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Ecological Appraisal

Client

Caddick Developments Limited

Project

**Land at Junction 22 of the M1,
Cliffe Hill Farm**

Date

September 2025

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1.1 INTRODUCTION

- 1.2 The following report has been prepared by FPCR Environment & Design Ltd. for Caddick Developments Limited and provides details of an Ecological Appraisal undertaken at Land at Junction 22 of the M1 (Central OS Grid Ref: SK 48127 11534) herein referred to as the 'site'.

Site Context

- 1.3 The site is located immediately east of Junction 22 of the M1 motorway, encompassing Cliffe Hill Farm and White Hill Farm. The site comprised a series of grassland field compartments, predominantly grazed pasture, divided by native hedgerows with mature trees and some remnant sections of stone walls. A strip of Scots pine plantation woodland stands centrally within the site with a small area of broadleaved woodland that straddles Cottage Lane in the southeast of the site. A series of buildings associated with Cliffe Hill Farm were recorded in the south of the site.
- 1.4 With the exception of the M1 running along the western edge of the site and the A50 flanking the southern boundary the wider area surrounding the site is similar to that within the site; grassland divided by hedgerows with blocks of woodland. Quarries are a significant feature of the surrounding landscape.

Development Proposals

- 1.5 This report supports an Full Planning Application for industrial development of the site to create B2 and B8 type units with associated infrastructure. This would require substantial cut and fill earthworks to deliver the necessary levels. Access to the site would be achieved by entering from the A50 and exiting onto Whitwick Road to the east.

Subtitle Scope of Appraisal

- 1.6 This Ecological Appraisal describes the current ecological interest within and around the Site, which has been identified through standard desk- and field-based investigations. It then considers the potential ecological impacts and opportunities for ecological enhancement based on the Masterplan (UMC Drawing Ref 24473-UMC-ZZZZ-ZZ-DR-A-0601) and Landscape Strategy (FPCR Drawing Ref. DRG: 12507-FPCR-XX-XX-DR-L-0001, S3 Rev P17) in the context of relevant legislation and planning policy. Finally, it identifies the necessary additional measures to avoid, mitigate or provide compensation for potential impacts, and the mechanisms for securing such measures.

2.0 LEGISLATION & POLICY

2.1 The national policy and legislation most relevant here are:

2.2 National Planning Policy Framework (NPPF) (2024 (as amended Feb 2025));

- The Conservation of Habitats and Species Regulations ("The Habitats Regulations") (Amendment) 2017 in relation to the European Protected Species (EPS) great crested newt, (GCN), bats (all species) and dormouse; and European protected sites i.e. Special Areas of Conservation (SAC), Special Protection Areas (SPAs) and Internationally protected "Ramsar Sites" (collectively known as "Natura 2000 sites"). Annex II bat species of particular relevance in relation to SACs designated for bats.
- The Wildlife and Countryside Act 1981 (WCA) (as amended) in relation to all wild birds (including Schedule 1 species), other animals (notably Schedule 5 species), flora (those listed in Schedules 8 and 9) and Sites of Special Scientific Interest (SSSI);
- Natural Environmental and Rural Communities (NERC) Act 2006 in relation to various priority species and habitats;
- The Environment Act 2021;
- The Protection of Badgers Act 1992;
- The Hedgerow Regulations 1997;
- Local Nature Reserves (LNR) as designated most recently by the NERC Act 2006;
- Non-statutory protected local sites including County Wildlife Sites (CWS), Sites of Importance for Nature Conservation (SINC), Local Wildlife Sites (LWS) and Ancient Woodland Inventory (AWI) sites; and
- Local Biodiversity Action Plans (LBAP)

2.3 Local policy relevant to these proposals includes the Hinckley and Bosworth Local Plan (2020 – 2026) from which the Site Allocations and Development Management Policies (SADMP) DPD (2016) – Policy DM6: Enhancement of Biodiversity and Geological Interest & DM9 Safeguarding Natural and Semi-Natural Spaces are relevant. Also the Markfield Neighbourhood Plan 2020-2039 (MNP) (2021) – Policy M4: Ecology and Biodiversity is of relevance to this report.

3.0 SCOPING CONSULTATION

- 3.1 The scoping assessment for the Proposed Development was undertaken, response from which was received from the Ecology Officer at Leicestershire County Council on 30th July 2024. This response provided the following advice:

'The proposed development is sited on agricultural land and involves the removal of several hedgerows and mature trees.

As detailed in the Pre-application Planning Statement (Savills, July 2024) a Preliminary Ecological Appraisal (PEA) has been produced by FPCR (April 2024) which has recommended a number of further surveys that are being undertaken.

These will need to be provided prior to determination.

I would like to draw the applicant's attention to the south-eastern area of the site, which is a potential historic local wildlife site, and is adjacent to the roadside verge local wildlife site along the A50.

These should be taken into account, with appropriate buffers implemented along the roadside verge LWS, and appropriate survey effort of the potential historic LWS to assess its current condition.

As detailed in the Pre-application Planning Statement (Savills, July 2024), a BNG assessment has been undertaken by FPCR (June 2024).

The application will need to demonstrate a 10% net gain in Biodiversity as required by Schedule 7A of the Town and Country Planning Act 1990 (inserted by the Environment Act 2021). Prior to determination, the applicant should submit a completed Statutory Biodiversity Metric in excel format, along with the relevant condition assessments and pre and post-development plans.'

- 3.2 Further to this the formal Pre-application response received from Hinckley & Bosworth Borough Council (16th October 2024) states in relation to the sites position within the National Forest:

'When reviewing BNG metrics for development sites within the National Forest, they request that applicants are encouraged to apply the strategic significance multiplier for the woodland and forest, and individual trees broad habitat types. The designation of this area as the National Forest and the Defra-endorsed National Forest Strategy are considered by the NFC to be a 'local strategy' of sufficient standing to trigger the strategic significance multiplier. This should offer more protection to trees and woodlands and better reward developments that include these habitats in their landscaping proposals.'

- 3.3 In terms of ecology it also states the following:

'Policy DM6 of the SADMP states that development proposals must demonstrate how they conserve and enhance features of mature conservation and geological value. On site features should be retained, buffered and managed favourably to maintain their ecological value, connectivity and functionality in the long-term. The removal or damage of such features shall only be acceptable where it can be demonstrated the proposal will result in no net loss of biodiversity and where the integrity of local ecological networks can be secured. If the harm cannot be prevented, adequately mitigated against or appropriate compensation measures provided, planning permission will be refused.

Policy M4 of the MNP relates to ecology and biodiversity, the policy lists a number of sites which are identified for their biodiversity or geological significance. Developments should avoid harm to the significance of those sites, or as a last resort compensate for that harm. None of the listed sites are within the site itself, however, a number lie to the south of the A50. The development should ensure these assets are not harmed indirectly. In terms of trees policy M5 states that "To be supported development proposals that will result in the unavoidable loss of trees or hedgerows must include replacement planting of native species in locations where they would have the opportunity to grow to maturity, increase canopy cover and contribute to the local ecosystem and the appearance of the area".'

- 3.4 The response also acknowledges that the site falls within the SSSI Impact Risk Zone of Ulverscroft Valley and Cliffe Hill Quarry SSSIs.

4.0 METHODOLOGY

- 4.1 In order to compile existing baseline information, relevant ecological information was requested from both statutory and non-statutory nature conservation organisations including:
- Multi Agency Geographic Information for the Countryside (MAGIC)¹; and
 - Leicestershire and Rutland Environmental Records Centre (LRERC)
- 4.2 Further inspection of colour 1:25,000 OS base maps (www.ordnancesurvey.co.uk) and aerial photographs from Google Earth (www.maps.google.co.uk) was also undertaken in order to provide additional context and identify any features of potential importance for nature conservation in the wider countryside.
- 4.3 The search area for biodiversity information was related to the significance of sites and species and potential zones of influence, as follows:
- 10km around the application area for sites of International Importance (e.g. Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites).
 - 2km around the application area for sites of National or Regional Importance (e.g. Sites of Special Scientific Interest (SSSIs)) and species records (e.g. protected, Local Biodiversity Action Plan (LBAP) or notable species).
 - 1km around the application site for sites of County Importance (e.g. Local Wildlife Sites).
- 4.4 When reporting consultation data, records were filtered to include only those from 2004 onwards however, professional judgement has also been used and older records included where deemed appropriate to the overall assessment.

Extended Phase 1 Habitat Survey

- 4.5 A field survey was conducted on 4th April 2024 by a suitably experienced ecologist with a level four Field Identification Skills Certificate (FISC) certificate. Survey methods followed the extended Phase 1 Survey (JNCC, 2010²) technique. This involved a systematic walkover of the site to classify the broad habitat types and identify any Habitats of Principal Importance (HPI) for the conservation of biodiversity as listed within Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006. Habitats were broadly mapped in the field using an OS base map.
- 4.6 Where feasible, target notes and species lists were compiled for individual areas and assessments of abundance were made using the DAFOR scale. Vascular plant nomenclature follows Stace (2019)³. Whilst the species lists collected should not be regarded as exhaustive, sufficient information was gained during the survey to enable classification and assessment of broad habitat types and identify features likely to be of interest.
- 4.7 Additionally, habitats have been defined under UK Habitat Classification in accordance with the Statutory Biodiversity Metric User Guide provided by Natural England⁴. Habitat Condition

¹ magic.defra.gov.uk

² JNCC (2010). Handbook for Phase 1 habitat survey – a technique for environmental audit. Peterborough: JNCC

³ Stace, C.A. (2019). New Flora of the British Isles. (4th Ed.). Cambridge: Cambridge University Press

⁴ Natural England (2023) Statutory Biodiversity Metric[Online] Available at <https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides>

Assessments were based on the technical supplement provided for the Natural England Biodiversity Metric 4.0 which provides guidance on data collection and condition assessment to support the use of the metric. This data will be used to quantify the predicted net-change in biodiversity value ("biodiversity units") of a proposed development site before and after development. Results of this assessment are presented separately and not discussed further within this report.

Invasive Plants, Notifiable Weed Species and Other Notable Flora

- 4.8 Consideration was given as to the presence of invasive species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) (WCA 1981)⁵ and the presence of any notable weeds including those covered under the Weed Act 1959⁶ (where population is significant enough to be considered injurious).

Other Neutral Grassland Quadrat Surveys

- 4.9 During the Desk Study it was acknowledged that the area of the site at its eastern extent of the site was noted as a Historical LWS. The extended Phase 1 Habitat Survey identified areas of Other Neutral Grassland within the mapped Historical LWS within the site. As such, quadrat surveys of three field compartments were completed in August 2024 to confirm their condition assessment for the purpose of appropriate categorisation within the BNG assessment as well as provide sufficient data to enable assessment against the Leicestershire Local Wildlife Site criteria.
- 4.10 Quadrat surveys were undertaken in three fields, F1, F2 and F3 (refer to Figure 4) with 5, 6 and 5 quadrats completed respectively in each field. Quadrats measuring 1m x 1m were used, avoiding any of the atypical parts of the sward (eg. edge habitat). The number of quadrats was proportional to the area sizes. The location of each quadrat was then recorded using hand-held GPS units. Species within each quadrat were recorded along with the percentage cover, along with other species noted within the sward but not recorded within the quadrats themselves. Based on the data collected, an assessment against the Leicestershire Local Wildlife Site criteria was made species from lists F. It is not confirmed if these fields are usually seasonally flooded so data was also consideration against list G.

