Ecological Impact Assessment



Cefn Way, Wrexham

27th March 2024

TG Report No. 13539_R05b_EG

Tyler Grange

Project No:	Report No.	Date	Revision
13539	R05b	27th March 2024	B

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Summary

S.1. This report has been prepared by Tyler Grange Group Ltd. (TG) on behalf of Harworth Group. It sets out the findings of ecological surveys in relation to a parcel of land at Cefn Way, Wrexham (OS Grid Reference SJ 3548 5092). The Proposed Development comprises a phased residential development for the construction of up to 900 residential dwellings with associated infrastructure (primary school, playing fields, open space and SUDs attenuation) with all matters reserved except for detailed means of primary highway access. The Proposed Development will be divided into 2 phases; Phase 1a comprises development in the north-west and south-west of the Site for up to 600 units. In addition, Phase 1b will comprise drainage and the reorientation of sports pitches. Phase 2 will comprise the development of the central area of the Site to provide an additional 300 units. The link road will also be provided in this phase, which does not extend past the northern Site boundary.

S.2. The eastern field (part of Phase 1a) shown as greyed out within **Figure 1.1** has been latterly added to the Site boundary, and as such, the ecological surveys completed to date do not encompass this area. The additional ecological surveys for this eastern area are currently being undertaken, and will be presented in a separate addendum report once complete. This eastern area is intended for flood compensation, with no units proposed. A habitat management plan will be produced for this flood compensation area, detailing the inclusion of ecologically sensitive planting. This eastern area is therefore not discussed within the report, expect when referenced as a location for potential ecological mitigation.

S.3. A total of 4 statutory and 3 non-statutory nature conservation sites were noted within the Zone of Influence around the Proposed Development, the closest of which being Cefn Park Local Wildlife Site (LWS) located approximately 830 m south-east of the Site. Any potential construction phase impacts on the designated sites could be mitigated for through the production and implementation of a Construction Environmental Management Plan (CEMP) for the Site.

S.4. Potential effects on sensitive acid bog habitat occurring at Borras Bog LWS located approximately 1 km to the north of the Site, potentially arising from a possible increase the deposition of airborne sources of nitrogen N0x have been assessed as likely being negligible. This is a result of the existing impact of the neighbouring A5156. However, this cannot be confirmed as it has not been specifically assessed to date.

S.5. None of the habitats within the Site were considered to be of greater than local ecological importance, of these hedgerows, ponds and broadleaved woodland are considered to be habitats of conservation concern under national or local biodiversity action. The pond, woodland and majority of the hedgerows, as well as the majority of the scattered trees will be retained through development. The development will primarily affect habitats of negligible ecological importance.

S.6. The majority of habitat loss relates to arable land of negligible ecological importance, with some smaller scale losses of hedgerow sections and boundary trees for access. Habitat losses are to be mitigated through the creation of new habitats which will be included within the landscape design of the development. Retained habitat features would be protected during the construction phase through implementation of a CEMP, which will identify buffer zones for the protection of habitats, and well as pollution prevention measures.

S.7. Both retained and newly created habitats would be the subject of a Landscape and Ecology Management Plan (LEMP) which will ensure habitats are managed and protected from incidental disturbance and habitat degradation due to lack of maintenance during operation of the Proposed Development.

S.8. The application of the masterplan will deliver a net benefit for biodiversity and provide strengthened connections to the wider landscape. This is through the general retention of habitats of local ecological importance, the protection of these retained habitats through development via a CEMP and AIA, the replacement of any habitats of local importance to be lost (a small number of trees and hedgerows), the enhancement of retained areas of habitat, and the creation of better habitats then are currently present on-site (neutral grassland) in strategically located positions. Thus delivering a more resilient and connected environment, whilst abiding by the step-wise approach, which is in line with recently adopted national policy (Chapter 6 PPW) and is detailed in the Green Infrastructure Statement included within this report.

