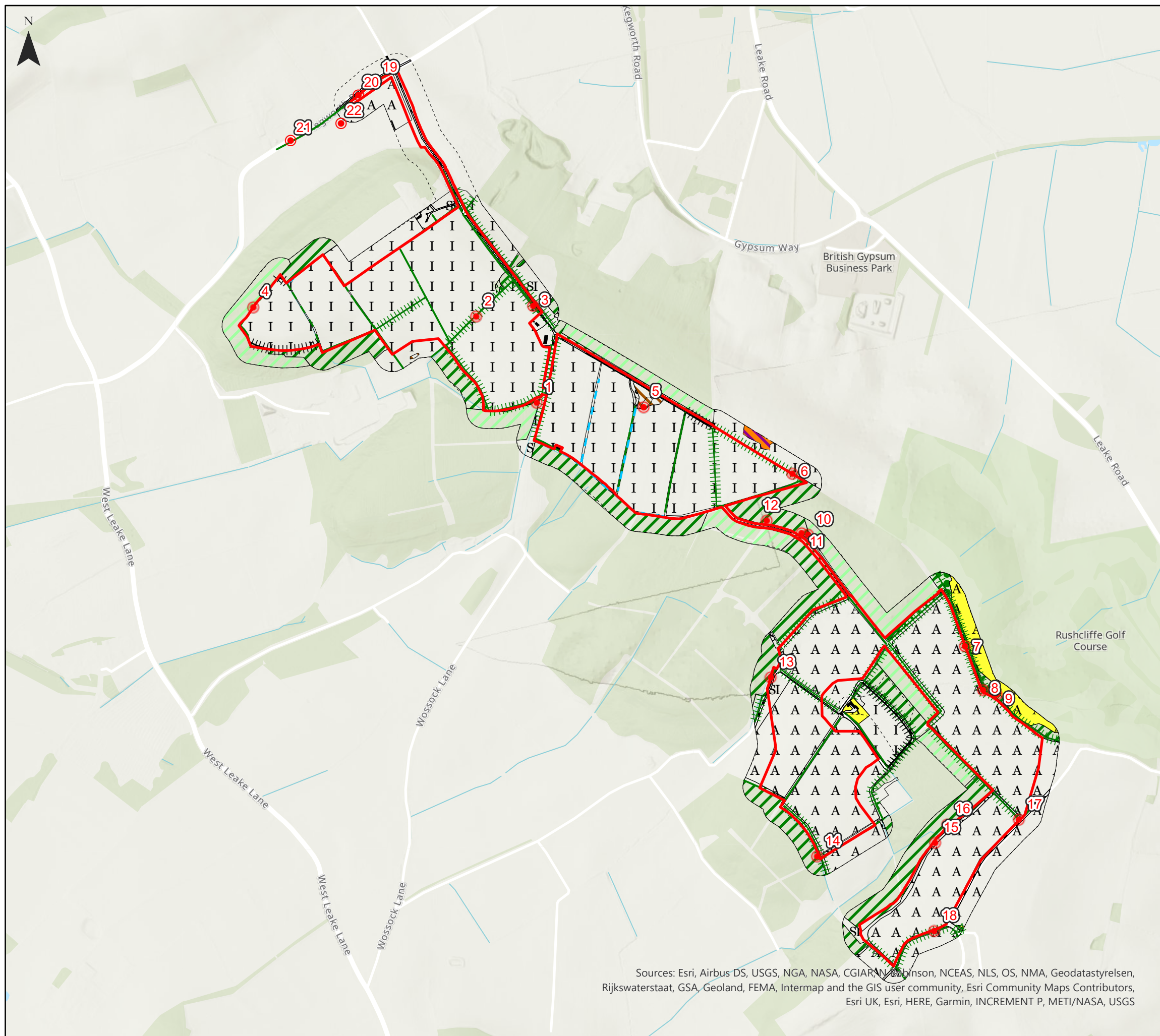


0 1.25 2.5 5 Kilometers

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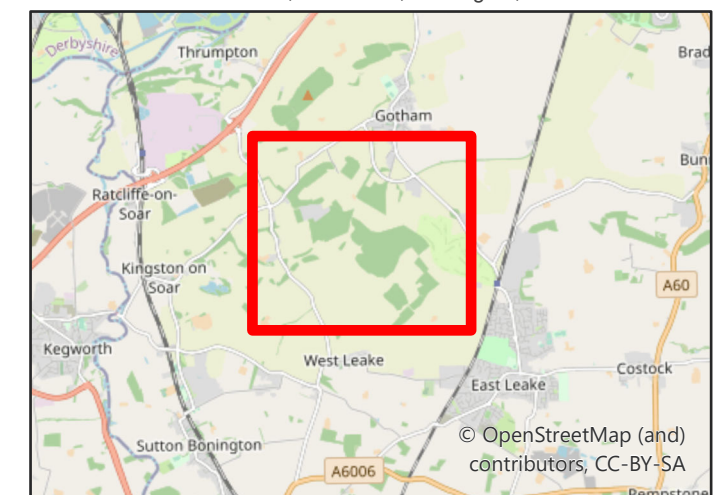
# Kingston Solar Farm Habitat Survey Map Figure 2.3



Key

Ecological Study Area (ESA)	J1.2 Amenity Grassland
Target Notes	J3.6 Buildings
A1.1.2 Broadleaved Plantation Woodland	J4 Bare Ground
A1.2.2 Coniferous Plantation Woodland	J5 Other Habitat (Garden)
A2.1 Dense Scrub	J2.1.2 Intact Hedge - Species-poor
A3.1 Broadleaved Parkland / Scattered Trees	J2.2.2 Defunct Hedge - Species-poor
B4 Improved Grassland	J2.3.2 Hedge with Trees - Species-poor
B5 Marshy Grassland	J2.4 Fence
B6 Poor Semi-improved Grassland	J2.6 Dry Ditch
C3.1 Tall Ruderal	Development Boundary
J1.1 Arable	

Neo Office Address:  
Cinnamon House, Crab Lane, Warrington, WA2 0XP



Sources: Esri, Airbus-DS, USGS, NGA, NASA, CGIAR, Nippon, NCEAS, NLS, OS, NMA, Geodastystyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap and the GIS user community, Esri Community Maps Contributors, Esri UK, Esri, HERE, Garmin, INCREMENT P, METI/NASA, USGS



Date: 08/12/2021  
Drawn By: Daniel Flenley  
Scale (A3): 1:11,000  
Drawing No: NEO00763/0391/C