Fauna

Badger

- 4.11 All hedgerows and other suitable habitats within the Site were searched for evidence of badger *Meles meles* activity. Methodology employed followed that outlined by Harris and Creswell and Jefferies⁷.
- 4.12 Evidence of badger occupation and activity sought 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;

⁵ Act of Parliament, (1981). The Wildlife and Countryside Act 1981 (as amended), London: HMSO.

⁶ Act of Parliament. (1959). The Weed Act 1959. London: HMSO.

⁷ Harris, S., Cresswell, P. & Jefferies, D. 1989. *Surveying for Badgers*. Occasional Publication of the Mammal Society No.9. Mammal Society, Bristol.

- Prints and paths or trackways;
- Hairs caught on rough wood or fencing; and
- Other evidence: including snuffle holes, feeding and playing areas and scratching posts.

Great Crested Newt

- 4.13 As part of the Phase 1 habitat survey any waterbodies within a 500m radius were identified using OS maps and aerial satellite imagery as shown on Figure 3.

eDNA Survey

- 4.14 Environmental DNA (eDNA) sampling was undertaken of offsite P1 in the 2024 survey season to determine the presence/absence of GCN in accordance with the Technical Advice Note for field and laboratory sampling of GCN eDNA (WC1067)⁸. This methodology has been approved by Natural England for the determination of GCN presence/absence.
- 4.15 Sampling was undertaken by appropriately licenced ecologists who collected a sample of water from the pond (during suitable weather conditions avoiding heavy rain). Sampling was undertaken using kits obtained from ADAS. The methodology comprised taking samples of agitated water from 20 locations around each pond and mixing thoroughly. 15ml of this water was then placed into each of the six sterile sample tubes containing preservative, precipitates and a DNA sequence that was used for degradation control. All samples were stored in accordance with the protocols provided by the laboratory. The samples were then transported under suitable conditions for analysis. Following analysis, results provided by the laboratory could have one of three outcomes described in Table 1 below.

Table 1: Description of Possible Results of eDNA Analysis

Result	Description
Positive	A positive result means that eDNA from GCN was detected and they have been present within the water in the 20 days preceding sampling. An eDNA score would be provided indicating the number of positive replicates from a series of twelve.
Negative	DNA from GCN was not detected; in the case of negative samples the DNA extract is further tested for PCR inhibitors and degradation of the sample.
Inconclusive	Controls indicate degradation or inhibition of the sample, therefore the lack of detection of GCN DNA is not conclusive evidence for determining the absence of the species in the sample provided. Degradation can occur through poor storage of the samples or kits and inhibition can occur through unexpected chemicals in the sample.

Reptiles

- 4.16 Habitats present within the Site were considered for their potential suitability to support reptile populations, including the presence of features which provide opportunities for reptiles to bask, forage and/or hibernate, and areas of varied vegetation structure in sheltered locations with sunny aspects and connectivity to other suitable reptile habitats.
- 4.17 A strategic reptile presence/absence survey was undertaken within all onsite habitat offering potential to support reptiles. The survey was undertaken based on methodology detailed in the

⁸ Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford.

Herpetofauna Workers Manual⁹ and the Froglife Advice Sheet¹⁰. The Site was subject to reptile surveys which are discussed in a separate Reptile Report (FPCR, September 2024). Methods involved a search for basking reptiles on/under naturally occurring and strategically positioned artificial refugia. These were placed in locations that offered the most suitable habitat for common reptiles, i.e. structurally diverse grassland habitats with areas of bare ground/short vegetation. A total of 125 refugia were placed within the survey area, and the indicative location of these refugia is shown in Figure 5.

- 4.18 All of the surveys were undertaken by suitably experienced FPCR ecologists. The prevailing weather conditions, including relative wind speed, cloud cover, ambient temperature and any other notable weather, are provided in Table 2.

Table 2: Reptile Survey Date and Weather Conditions

Survey	Date	Start Time	Temp °C	Weather
1	02.07.24	9:00	15	50-60% cloud, 1-2 wind, bright no rain.
2	05.07.22	9:00	14	80-90% cloud, 1-2 wind, bright no rain.
3	12.07.24	10:00	14	50-60% cloud, 1-2 wind, bright no rain.
4	17.07.24	11:00	18	30-40% cloud, no wind, bright no rain.
5	24.07.24	15:40	22	70-80% cloud, 1-2 wind, bright no rain.
6	30.07.24	7:00	16	10-20% cloud, 1-2 wind, bright no rain
7	02.08.24	8:00	17	10-20% cloud, 1-2 wind, bright no rain

- 4.19 In addition, the surveys also followed the guidelines recommendations by:
- Using regularly spaced roofing felt (0.5m²) as artificial refugia, with a black upper side;
 - Approaching refugia from downwind and avoiding casting a shadow and with care so as to not disturb basking animals when checking; and
 - That lifting and replacing tins, to check for the presence of reptiles underneath in hot weather is undertaken with care, to avoid potential harm to any animals underneath.

Bats

- 4.20 The Site was subject to a range of bat surveys which are discussed in a separate Bat Report (FPCR, June 2025).

Birds

- 4.21 The Site was subject to surveys for breeding birds. This is discussed in a separate Bird Report (FPCR, May 2025).

Limitations

- 4.22 Due to the usage of parts of the site for grazing by bull and cows with calves, it was not safe or agreeable with the farmer to position reptile refugia, nor to undertake bat activity surveys in those grazed field compartments, which reduced the extent of coverage. Survey effort was sufficient in all other fields, which were of similar habitat type and connectivity, such that it was concluded that fauna present within the area of the site where survey could not be undertaken, that sufficient evidence of presence / absence would be identified in the

⁹ Gent, A.H. & Gibson, S.D., eds., 1998. *Herpetofauna Workers' Manual*. Peterborough, Joint Nature Conservation Committee.

¹⁰ Froglife, 1999. Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. *Froglife Advice Sheet 10*. Froglife, Halesworth.

surrounding linked habitats. As such, the distribution of survey effort was not considered to be a significant limitation to the conclusions.

5.0 RESULTS

Desk Study

Designated Sites

- 5.1 Results of the desk study are shown on Figure 1a: Consultation Plan – Sites. No statutory designated sites were located within or adjacent to the site.

Statutory Designated Sites

- 5.2 No statutory designated sites of international importance recorded within 10km of the site boundary, the nearest was the River Mease SAC 12km east of the site.
- 5.3 There were two statutory designated sites of nature conservation importance at a national level recorded within 2km of the site boundary, both SSSIs as described further below at Table 3. Both of these sites are also recognised as RIGS of geological importance at a national level. Billa Barra Hill LNR
- 5.4 Table 3: Statutory Designated Sites

Site Name	Designation	Description	Proximity
Cliffe Hill Quarry	SSSI / RIGS	Citation provides geological description.	550m
Ulverscroft Valley	SSSI / RIGS	Unimproved neutral and acid grassland, heath, woodland and wetlands in combination providing one of the best wildlife sites in Leicestershire. Over 200 plant species including county rarities recorded as well as mammals, insects and birds of note.	920m
Billa Barra Hill	LNR	The lower slopes have been planted with a mix of locally sourced trees typical of this type of acidic soil. The hill top is ecologically interesting, with areas of acid grassland and an old conifer plantation. The pools in the abandoned quarry support a variety of species, including a rare lichen.	1.1km

Non-Statutory Designated Sites

- 5.5 Twenty other non-statutory designated sites were located within 1km of the site boundary, all of which were LWSs. Details of these sites are provided in Table 4. A LWS sits directly adjacent to the southern boundary of the site; Markfield Roadside Verge #3.

Table 4: Non-Statutory Designated Sites

Site Name	Designation	Description	Proximity
Markfield Roadside Verge 1&2&3	LWS	Mesotrophic Grassland.	Adjacent
Altar Stones	LWS	Acid Grassland	40m
Field S of Ulverscroft Wood	LWS	Mesotrophic grassland	150m
Raunsliffe	LWS	Acid grassland	215m
Ulverscroft Wood	LWS	Ancient semi-natural woodland	225m
Coalbourn Wood	LWS	Ancient semi-natural woodland	300m
Land Adjacent to Raunsliffe Farm	LWS	Mesotrophic Woodland	310m
Land Adjacent to Cricket Club	LWS	Acid Grassland	425m
Hill Hole Meadow	LWS	Mesotrophic Grassland	550m
Hill Hole Quarry	LWS	Acid Grassland	625m
Old Stone	LWS	Mesotrophic Grassland	630m
Home Farm	LWS	Mesotrophic grassland	685m
Field N of Leicester Rd	LWS	Mesotrophic grassland	720m
Highfield Meadow 2	LWS	Mesotrophic grassland	730m
Highfield	LWS	Mesotrophic grassland	745m
Grassland by Stoney Fm	LWS	Mesotrophic grassland	810m
Copt Oak Farm	LWS	Mesotrophic grassland	810m
Chitterman Hill Wood	LWS	Ancient semi-natural woodland	825m
Copt Oak Wood Fields	LWS	Ancient semi-natural woodland	875m
Veteran Horse Chestnut off Main St	LWS	Mature Tree	950m

- 5.6 In addition to the above, a variety of Historical Sites were noted and are displayed at Figure 1a. One of these overlaps with the southeastern extent of the site and was noted as scrub habitat in the 1980s/90s. No further information on historic sites is known.

Protected/Notable Species

- 5.7 Several protected or notable species records from recent years surrounding the site were provided by LRERC. None of these records fell within the site boundary.
- 5.8 Records of common frog *Rana temporaria* and common toad *Bufo bufo* occur next to the eastern boundary of the site. No GCN records were returned within 1km of the site.
- 5.9 Six records of common lizard *Zootoca vivipara* were returned within 1km of the site in the past 20 years, two of which corresponded to a specific compartment within the Ulverscroft SSSI from 2009. Others were various locations, the nearest of which was 270m south of the site on the opposite side of the A50 in the Altar Stones LWS, which was a dead lizard. No other species of reptile were recorded within 1km of the site.
- 5.10 Just beyond the eastern edge of the site records of bats, predominantly common pipistrelle were noted. Many records of a range of bat species were reported from the surrounding area. These all represented survey effort rather than a notable abundance of bats, being in flight records recorded as field observations or from static detector recordings with the exception of two individual roost records that arose from bat box checks in the Ulverscroft Valley SSSI. No other roost records were known of.
- 5.11 Several records of badger *Meles meles* were returned, many of which represented setts, though some were records of badger droppings or dead badger.

- 5.12 Several records of hedgehog *Erinaceus europaeus* were returned at various locations in the wider area. A record of otter *Lutra lutra* was reported from 2015 along a tributary of the River Lin 570m east of the site. No water vole records were returned. Some records of Sika deer *Cervus nippon* and Muntjac *Muntiacus reevesi* were noted in the wider area.
- 5.13 Numerous bird records were provided that corresponded to location outside of the site in the wider area, including barn owl *Tyto alba*, a WCA1 species as well as Linnet *Linaria cannabina*, starling *Sturnus vulgaris* and song thrush *Turdus philomelos*, all red listed species.

Extended Phase 1 Habitat Survey – Habitats

- 5.14 The locations of the habitats described below are illustrated in Figure 2: Baseline Habitat Plan. Botanical species lists are provided in Appendix A.
- 5.15 The majority of the site comprised improved / modified grassland with three field compartments categorising as semi-improved / other neutral grassland in the east of the site. Fields were mostly divided by native hedgerows with mature trees with some remnant sections of stone walls. A strip of Scots pine plantation woodland stood centrally within the site with a small area of broadleaved woodland which straddled Cottage Lane in the southeast of the site. A series of buildings associated with Cliffe Hill Farm were recorded in the south of the site.