S.9. Potential effects relating to protected/notable species from development of the Site comprise:

- Loss of terrestrial habitat and dispersal opportunities for GCN and other amphibians, further details of mitigation for habitat loss and to avoid killing / injury of GCN during the construction phase will need be provided and covered by an application for an EPS licence from NRW;
- Potential disturbance to commuting / foraging routes for bats would be mitigated through provision of new hedges which will link to other features such as woodland and hedges beyond the Site boundary, as well as ecologically sensitive planting provided around the SUDS in the east and along the 20 m sewer easement running through the centre of the Site, to be kept as dark areas to promote their use by foraging and commuting bats. A series of bat boxes on retained trees will also be provided, together with a sensitive lighting strategy to maintain dark corridors with and surrounding the Site, improving habitat resources for bats locally. No loss of roost locations is predicted;
- The provision of green infrastructure will maintain habitat resources for birds consisting of common woodland passerine species. Loss of potential nesting resources for lapwing arising as a result in the loss of arable land is not deemed to be significant, with further suitable habitat provided in the surrounding area;
- Recommendations for badger can be found within confidential Badger Survey Report **13539 R07**;
- During operation of the Proposed Development, implementation of the LEMP will ensure habitats for protected species are maintained; and
- Measures to prevent damage / disturbance to breeding birds, hedgehog and brown hare would also be set out in the CEMP.

S.10. Some ongoing survey / ecological assessment work is being undertaken in the spring of 2024, the findings of this will be presented in an addendum report. The update surveys will be used to refine the mitigation outlined above but is not expected to alter the overall findings of the EcIA summarised above.

S.11. It is therefore concluded that the Proposed Development will be compliant with relevant planning policies and legislation with regard to ecology, including a 'net benefit for biodiversity' in line with Planning Policy Wales.

Section 1: Introduction and Context

Introduction

1.1. This report has been prepared by Tyler Grange Group Ltd. (TG) on behalf of Harworth Group. It sets out the findings of ecological surveys in relation to a parcel of land at Cefn Way, Wrexham (OS Grid Reference SJ 3548 5092). The Proposed Development comprises a phased residential development for the construction of up to 900 residential dwellings with associated infrastructure (primary school, playing fields, open space and SUDs attenuation) with all matters reserved except for detailed means of primary highway access. The Proposed Development will be divided into 2 phases; Phase 1a comprises development in the north-west and south-west of the Site for up to 600 units. In addition, Phase 1b will comprise drainage and the reorientation of sports pitches. Phase 2 will comprise the development of the central area of the Site to provide an additional 300 units. The link road will also be provided in this phase, which does not extend past the northern Site boundary. The Phasing Plan and Illustrative Masterplan is provided in **Appendix 1**.

1.2. The eastern field (part of Phase 1a) shown as greyed out within **Figure 1.1** has been latterly added to the Site boundary, and as such, the ecological surveys completed to date do not encompass this area. The additional ecological surveys for this eastern area are currently being undertaken, and will be presented in a separate addendum report once complete. This eastern area is intended for flood compensation, with no units proposed. A habitat management plan will be produced for this flood compensation area, detailing the inclusion of ecologically sensitive planting. This eastern area is therefore not discussed further within the report, expect when referenced as a location for potential ecological mitigation.