Improved / Modified Grassland

- 5.16 Across much of the site, improved / modified grassland habitat was recorded and comprised frequent perennial rye grass *Lolium perenne* and creeping bent *Agrostis stolonifera*, with occasional Yorkshire fog *Holcus lanatus* and creeping buttercup *Ranunculus repens*. Herbs were otherwise rarely occurring but species including broad leaved dock *Rumex obtusifolius*, dandelion *Taraxicum officinale*, common vetch *Vicia sativa*, common mouse-ear *Cerastium fontanum*, chickweed *Stellaria media* and common sorrel *Rumex acetosa* were recorded as present.
- 5.17 This habitat was a continuous closed sward that was managed through grazing. Ground conditions were very wet at the time of survey and as such there was a greater extent of bare / disturbed ground due to poaching and tracking of machinery, particularly in the south of the site.



Photograph 1: Typical Improved / Modified grassland in the north of the site.

Semi Improved / Other Neutral Grassland

- 5.18 Three field compartments in the southeast of the site were classified as semi-improved / other neutral grassland as a greater species diversity was recorded. Particularly the two fields to the east of Cottage Lane were noted to comprise frequent common bent and tufted hair grass *Deschampsia cespitosa*, also including occasional Yorkshire fog, meadow buttercup *Ranunculus acris*, sheep's fescue *Festuca ovina*, marsh thistle *Cirsium palustre*, common sorrel and soft rush *Juncus effusus*, and rarely occurring common knapweed *Centaurea nigra*, birds foot trefoil *Lotus corniculatus*, meadow vetchling *Lathyrus pratensis*, greater burnet *Sanguisorba officinalis*, sweet vernal grass *Anthoxanthum odoratum*, sedge sp. *Carex* sp. and wild angelica *Angelica sylvestris*.
- 5.19 This grassland presented some species commonly associated with National Vegetation Classification MG5 grassland, though was surveyed early in the season (early April) and additional survey was recommended. More detailed quadrat survey of these fields was conducted in August 2024 to fully analyse the categorisation of these field parcels. Details of these surveys is presented at Appendix B.

**Photograph 2: Semi-improved / other neutral grassland in the south east of the site.**

- 5.20 The species presence and abundance recorded within these fields was assessed against the Leicestershire Local Wildlife Site criteria for mesotrophic grassland, where by at least 7 species from 'List F' should be Occasional, Frequent, Abundant or Dominant in the sward OR at least 10 species from the grassland 'List F' should be present. Within field F1, 9 species from List F were present, 4 of which were at least Occasionally occurring. Within field F2, again 9 species from List F were present, 4 of which were at least Occasionally occurring. Within field F3, 8 species from List F were present, 1 of which was at least Occasionally occurring.
- 5.21 Therefore based on the data presented at Appendix B, the two field compartments to the east of Cottage Lane almost meet the minimum threshold for LWS qualification but marginally fall short by presence of 1 species from List F.

Tall Herb / Ruderal Vegetation

- 5.22 A small area of tall herb / ruderal vegetation was recorded adjacent to the CliffeHill Farm buildings. This was an area with piles of muck, rubble, timber, roof tiles and hay bales with disturbed ground that was partially colonised by nettles *Urtica dioica* with occasional creeping thistle *Cirsium arvense*.

Scrub

- 5.23 Several areas were mapped as scrub. These were sections of outgrown hedgerows which had spread to a width >5m. Scrub denoted as S1 (Figure 2) was relatively mixed in composition, including holly *Ilex aquifolium*, hawthorn *Crataegus monogyna*, oak *Quercus robur*, elder *Sambucus minor* and willow *Salix* sp.. Sections of scrub denoted as S3 and S4 mostly comprised suckering blackthorn *Prunus spinosa* with bramble *Rubus fruticosus* agg.. Scrub denoted as S5 was a mature line of dense mixed scrub with mature oak trees that formed a broad woody habitat.

Woodland

- 5.24 A belt of Scots pine plantation stood centrally within the site. The western portion of the site woodland (W1) was unmanaged with closely spaced pine trees amongst which occasional broadleaf trees were also present including oak and beech *Fagus sylvatica* with an understorey of elder and holly. Patches of bramble and fallen deadwood branches were frequent with localised patches of grassy ground flora including bluebells *Hyacinthoides* sp. were recorded.
- 5.25 The eastern portion of the woodland (W2) comprised pines which were more variable in their spacing creating some openings. There was no understorey with a grassy leaf littered ground layer.
- 5.26 In the east of the site an area of other broadleaved woodland was recorded. This comprised tree lines of mature oak and holly either side of Cottage Lane and a triangle of woodland which was accessible to sheep which frequently used it to shelter. As such the ground layer was sparse comprising largely bare ground with patches of nettle and bramble. Trees including silver birch *Betula pendula* and rowan *Sorbus aucuparia* with mature holly and hazel.

Trees

- 5.27 Many mature trees were recorded across the site. Outside of the Scots pine woodland plantation, all other trees were broadleaved species, predominantly oak. Overall, trees were in good health, though several mature oak demonstrated splits and failed limbs typical of their age and species. Where dead wood was present, branch socket cavities and cracks presented small features potentially suitable for small numbers of roosting bats.
- 5.28 Two trees, T31 next to the exit track from Cliffe Hill Farm and T1 at the end of hedge H2 were noted to present features potentially associated with future veteran specimens.

**Photograph 3: Tree T1****Photograph 4: Tree T31****Hedgerows**

- 5.29 Hedges across the site were native species dominant, therefore all qualify as UK BAP Priority Habitats. Twenty one hedgerows were recorded, some of which contained at least 5 species. Hedgerows comprised species including hawthorn, elder, field maple *Acer campestre*, holly, blackthorn and hazel *Corylus avellana* with mature trees that were predominantly oak. Generally the hedges in the south and east were less managed creating taller, broader features with those in the north under more rigorous management resulting in shorter, dense hedgerows with more defined individual trees. Several hedgerows contained slightly more species and therefore were considered species rich; H3, H13, H14, H16, H17 and H19).

Ditches

- 5.30 Several ditches were recorded across the site, mostly associated with hedgerow bases. These were generally 1m – 1.5m wide and <0.75m from base to bank top with gently sloped soft banks. Some of the ditches centrally within the site had some steeper banks with partial stone wall banks where they edged the plantation woodland. None of the ditches held >10cm depth of water at the time of survey despite the wet ground conditions at the time and were concluded likely to be dry for much of the year in 'normal' conditions. Ditches associated with hedgerows contained leaf litter and branch debris but negligible aquatic vegetation due to shading. The open ditch in the south of the site was waterlogged at its base but did not contain a depth of water, however contained foals water-cress *Apium nodifolium*, floating sweet grass *Glyceria fluitans*, creeping buttercup and soft rush.
- 5.31 No ponds were recorded within the site.

Invasive Species

- 5.32 No invasive species were recorded during the survey.

Buildings

- 5.33 A single storey, brick-built house with pitched tiled roof was recorded in the south of the site. The residences roof was in good repair with flashing around the two chimneys and wooden soffits and fascias and double-glazed windows and doors.

- 5.34 A series of single-story brick-built stables and storage sheds with corrugated metal sheet and asbestos sheet roofs were also recorded in the farmyard in the south of the site as well as two adjoining concrete frame and breeze block open sided barns.



Photograph 5: Frontage of property at Cliffe Hill Farm

Photograph 6: Barn in Cliffe Hill Farm yard

Other

- 5.35 A manège was present immediate north of Cliffe Hill farmyard. Hard standing was recorded within Cliffe Hill farmyard as well as a portion of White Hill Farmyard in the far north of the site.

Fauna

Badger – **Confidential – Badger Report available to relevant consultees only.**

Great Crested Newt

- 5.36 No ponds occur within the site. The intensive management of the site limits potential terrestrial habitat for this species to hedge and tree bases, woodlands and scrub. Natural England's Magic website does not indicate any records of GCN mitigation licences within 1km of this site. No records of GCN have been identified within 1km of the site through consultation with LRERC.
- 5.37 The nearest pond identified from maps and aerial imagery is 250m east of the site within the grounds of Borrowdale Gates on the other side of Whitwick Road. No other ponds have been identified within 500m of the site that are not separated by a significant barrier to dispersal for amphibians.
- 5.38 eDNA of the one offsite pond within the grounds of Borrowdale Gates was conducted on 4th June 2024 which returned a negative result, confirming the likely absence of GCN locally. Results of this are provided at Appendix C.

Reptile

- 5.39 Due to the homogenous grazed modified grassland overall the site was considered to offer limited suitability for reptiles though some basking, foraging, shelter and breeding opportunities were present at field edges, associated with stone walls, ditches and hedgerow bases. Full reptile surveys were conducted and no reptiles were recorded during any of the seven survey occasions nor any anecdotal sightings reported during any of the other ecological

surveys conducted or observed by the land tenant. It is therefore considered likely that reptiles are not present.

Bats

- 5.40 Results of a range of bat surveys conducted during the 2024 season are presented in a separate Bat Report (FPCR, June 2025).

Birds

- 5.41 Results of four breeding bird surveys conducted in 2024 are presented in a separate Bird Report (FPCR, May 2025).

Other Fauna

- 5.42 The site offers suitable foraging habitat for hedgehog, with records for the species identified during the Desk Study in the wider area. The hedges, scrub and tree lines at field boundaries with an abundance of leaf litter from deciduous trees and shrubs has the potential to be used by the species for hibernation.

6.0 DISCUSSION & CONCLUSIONS

Statutory Designated Sites

- 6.1 No statutory designated sites of international importance recorded within 10km of the site boundary. There were two statutory designated sites of nature conservation importance at a national level recorded within 2km of the site boundary; Cliffe Hill Quarry SSSI and Ulverscroft Valley SSSI at 550m and 920m from the site (Refer to Figure 1a). The site occurs within the Risk Impact Zones of these sites and the proposals may entail the following 3 types of development which trigger the LPA to consult Natural England:
- Infrastructure: Any transport proposal including new or extended footways, cycleways, roads/car parks, railways and waterways.
 - Rural Non-residential: Large non-residential developments outside of existing settlements/urban areas where the footprint exceeds 1ha.
 - Water Supply: Large infrastructure such as warehousing/industry where the total net additional gross internal floorspace following development is 1,000m² or more.
- 6.2 However, the context of this development adjacent to the M1 and A50 with direct links straight onto this existing network, the vast majority of the traffic from the site would be utilising these roads which do not run within 200m of any part of these SSSI. Also, given the existing flows on these roads, the estimated trips generated by the proposals onto this infrastructure would be a minor proportion of the existing. Any traffic impact upon the small lanes that occur within 200m of these SSSI is likely to be negligible. Any potential risk from the infrastructure in terms of air quality is not considered to pose a significant impact on the designated sites in terms of air quality. Likewise, any ecological interest at Billa Barra Hill LNR is over 150m from the nearest road network, screened by woodland and again traffic impact upon this road from the proposals are not anticipated to be significant such that ecological interest could be effected.
- 6.3 In terms of water supply, Cliffe Hill Quarry is upstream and in a different catchment to the Site. Ulverscroft Valley SSSI is also predominantly in a different catchment apart from a small section which is c. 1.8km east of the site. On this basis, the Site and the designated sites are not functionally linked and any potential risk of changes in water supply to the SSSIs is not considered to pose a significant impact.
- 6.4 Groby Pools and Woods SSSI is over 4km south east of the site, however, due to its location abutting the A50, assessed in reference to IAQM *A guide to the assessment of air quality impacts on designated nature conservation sites* was undertaken. Modelling has confirmed that trip generation is below the 1,000 annual average daily traffic (AADT) total vehicles / 200 AADT of Heavy Duty Vehicles (HDV) screening thresholds defined within the applied IAQM guidance. Refer to Air Quality Assessment, SLR Consulting Ltd which concludes the proposed development would have 'no likely significant effect' and no further assessment is required.
- 6.5 Twenty other non-statutory designated sites were located within 1km of the site boundary, all of which were LWSs. Markfield Roadside Verge #3 LWS sits directly adjacent to the southern boundary of the site and the design has ensured that access to the site from the A50 avoids this. Another three grassland LWS occur within 200m of the site and the eastern part of the site was noted as a Historical Site, identified in the 1980's/90s for scrub habitats. Scrub habitats in this part of the site are limited to field boundaries, arising from outgrown hedges with trees,

however some of this historical designation comprises grassland that has been subject to quadrat surveys (results presented at Appendix B).

- 6.6 The Hinckley & Bosworth Local Plan, Policy DM6 states:
- 6.7 Development proposals affecting locally important sites should always seek to contribute to their favourable management in the long term.

'Where a proposal is likely to result in harm to locally important sites (including habitats or species of principal importance for biodiversity), developers will be required to accord with the following sequential approach:

- h) Firstly, seek an alternative site with a lesser impact than that proposed;*
- i) Secondly, and if the first is not possible, demonstrate mitigation measures can be taken on site;*
- j) Thirdly, and as a last resort, seek appropriate compensation measures, on site wherever possible and off site where this is not feasible.'*

Habitats

- 6.8 The degree to which habitats receive consideration within the planning system relies on a number of mechanisms, including:
- Inclusion within a specific policy, for example veteran trees, ancient woodland and linear habitats within the National Planning Policy Framework (NPPF);
 - A non-statutory site designation;
 - Habitats considered as habitats of principal importance for the conservation of biodiversity as listed within Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act (2006); and
 - Habitats identified as being a Priority Habitat within the local Biodiversity Action Plan.
- 6.9 The grassland across the majority of the site was of species poor improved / modified and comprised common and widespread species. This habitat does not fall under any of the above listed and its loss is not an ecological constraint to development of the site. Tall ruderal vegetation are habitats of limited floristic diversity and are considered to be of low nature conservation value. These habitats are species poor, and species recorded are common and widespread. The loss of these areas of habitat is not considered to be constraint to proposals. The inclusion of species rich grassland and species rich wet grassland within areas of public open space would contribute to maximising the biodiversity value of the site post development.
- 6.10 Other neutral grassland has been recorded in the east of the site. The two grassland compartments east of Cottage Lane comprised diversity of flora that almost meets the requirements of LWS qualification for mesotrophic grassland. It is not considered likely that these fields are seasonally flooded and therefore have not been assessed against the wet grassland criteria. Data presented at Appendix B demonstrated this grassland habitat is just 1 species short of qualification as a LWS, therefore taking a precautionary approach and considering this habitat as you would a *locally important site*, following the sequential approach listed above:

h) a vehicular access out to Whitwick Road is required as an in and out flow of traffic directly from the A50 is an unacceptable flow from a highways perspective and the access from the Site onto Whitwick Road is positioned where it is to minimise the distance of travel on Whitwick Road before rejoining the A50 to minimise traffic disturbance on this minor road;

i) ground works required to achieve the necessary levels across the site and deliver the road infrastructure, attenuation and development plateaus limits the feasibility to retain and enhance this grassland, however where practical at the perimeters, this grassland shall be retained and enhanced.

j) creation of other neutral grassland is proposed throughout the schemes landscape proposals to compensate for the loss of grassland across the site. It is proposed that Emorsgate EM 3 meadow mixture or similar is sown. Meadow mixture EM 3 contains 11 species that occur on 'List F' on the LWS criteria for mesotrophic grassland so with the appropriate preparation and management, establishment of grassland comprising a comparable diversity of species as will be lost (and potentially capable of qualification as LWS standard grassland), is feasible. Proposals involve the loss of 1.95ha of other neutral grassland and creation of approximately 8ha of other neutral grassland post development.

- 6.11 As such, the post development habitat creation provides compensation and requirements of Policy DM6 and mitigation hierarchy have been followed.
- 6.12 Areas of mixed or blackthorn scrub do not fall under any of the above listed and its loss is not an ecological constraint to development of the site, however it is established structural vegetation that provides shelter and foraging for a range of fauna. Where this habitat can be incorporated into the design of the scheme, retention and long term management would ensure continuity of this ecological resource. Areas of new native scrub planting will be provided that shall far exceed the area lost, offering an enhancement to this ecological resource.
- 6.13 Onsite mature trees provide intrinsic nature conservation value, offering diversity of vegetation structure, microhabitats for invertebrates and nesting opportunities for birds. Retention of mature trees with appropriate root protection zones has been incorporated into the design wherever feasible. The retention and long term management of retained trees where feasible will contribute to maintaining the biodiversity value of the Site. It is however acknowledged that the viability of this scheme required a large scale cut and fill to relevel the site, which is not conducive to retention of all existing features. Vegetation at the perimeter of the site are to be retained however all vegetation within development parcels is to be lost.
- 6.14 To avoid damage/disturbance of retained features during construction, it is recommended that Ecological Protection Zones (EPZ) should be established during the construction phase. EPZs can often be achieved through co-ordination with tree protection measures required as good arboricultural practice, including temporary protective fencing and signage. It is recommended that details of such measures and their implementation are delivered through an Ecological Construction Method Statement (ECMS) prepared for the Site.
- 6.15 The proposals seek to incorporate new native tree planting, native scrub planting and species rich hedgerows into the design, to replace and enhance retained habitat corridors and offer new wildlife links to compensate inevitable losses from tree, scrub and hedge removal.

- 6.16 Sitting within The National Forest and the Charnwood Forest Regional Park, the site provides opportunities for landscaping that would be complementary to the objectives of these designations.
- 6.17 The Hinckley & Bosworth Green Infrastructure Strategy identifies the southern edge of the site as a 'Priority plane for woodland planting'. As such a total of 1.8ha of woodland planting as well as over 400 individual trees are proposed to be planted across the site. 1.4km of hedge will be lost with 3Km of new hedge to be planted according to the current Landscape Strategy.
- 6.18 Currently there are no onsite ponds. Proposals require the inclusion of Sustainable Drainage Systems (SuDS). SuDS features shall be designed to provide biodiversity benefits by retaining an area of water year round and also engineered to have margins of varying slope gradients and aspects to maximise microhabitats. Seeding this with a native species rich wet grassland mix and appropriate marginal planting is proposed. This will introduce permanent water sources for local fauna to the site creating greater habitat diversity.
- 6.19 In addition, further habitat creation opportunities within the proposed green infrastructure (GI) of the scheme that will contribute towards compensation of habitat losses associated with the site clearance include:
- Use of a native species grassland mix such as a flowering lawn mix such as Emorsgate Seeds EL1 (following manufacturers guidelines) for formal areas and as described above, a combination of Emorsgate Seeds EM3 and Emorsgate Seeds EM10 or similar in informal areas that can be less intensively managed.
 - New native species hedgerow planting incorporated into the scheme to increase connectivity across the site and compensate for scrub loss. Suggested species include field maple *Acer campestre*, hawthorn, holly *Ilex aquifolium*, blackthorn and dog rose *Rosa canina*.
 - Standard native trees to be planted at 30m intervals along the new hedgerows. Street planting trees to consider native species (suitable species including: English oak, wild cherry *Prunus avium*, silver birch *Betula pendula*, rowan *Sorbus aucuparia*, common beech *Fagus sylvatica*, crab apple *Malus sylvestris* or European hornbeam *Carpinus betulus*).

Fauna

Badgers – Confidential – Badger Report available to relevant consultees only.

Great Crested Newt

- 6.20 No records of GCN were identified locally during the desk study. No ponds occur within the site and the only pond identified within 500m and not physically separated from the site by barriers to dispersal was eDNA tested and returned a negative result. From the completed survey work it is concluded that no GCN populations are utilising the site and therefore the proposed development activities at this site are not at risk of harm to GCN. Great crested newt are therefore not a constraint to development of the site and no mitigation or protective measures for this species are recommended.

Reptiles

- 6.21 No records of reptile were identified locally during the desk study. From the completed survey work it is concluded that no reptile populations are utilising the site and therefore the proposed development activities at this site are not at risk of harm to reptiles. Reptiles are therefore not a constraint to development of the site and no mitigation or protective measures for reptiles are recommended.

Bats

- 6.22 All species of British bat are listed as European Protected Species (EPS) on Schedule 2 of the Conservation Regulations (Annex IV(a) to the Habitats Directive). This affords them strict protection under the Conservation of Habitats and Species (Amendment) Regulations 2017, making it an offence to:
- (i) Deliberately capture, injure or kill a wild animal of an EPS;
 - (ii) Deliberately disturb wild animals of an EPS wherever they are occurring, in particular any disturbance that is likely to impair their ability to survive, to breed or reproduce, or in the case of hibernating or migratory species, to hibernate or migrate; or to affect significantly the local distribution or abundance of the species to which they belong;
 - (iii) Deliberately take or destroy the eggs of a wild animal of an EPS; or
 - (iv) Damage or destroy a breeding site or resting place of a wild animal of an EPS.
- 6.23 Additional protection for bats is also afforded under the Wildlife and Countryside Act 1981 (as amended), making it an offence to intentionally or recklessly disturb bats whilst they are occupying a structure or place which is used for shelter or protection, or to obstruct access to this structure or place.

Roosting

- 6.24 Based on ground based tree assessments, 46 mature trees on the Site provided potentially suitable roost features for bats. The trees were later aerially assessed and categorised into Negligible, PRF-I or PRF-M. 4.4 Of the 46 trees recorded, 14 were identified as having PRF-I features, 6 as having PRF-M features, 3 trees categorised as having potential but were not able to be confidently checked and were surveyed nocturnally. The remaining 26 trees were identified as providing Negligible potential for roosting bats and are not a constraint to the proposals. The PRF-I trees were subject to a single climb and PRF-M trees were aerially inspected on 3 occasions. No roosting evidence was recorded and therefore no roost was identified to be present at the time of any of the aerial inspections. The three trees were unable to be safely assessed and were subject to a single nocturnal survey and no evidence of roosting bats were identified emerging from these trees.
- 6.25 Buildings B1, B4 and B8 were assessed as having moderate potential for supporting roosting bats and were subjected to two nocturnal surveys. Nocturnal surveys of these buildings did not result in finding a roost and therefore the buildings are not considered a constraint for roosting bats.
- 6.26 Survey data is current for up to 2 years. Updating surveys may therefore be necessary prior to works. In the unlikely event that any bats or evidence of bats is discovered during pre-commencement surveys or the works then works will be stopped immediately until advice has been sought from a licenced bat ecologist.

- 6.27 Irrespective, additional roost features through the provision of bat boxes on retained mature trees or a integrated into or externally mounted to the industrial units would be beneficial and provide alternative local potential roost sites, enhancing opportunities for this species. The illumination of any integrated features and/or bat boxes by security lighting or similar is to be avoided.

Foraging/Commuting

- 6.28 Survey data indicates the Site supports an assemblage of foraging and commuting bats, with activity recorded by transect and the statics detector surveys consistently dominated by common pipistrelle and soprano pipistrelle, which are both widespread and abundant species. Nathusius' pipistrelle bat and barbastelle bat were recorded on site but the proportion was low, accounting for less than 1% of the total registrations recorded suggesting that the Site only forms a minor part of a network of foraging and commuting areas within the wider landscape. Overall, the assemblage of species recorded using the Site was not considered as being of more than local level importance. No pattern of activity was noted in the timing of activity of any species that was indicative of the presence of a nearby roost site.
- 6.29 The development requires the removal of internal trees and hedgerows to facilitate the necessary levels to deliver the proposed layout, though the central block of woodland and all perimeter structural vegetation will be retained, maintaining commuting links around the site to the wider landscape. The proposed Landscape Strategy with approximately 3km of new hedgerow planting as well as woodland and scrub planting will contribute towards compensation for habitat losses, providing replacement commuting and foraging resources, together with the proposed grassland and wetland features in the mid to long term as these habitats establish.
- 6.30 Both common and soprano pipistrelles are known to adapt to the urban environment but a wildlife-sensitive lighting scheme will be necessary to avoid or minimise light spill where development is located in close proximity to any scrub edge, hedgerows, water features and other retained or created vegetation to ensure more light sensitive species are not inhibited from utilising onsite retained and created foraging and commuting resources. This could be achieved through a combination of positioning of fittings/luminaires and other design features such as directional hoods/baffles, timers, low level bollards, etc., to maintain 'dark zones' in key locations.
- 6.31 Full discussion of all bat survey work and proposed mitigation is presented in a separate Bat Report (FPCR, June 2025).

Breeding Birds

- 6.32 All wild birds, their nests and eggs are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:
- i) Intentionally kill, injure or take any wild bird;
 - ii) Take, damage or destroy the nest of any wild bird while it is in use or being built;
 - iii) Take, damage or destroy the egg of any wild bird; or
 - (iv) To have in one's possession, or control, any wild bird (dead or alive) or egg or any part of a wild bird or egg.

- 6.33 In addition, further protection is afforded to those wild bird species listed on Schedule 1, prohibiting any intentional or reckless disturbance to these species while it is nest building, or at a nest containing eggs or young, or to recklessly disturb the dependent young of such a bird. In addition to, or in the absence of, legal protection, some species are also of conservation concern and may also be subject to specific UK and local BAP measures.
- 6.34 Breeding bird surveys were completed in 2024, which recorded a total of 30 species within the Site, 10 of which were considered notable species. Seven species recorded on Site were confirmed as breeding and included notable species starling *Sturnus vulgaris* and dunnoek *Prunella modularis*. Other species confirmed as breeders within the Site also included non notable great tit *Parus major*, blue tit *Cyanistes caeruleus*, great spotted woodpecker *Dendrocopos major*, pied wagtail *Motacilla alba* and robin *Erithacus rubecula*. A further two probable breeding species and 18 possible breeding species were recorded. The majority of the bird species were common generalist species which are typical of the agricultural, hedgerow, and scrub habitats present on-Site. The majority of bird activity was within hedge and scrub habitats with grassland supporting limited activity.
- 6.35 A large proportion of the hedgerow habitat within the Site is proposed to be lost, though species recorded were mostly common and widespread generalists that are tolerant of moderate to high levels of anthropogenic disturbance, some species such as song thrush and dunnoek are likely to be displaced during the construction phase. However once development is complete the proposed green infrastructure throughout the Site will provide additional foraging, breeding, and connective habitat for a range of birds.
- 6.36 To avoid disturbance to breeding birds, ground and vegetation clearance works will be undertaken prior to the bird-breeding season (i.e. avoiding March to August, inclusive). If works to remove hedgerows, scrub and trees were to be required during the breeding season (March to August), methods of working will need to be detailed within an ECMS prepared for the Site. This would include checking any areas to be cleared for signs of nesting (nests or displaying males), by an ecologist prior to commencement. If evidence of nesting is recorded, works within that particular area shall not proceed until the chicks have fledged, with a buffer zone around the active nest of a minimum of 5 metres. Toolbox talks should be conducted to site personnel prior to any vegetation works taking place.
- 6.37 Retention of established structural vegetation that offers suitable nesting habitat where feasible will offer continuity of breeding and foraging habitat for birds and landscaping of the scheme will include native fruit and seed bearing species of local origin to provide an optimal foraging resources for a range of bird species post development. In addition to this, it is recommended that a variety of bird boxes be installed on retained mature trees within the development.
- 6.38 Full discussion of all bird survey work and proposed mitigation is presented in a separate Bird Report (FPCR, May 2025).

Hedgehogs

- 6.39 Whilst hedgehogs are not a Protected Species, their populations have declined significantly in recent years and are a Priority Species for conservation. Records of hedgehogs are present locally and could be using the Site for foraging purposes. Therefore, it is recommended that,

during construction, any excavations are not left uncovered overnight or have an escape ramp inserted into them to avoid any mammals becoming trapped.

- 6.40 The main hedgehog habitat on the Site is within the more sheltered scrub habitat where they may hibernate within piles of dead vegetation and debris. Removal of such material across the Site should be conducted outside of November to February inclusive. During the construction phase, it is also recommended that materials should not be stored near areas of retained habitat or should be hand searched prior to removal.
- 6.41 The post development green infrastructure offer habitat corridors that would maintain foraging corridors for mammals through the site and allow continued access to the wider countryside.

Summary of Habitat Enhancements

- 6.42 Retention of existing habitats of value will be incorporated to the scheme where possible including mature trees, hedgerows and linear sections of mature scrub to maintain habitat connectivity across the site with retained perimeter vegetation linking into offsite network of corridor habitat beyond the site boundary. Retained trees, hedgerows and mature scrub would be suitably protected during construction activities i.e. working methods should adhere to standard best practice guidance. This would include BS5837 Trees in Relation to Construction – Recommendations: 2012 for trees and hedgerows. Creation of new native species hedgerows would further enhance this habitat network if they can be incorporated into the design.
- 6.43 Open areas of public open space will be created using native and species rich grassland mixes to create species rich grassland corridors linking through the scheme.
- 6.44 Creation of attenuation features within the development will provide biodiversity value, function and aesthetic appeal. Such features will seek to retain an area of water year round and also be engineered to have margins of varying slope gradients and aspects to maximise microhabitats. Seeding with a native species rich wet grassland mix and appropriate marginal planting will maximise their biodiversity value.
- 6.45 Acknowledging the position of the site within the National and Charnwood Forest, planting of standard trees, creation of hedgerows and other linear structural vegetation features will be integrated throughout the development. As such a total of 1.8ha of woodland planting as well as over 400 individual trees are proposed to be planted across the site. 1.4km of hedge will be lost with 3Km of new hedge to be planted according to the current Landscape Strategy.
- 6.46 In addition to this, the site offers a range of opportunities to incorporate enhancement features for a variety of faunal species including provision of bat and bird boxes and log piles to enhance habitats for invertebrates and reinforce foraging for other fauna.

Biodiversity Net Gain

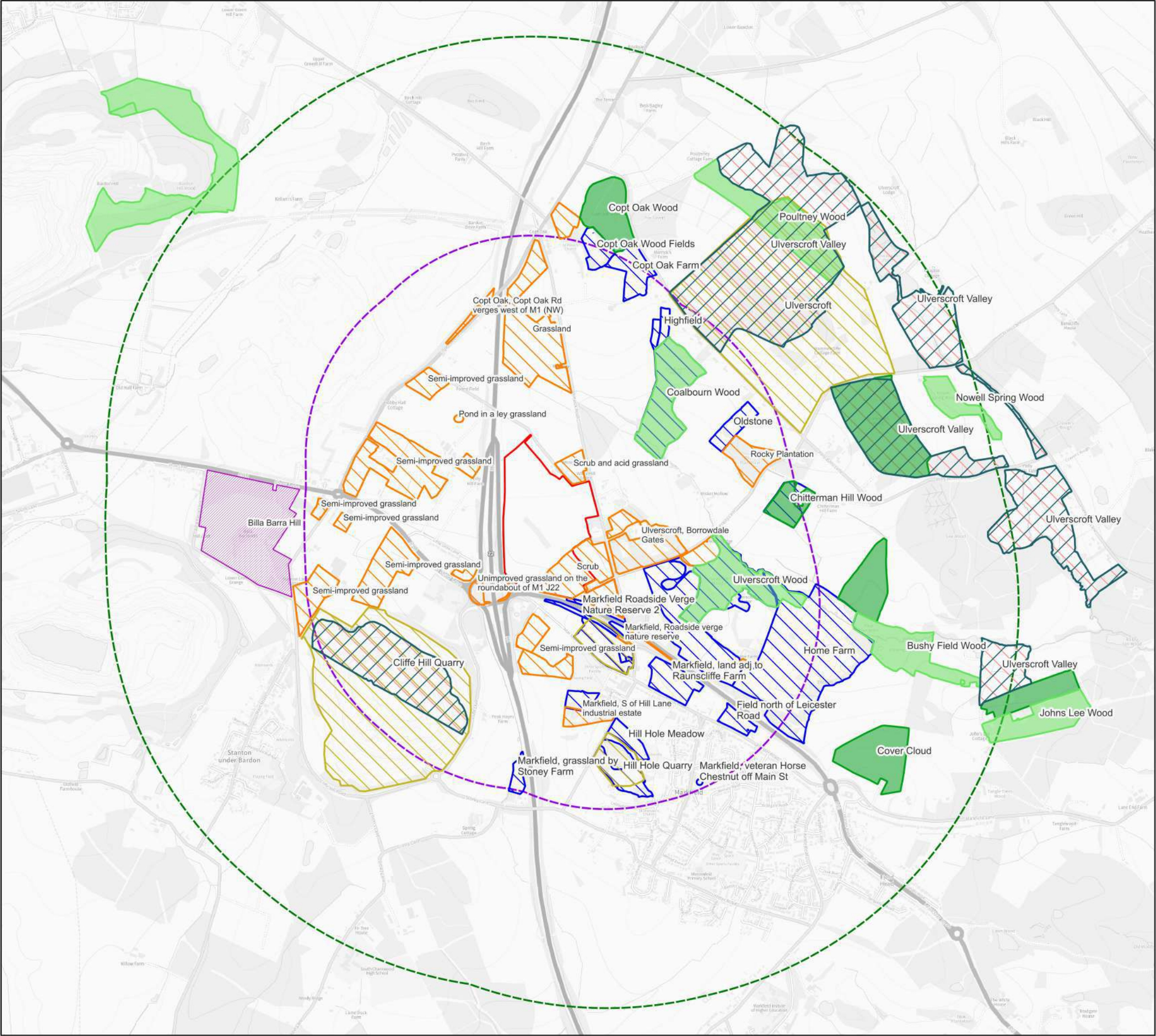
- 6.47 In line with National and local policy this report should be read in conjunction with the Biodiversity Net Gain Assessment report and associated Statutory Metric produced for the Proposed Development based on the latest Landscape Strategy.

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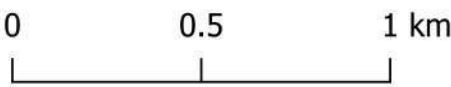


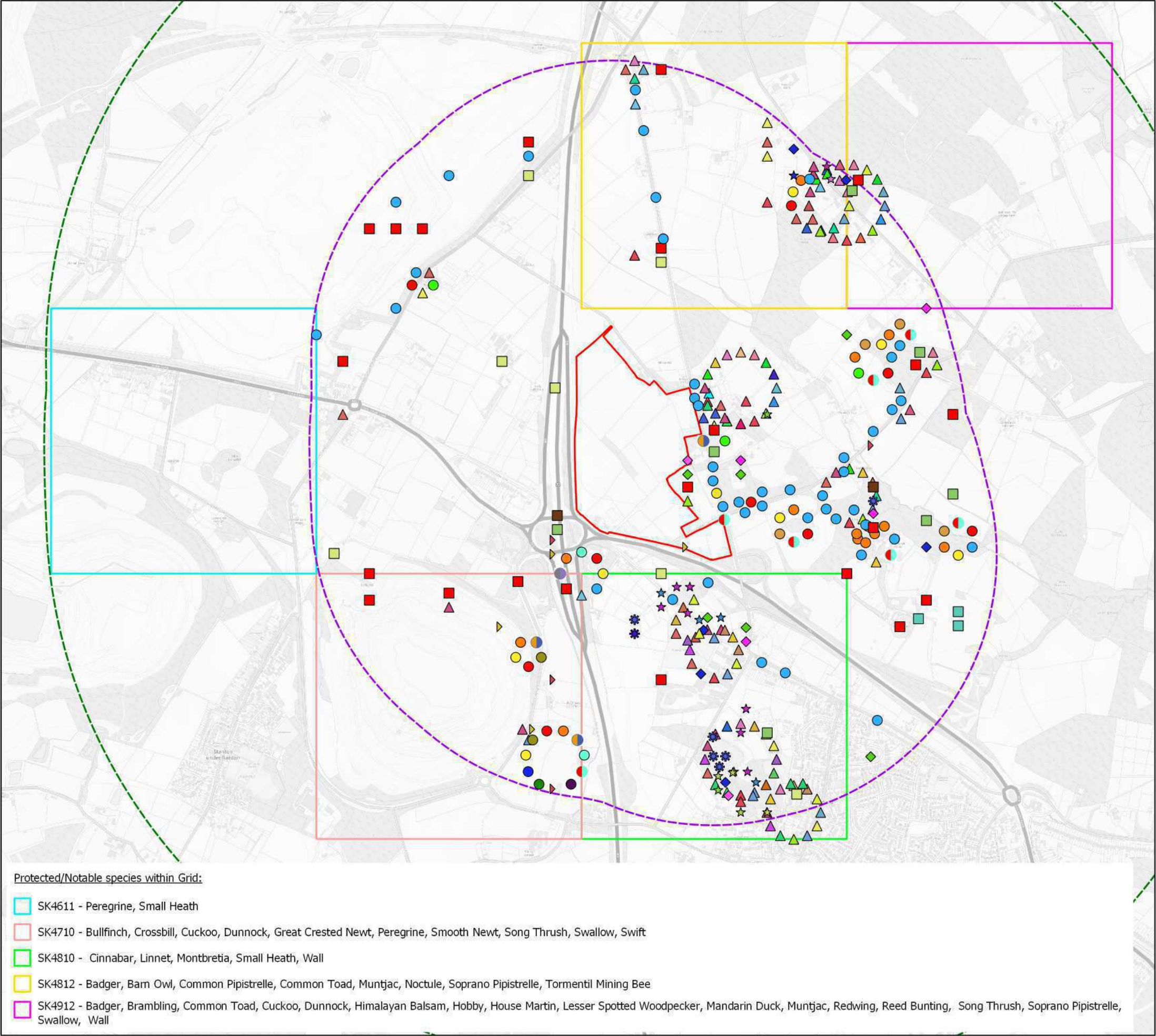
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Key

- Site Boundary
- 1km Site Buffer
- 2km Site Buffer
- Sites of Special Scientific Interest (SSSI)
- Local Wildlife Sites (LWS)
- Local Nature Reserves (LNR)
- RIGS Sites
- National Sites
- Historic Sites
- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland





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Key

Site Boundary 1km Site Buffer 2km Site Buffer

Protected/Notable Species within 1km

Bats

- Unidentified Bat sp.
- Brown Long-eared Bat
- Common Pipistrelle
- Daubenton's Bat
- Leisler's Bat
- Myotis Bat species
- Nathusius's Pipistrelle
- Natterer's Bat
- Noctule
- Nyctalus Bat species
- Pipistrelle Bat species
- Serotine
- Soprano Pipistrelle
- Whiskered/Brandt's Bat

Birds

- Barn Owl
- Bee-eater
- Bullfinch
- Cherry Laurel
- Crossbill
- Cuckoo
- Curlew
- Dunnock
- Fieldfare
- Golden Oriole
- Grasshopper Warbler
- Greylag Goose
- Hawfinch
- Hobby
- House Martin
- House Sparrow
- Lesser Redpoll
- Lesser Spotted Woodpecker
- Linnet
- Mandarin Duck
- Marsh Tit
- Osprey
- Peregrine
- Quail
- Red Kite
- Redwing
- Reed Bunting
- Sand Martin
- Skylark
- Song Thrush
- Spotted Flycatcher
- Starling
- Swallow
- Swift
- Tree Pipit
- White-fronted Goose
- Willow Tit
- Yellowhammer

Crustacean

- Signal Crayfish
- White-clawed Crayfish

Herpetofauna

- Common Frog
- Common Lizard
- Common Toad
- Smooth Newt

Invertebrates

- Brindled Beauty
- Cinnabar
- Flounced Chestnut
- Harlequin Ladybird
- Small Heath
- Small Phoenix
- Wall
- White-letter Hairstreak

Invasive Flowering Plants

- Himalayan Balsam
- Japanese Knotweed

Mammals

- Badger
- Hedgehog
- Muntjac
- Otter
- Sika Deer

Protected/Notable species within Grid:

- SK4611 - Peregrine, Small Heath
- SK4710 - Bullfinch, Crossbill, Cuckoo, Dunnock, Great Crested Newt, Peregrine, Smooth Newt, Song Thrush, Swallow, Swift
- SK4810 - Cinnabar, Linnet, Montbretia, Small Heath, Wall
- SK4812 - Badger, Barn Owl, Common Pipistrelle, Common Toad, Muntjac, Noctule, Soprano Pipistrelle, Tormentil Mining Bee
- SK4912 - Badger, Brambling, Common Toad, Cuckoo, Dunnock, Himalayan Balsam, Hobby, House Martin, Lesser Spotted Woodpecker, Mandarin Duck, Muntjac, Redwing, Reed Bunting, Song Thrush, Soprano Pipistrelle, Swallow, Wall

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 Site Boundary

Baseline Habitats

-  **Artificial unvegetated, unsealed surface**
-  **Blackthorn scrub (S3)**
-  **Developed land; sealed surface**
-  **Lowland mixed deciduous woodland (W3)**
-  **Mixed scrub (S1, S2, S4, S5)**
-  **Modified grassland**
-  **Other neutral grassland (G1)**
-  **Other Scot's pine woodland (W1, W2)**
-  **Tall herb communities**

Baseline Hedgerows

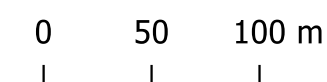
-  **Line of trees (L1)**
-  **Native hedgerow (H2, H4, H9, H10, H11. H15)**
-  **Native hedgerow - associated with bank or ditch (H5, H6, H12)**
-  **Native hedgerow with trees (H8, H14, H17, H18, H19, H20)**
-  **Native hedgerow with trees - associated with bank or ditch (H1, H3, H7, H13, H16)**

Baseline Watercourses

- 
- Ditches**

Baseline Individual Trees

-  **Existing Large Rural Tree**
-  **Existing Medium Rural Tree**
-  **Existing Small Rural Tree**

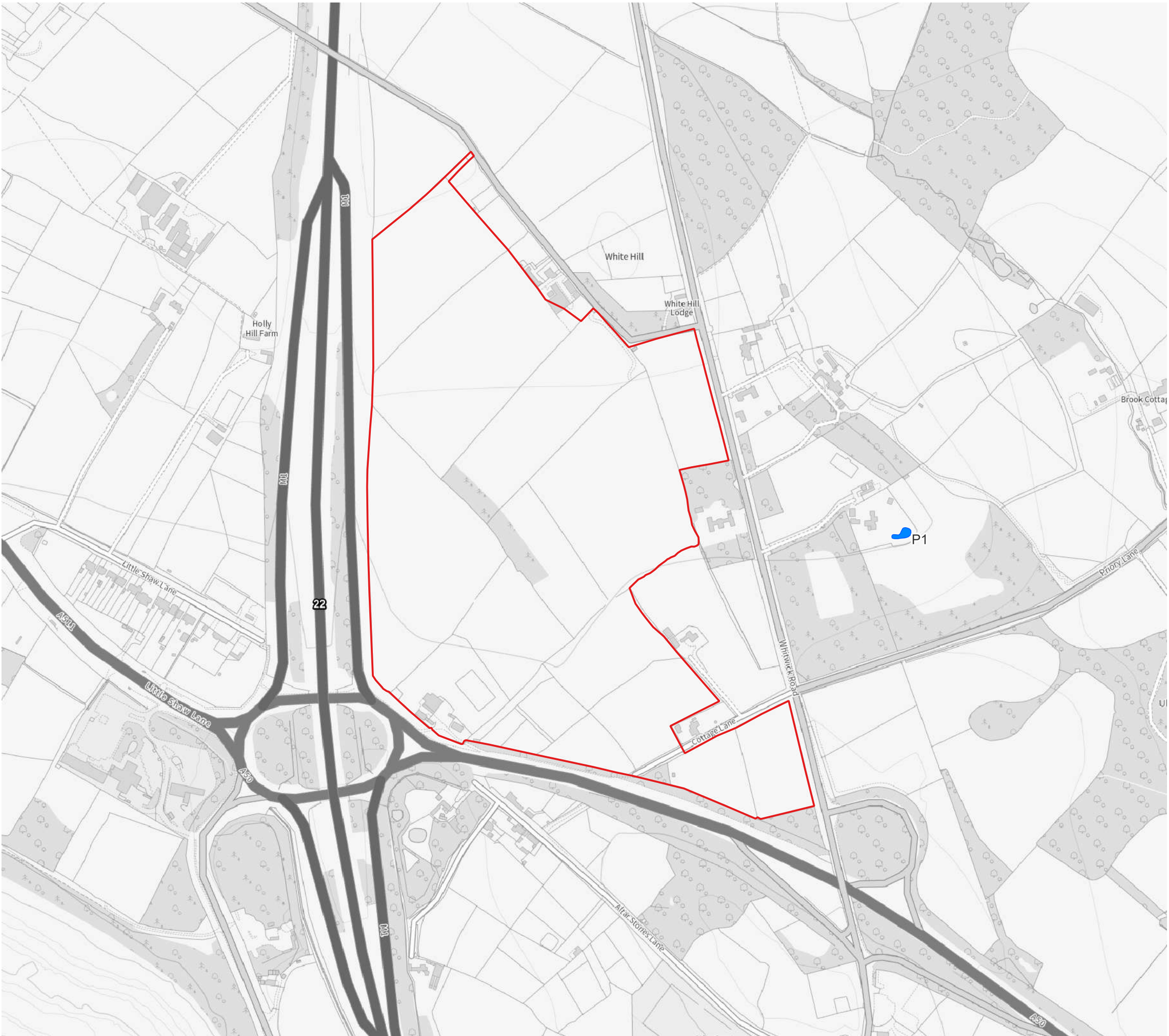


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 scale @ A3
 1:3,500
 drawing / figure number
Figure 2

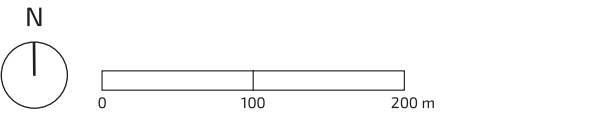
drawn
 CF / LFR

issue date
 15/4/2024



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Key

- Site Boundary
- Pond

date	drwn/chkd
11/12/24	EH / LFR

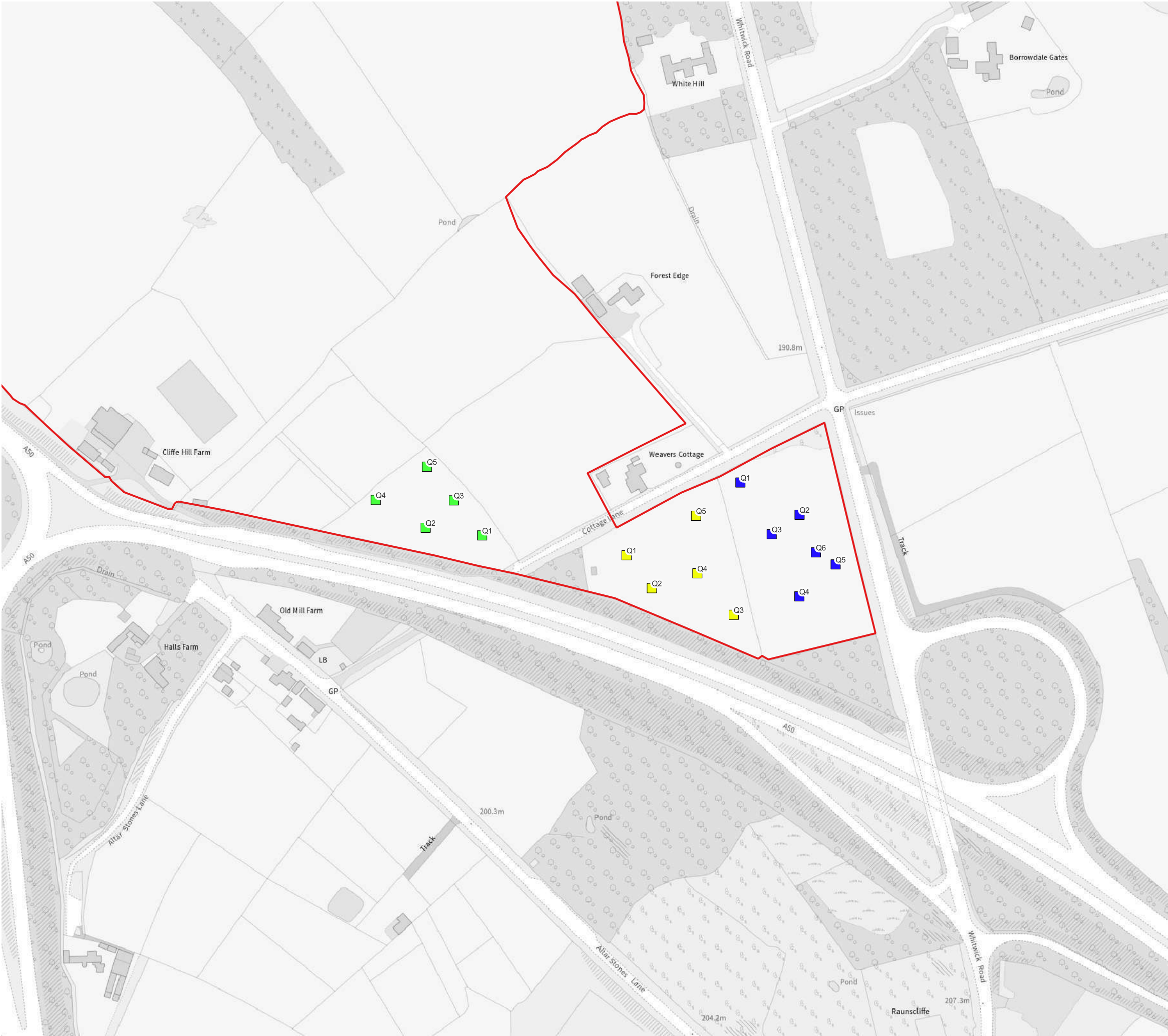
client	
Caddick Developments Limited	
project	

Land at Junction 22 of the M1, Cliffe Hill Farm	
--	--

title	scale
WATERBODY LOCATIONS PLAN	1:5,000 @ A3

number	rev
FIGURE 3	-

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 **Site Boundary**

Quadrat Locations

-  **Field 1**
-  **Field 2**
-  **Field 3**

date	drwn/chkd
11/12/24	EH / LFR

client
Caddick Developments Limited

project

**Land at Junction 22 of the M1,
Cliffe Hill Farm**

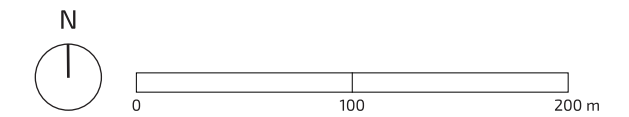
title	scale
QUADRAT LOCATION PLAN	1:2,500 @ A3

number	rev
FIGURE 4	-



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Key

 **Site Boundary**

 Tin Location

date
10/06/25

drwn/chkd
EH / LFR

client

Caddick Developments Limited

project

**Land at Junction 22 of the M1,
Cliffe Hill Farm**

title
REPTILE TIN LOCATION PLAN

scale
1:3,500 @ A3

number

rev

FIGURE 5

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APPENDIX A: BOTANICAL SPECIES LIST

Improved / Modified Grassland

Annual Meadow-grass	<i>Poa annua</i>
Bracken	<i>Pteridium aquilinum</i>
Bramble	<i>Rubus fruticosus</i> agg.
Bristly Oxtongue	<i>Picris echioides</i>
Broad-leaved Dock	<i>Rumex obtusifolius</i>
Cleavers	<i>Galium aparine</i>
Cock's-foot	<i>Dactylis glomerata</i>
Common Cat's-ear	<i>Hypochaeris radicata</i>
Common Chickweed	<i>Stellaria media</i>
Common Nettle	<i>Urtica dioica</i>
Common Sorrel	<i>Rumex acetosa</i>
Common Vetch	<i>Vicia sativa</i>
Cow Parsley	<i>Anthriscus sylvestris</i>
Creeping Bent	<i>Agrostis stolonifera</i>
Creeping Buttercup	<i>Ranunculus repens</i>
Creeping Thistle	<i>Cirsium arvense</i>
Curled Dock	<i>Rumex crispus</i>
Dandelion	<i>Taraxacum officinale</i> agg.
Field Horsetail	<i>Equisetum arvense</i>
Greater Stitchwort	<i>Stellaria holostea</i>
Ground-elder	<i>Aegopodium podagraria</i>
Groundsel	<i>Senecio vulgaris</i>
Hogweed	<i>Heracleum sphondylium</i>
Meadow Buttercup	<i>Ranunculus acris</i>
Perennial Rye-grass	<i>Lolium perenne</i>
Pineapple Weed	<i>Matricaria discoidea</i>
Ribwort Plantain	<i>Plantago lanceolata</i>
Smooth Sow-thistle	<i>Sonchus oleraceus</i>
Spear Thistle	<i>Cirsium vulgare</i>
Sticky Mouse-ear	<i>Cerastium glomeratum</i>
Thyme-leaved Speedwell	<i>Veronica serpyllifolia</i>
Tufted Hair-grass	<i>Deschampsia caespitosa</i>
Wavy Bitter-cress	<i>Cardamine flexuosa</i>
White Clover	<i>Trifolium repens</i>
Wild Angelica	<i>Angelica sylvestris</i>
a willowherb	<i>Epilobium</i> sp.
Yorkshire-fog	<i>Holcus lanatus</i>

Semi-improved / Other Neutral Grassland

Bramble	<i>Rubus fruticosus</i> agg.
Cock's-foot	<i>Dactylis glomerata</i>
Common Bent	<i>Agrostis capillaris</i>
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>
Common Cat's-ear	<i>Hypochaeris radicata</i>
Common Chickweed	<i>Stellaria media</i>
Common Knapweed	<i>Centaurea nigra</i>

a common mouse-ear
 Common Nettle
 Common Ragwort
 Common Sorrel
 Creeping Bent
 Creeping Buttercup
 Creeping Thistle
 Cuckoo-flower
 Dandelion
 Great Burnet
 Marsh Thistle
 Meadow Buttercup
 Meadow Vetchling
 Meadowsweet
 Oxeye Daisy
 Ribwort Plantain
 Scarlet Pimpernel
 a sedge
 Selfheal
 Sheep's Fescue [agg.]
 Soft Rush
 Sweet Vernal Grass
 Tufted Hair-grass
 White Clover
 Wild Angelica
 a willowherb
 Yorkshire-fog

Cerastium fontanum ssp. vulgare
Urtica dioica
Senecio jacobaea
Rumex acetosa
Agrostis stolonifera
Ranunculus repens
Cirsium arvense
Cardamine pratensis
Taraxacum officinale agg.
Sanguisorba officinalis
Cirsium palustre
Ranunculus acris
Lathyrus pratensis
Filipendula ulmaria
Leucanthemum vulgare
Plantago lanceolata
Anagallis arvensis
Carex sp.
Prunella vulgaris
Festuca ovina agg.
Juncus effusus
Anthoxanthum odoratum
Deschampsia caespitosa
Trifolium repens
Angelica sylvestris
Epilobium sp.
Holcus lanatus

Scots Pine Plantation

Ash
 Beech
 Bluebell
 Bramble
 Cleavers
 Cock's-foot
 Common Bent
 Common Nettle
 Creeping Buttercup
 Dog Rose
 Elder
 False Oat-grass
 a forget-me-not
 Foxglove
 Greater Stitchwort
 Hawthorn
 Hazel
 Hedge Woundwort
 Holly
 Honeysuckle
 an oak
 Red Campion

Fraxinus excelsior
Fagus sylvatica
Hyacinthoides non-scripta
Rubus fruticosus agg.
Galium aparine
Dactylis glomerata
Agrostis capillaris
Urtica dioica
Ranunculus repens
Rosa canina agg.
Sambucus nigra
Arrhenatherum elatius
Myosotis sp.
Digitalis purpurea
Stellaria holostea
Crataegus monogyna
Corylus avellana
Stachys sylvatica
Ilex aquifolium
Lonicera periclymenum
Quercus sp.
Silene dioica

Remote Sedge
Scots Pine
Smooth Meadow-grass
Soft Rush
Yorkshire-fog

Carex remota
Pinus sylvestris
Poa pratensis sens.lat.
Juncus effusus
Holcus lanatus

Other Broadleaf Woodland

Bramble
Common Nettle
Hazel
Holly
Honeysuckle
Ivy
Perennial Rye-grass
Pedunculate Oak
Rowan
Silver Birch

Rubus fruticosus agg.
Urtica dioica
Corylus avellana
Ilex aquifolium
Lonicera periclymenum
Hedera helix
Lolium perenne
Quercus robur
Sorbus aucuparia
Betula pendula

Hedgerows

Ash
Blackthorn
Bramble
Common Nettle
Dog Rose
Elder
Field Maple
Field Rose
Gorse
Hawthorn
Hazel
Holly
Honeysuckle
Ivy
Pedunculate Oak
Rowan
Sycamore
a willow

Fraxinus excelsior
Prunus spinosa
Rubus fruticosus agg.
Urtica dioica
Rosa canina agg.
Sambucus nigra
Acer campestre
Rosa arvensis
Ulex europaeus
Crataegus monogyna
Corylus avellana
Ilex aquifolium
Lonicera periclymenum
Hedera helix
Quercus robur
Sorbus aucuparia
Acer pseudoplatanus
Salix cinerea ssp. oleifolia

Appendix B: Other Neutral Grassland Quadrat Survey Results- August 2024

Field F1

Common Name	Latin Name	Present	Q1	Q2	Q3	Q4	Q5	DAFOR
Bramble	<i>Rubus fruticosus</i> agg.			8				R/LO
Cock's-foot	<i>Dactylis glomerata</i>				2			R
Common Bent	<i>Agrostis capillaris</i>		30	30	40	20	15	A
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>		1	10	2	8	20	O
Common Chickweed	<i>Stellaria media</i>	P						R
Common Cudweed	<i>Filago vulgaris</i>	P						R
Common Daisy	<i>Bellis perennis</i>	P						R
Common Knapweed	<i>Centaurea nigra</i>		5	5	4	1	2	O
Common mouse-ear	<i>Cerastium fontanum</i>	P						R
Common Mint	<i>Mentha aquatica</i>		7					LO
Common Nettle	<i>Urtica dioica</i>	P						R
Common Ragwort	<i>Senecio jacobaea</i>		1					R
Common Sorrel	<i>Rumex acetosa</i>		<1	1				R
Creeping Bent	<i>Agrostis stolonifera</i>		25	10	10	5	20	F
Creeping Buttercup	<i>Ranunculus repens</i>		7	3	1			O
Creeping Thistle	<i>Cirsium arvense</i>		2			5		R
Crested Dogs tail	<i>Cynosaurus cristatus</i>					10		LO
*Cuckoo-flower	<i>Cardamine pratensis</i>	P						R
Dandelion	<i>Taraxacum officinale</i> agg.	P						R
Great Burnet	<i>Sanguisorba officinalis</i>			8			8	O
Hogweed	<i>Heracleum sphondylium</i>			<1				R
*Jointed Rush	<i>Juncus articulatus</i>		3					R
Meadow Buttercup	<i>Ranunculus acris</i>	P						R
Meadow Vetchling	<i>Lathyrus pratensis</i>			1	1	1	5	O
Red Clover	<i>Trifolium pratense</i>	P						R
Red Fescue	<i>Festuca rubra</i>				5	20	15	O
Ribwort Plantain	<i>Plantago lanceolata</i>		6		2		2	R
Scarlet Pimpernel	<i>Anagallis arvensis</i>	P						R
Glaucous sedge	<i>Carex flacca</i>	P						R
a sedge (other)	<i>Carex</i> sp.		3					R
Selfheal	<i>Prunella vulgaris</i>		3					R
Sheep's Fescue [agg.]	<i>Festuca ovina</i> agg.			1	3	10		R
Smooth Sowthistle	<i>Sonchus oleraceus</i>	P						R
Smooth Tare	<i>Vicia tetrasperma</i>				3	1		R
Soft Brome	<i>Bromus hordeaceus</i>	P						R
*Soft Rush	<i>Juncus effusus</i>		2					R
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>			5	3	10	10	O
Tormentil	<i>Potentilla erecta</i>	P						R
Tufted Hair-grass	<i>Deschampsia caespitosa</i>		1		12			R/LO
a willowherb	<i>Epilobium</i> sp.	P						R
Yorkshire-fog	<i>Holcus lanatus</i>		10	20	10	10	5	O
Total No. Sp.			16	13	14	12	10	
No. Sp excluding those indicative of suboptimal conditions			13	11	12	10	9	

D: Dominant by 75-100% / A: Abundant by 25-74% / F: Frequent by 10-24% / O: Occasional by 5-9% / R: Rare by <5%.

9 LWS mesotrophic grassland criteria (List F) species present, 4 are occasional or above

Field F2

Common Name	Latin Name	Present	Q1	Q2	Q3	Q4	Q5	Q6	DAFOR
Bramble	<i>Rubus fruticosus</i> agg.		3	2					R
Cocksfoot	<i>Dactylus glomerata</i>						1		R
Common Bent	<i>Agrostis capillaris</i>		10	25	15	25	5	10	F
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>		2	10	10	10	10	10	F
Common Chickweed	<i>Stellaria media</i>	P							R
Common Horsetail	<i>Equisetum arvense</i>	P							R
Common Knapweed	<i>Centaurea nigra</i>			12	2	5	10		O
Common Nettle	<i>Urtica dioica</i>	P							R
Common Ragwort	<i>Senecio jacobaea</i>					5			R
Common Sorrel	<i>Rumex acetosa</i>				<1				R
Creeping Bent	<i>Agrostis stolonifera</i>			5					R
Creeping Buttercup	<i>Ranunculus repens</i>		5		5	4	8		O
Creeping Thistle	<i>Cirsium arvense</i>	P							R
Crested Dogs tail	<i>Cynosaurus cristatus</i>	P							R
*Cuckoo-flower	<i>Cardamine pratensis</i>	P							R
Curled Dock	<i>Rumex crispus</i>	P							R
Foxglove	<i>Digitalis purpurea</i>	P							R
Great Burnet	<i>Sanguisorba officinalis</i>							30	R/LA
*Jointed Rush	<i>Juncus articulatus</i>						3		R
*Marsh Bedstraw	<i>Galium paulustre</i>	P							R
*Marsh Thistle	<i>Cirsium palustre</i>		15	10	20	12	12	5	F
Meadow Vetchling	<i>Lathyrus pratensis</i>		<1		1	2	2	1	O
Meadowsweet	<i>Filipendula ulmaria</i>	P							R
Oxeye Daisy	<i>Leucanthemum vulgare</i>						1		R
Red Fescue	<i>Festuca rubra</i>					5			LO
Ribwort Plantain	<i>Plantago lanceolata</i>				2	5			R
Scarlet Pimpernel	<i>Anagallis arvensis</i>	P							R
a sedge	<i>Carex</i> sp.		1	<1	2		3		R
Selfheal	<i>Prunella vulgaris</i>					<1	2		R
Sheep's Fescue [agg.]	<i>Festuca ovina</i> agg.				<1	5		5	R
Smooth Tare	<i>Vicia tetrasperma</i>						1		R
Spear Thistle	<i>Cirsium vulgare</i>	P							R
*Soft Rush	<i>Juncus effusus</i>		20	8	15	10	30	5	F
Sweet Vernal Grass	<i>Anthoxanthum odoratum</i>		5	5					LO
*Toad Rush	<i>Juncus bufonius</i>	P							R
Tormentil	<i>Potentilla erecta</i>	P							R
Tufted Hair-grass	<i>Deschampsia caespitosa</i>		15	20	15	5		15	F
White Clover	<i>Trifolium repens</i>		<1				1		R
*Wild Angelica	<i>Angelica sylvestris</i>			<1					R
a willowherb	<i>Epilobium</i> sp.		<1	<1	<1	<1			R
Yorkshire-fog	<i>Holcus lanatus</i>		10	5	15	5	3	5	O
Total No. Sp.			13	13	14	15	15	9	
No. Sp excluding those indicative of suboptimal conditions			10	12	12	13	13	9	

D: Dominant by 75-100% / A: Abundant by 25-74% / F: Frequent by 10-24% /

O: Occasional by 5-9% / R: Rare by <5%.

9 LWS mesotrophic grassland criteria (List F) species present, 4 are occasional or above

*LWS wet grassland criteria (List G) species present.

Field F3

Common Name	Latin Name	Present	Q1	Q2	Q3	Q4	Q5	DAFOR
Bramble	<i>Rubus fruticosus agg.</i>	P						R
Cock's-foot	<i>Dactylis glomerata</i>	P						R
Common Bent	<i>Agrostis capillaris</i>		25					R/LF
Common Bird's-foot-trefoil	<i>Lotus corniculatus</i>					2		R
Common Chickweed	<i>Stellaria media</i>	P						R
Common Knapweed	<i>Centaurea nigra</i>		10				5	O
a common mouse-ear	<i>Cerastium fontanum ssp. vulgare</i>		<1					R
Common Nettle	<i>Urtica dioica</i>	P						R
Common Ragwort	<i>Senecio jacobaea</i>		8			1		R
Common Sorrel	<i>Rumex acetosa</i>		1	2				R
Creeping Bent	<i>Agrostis stolonifera</i>		40	40	45	40	45	A
Creeping Buttercup	<i>Ranunculus repens</i>			10	5	5	5	O
Creeping Thistle	<i>Cirsium arvense</i>	P					2	R
Crested Dogs tail	<i>Cynosaurus cristatus</i>	P				<1		R
Dandelion	<i>Taraxacum officinale agg.</i>	P						R
Field Scabious	<i>Knautia arvensis</i>	P						R
Great Burnet	<i>Sanguisorba officinalis</i>			5	5		2	R
*Jointed Rush	<i>Juncus articulatus</i>	P						R
Meadow Buttercup	<i>Ranunculus acris</i>			5		1	3	R
Perennial rye grass	<i>Lolium perenne</i>				10		10	O
Red Fescue	<i>Festuca rubra</i>	P					2	R
Ribwort Plantain	<i>Plantago lanceolata</i>	P						R
a sedge	<i>Carex sp.</i>					5		R
*Toad Rush	<i>Juncus bufonius</i>			2	<1	5		R
Tormentil	<i>Potentilla erecta</i>		1	2	2	2		R
White Clover	<i>Trifolium repens</i>		10	3	5	35	4	O/LF
Yorkshire-fog	<i>Holcus lanatus</i>		5	30	15	5	15	F
Bare ground					10		5	O
Total No. Sp.			9	9	8	11	11	
No. Sp excluding those indicative of suboptimal conditions:			8	7	6	8	8	

D: Dominant by 75-100% / A: Abundant by 25-74% / F: Frequent by 10-24% /

O: Occasional by 5-9% / R: Rare by <5%.

8 LWS mesotrophic grassland criteria (List F) species present, 1 is occasional or above

Client: Beth Sydenham,
FPCR Environment and Design Limited



ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

Tel: 01159 229249
Email: Helen.Rees@adas.co.uk

www.adas.uk

Sample ID: ADAS-5438 Condition on Receipt: Low Sediment Volume: Passed
Client Identifier: P1, P12507 Description: pond water samples in preservative
Date of Receipt: 04/06/2024 Material Tested: eDNA from pond water samples

Determinant	Result	Method	Date of Analysis
Inhibition Control [†]	2 of 2	Real Time PCR	06/06/2024
Degradation Control [§]	Within Limits	Real Time PCR	06/06/2024
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	06/06/2024
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10 ⁻⁴ ng/μL) [#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	07/06/2024	Date of issue:	07/06/2024

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#] Additional positive controls (10⁻¹, 10⁻², 10⁻³ ng/μL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)