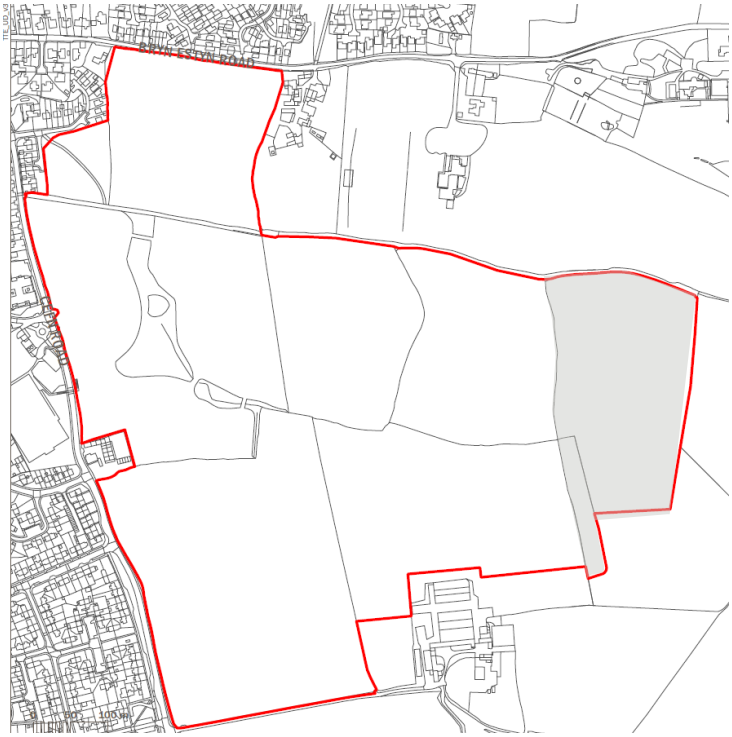


Figure 1.1: Site Boundary
Greyed out section-surveys to be completed in 2024 and included in addendum (Aerial Imagery © Google 2023)

Site Context

1.3. The wider site covers an area of 45.96 hectares and comprises mainly arable fields and amenity grassland in use as playing fields bordered by hedgerows and mature trees; public footpaths also cross the site at several points. Cefn Road runs along the western site boundary, and Bryn Estyn Road along the northern boundary. Residential development lies to the north and west of the site, and agricultural fields to the south and east. Wrexham Industrial Estate is located 1.1 km east of the site.

Purpose

1.4. This report:

- Uses available background data and results of the field surveys to describe and evaluate the ecological features present within the likely "Zone of Influence"[1] (ZoI) of the proposed development;
- Describes the actual or potential ecological issues and opportunities that might arise as a result of the site's development.
- Where appropriate, makes commitments for mitigation measures for adverse effects on ecological features as well as ecological enhancements, to ensure conformity with policy and legislation listed in **Appendix 2**; and
- Can be used to inform a planning application for the site's development.

1.5. This assessment and the terminology used are consistent with the Guidelines for Preliminary Ecological Appraisal[2] and the Guidelines for Ecological Impact Assessment[3]. A full methodology is set out in **Appendix 3**.

Methodology

1.6. Full methods for the data search, Phase 1/ UK Habs Survey, Preliminary Roost Assessment (PRA), Bat Activity Surveys, Breeding Bird Survey, and Great Crested Newt Surveys can be found in **Appendix 3.**

Quality Control

1.7. All ecologists at Tyler Grange Group Limited are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) or are working towards membership, and act under the direction of members and abide by the Institute's Code of Professional Conduct[4].

Limitations and Assumptions

1.8. No limitations were experience during the "Extended" Phase 1 Habitat Survey or data search. Any limitations experienced during the various protected species surveys are detailed within **Appendix 3.**

[1] Defined by the CIEEM (2018) Guidelines for Ecological Impact Assessment as the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries

[2] CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, 2nd edition. Chartered Institute of Ecology and Environmental Management, Winchester.

[3] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

[4] CIEEM (2022) Code of Professional Conduct, CIEEM, Winchester

Section 2: Ecological Features and Evaluation

Designated Sites

2.1. The data search was based on records purchased from North Wales Environmental Information Service (COFNOD), as well as data from the Multi-Agency Geographic Information for the Countryside (MAGIC). See **Appendix 3** for full methodology.

2.2. The data search returned four Natura 2000 sites within 10 km of the site, however, no national statutory designated sites. Three non-statutory designated sites are located within 2 km of the site. These are detailed in **Table 2.1** below.

Table 2.1: Designated Sites

Designated site	Distance and direction from site	Citation	Ecological Importance
Midland Meres and Mosses Phase 2B Ramsar	2.5 km southeast	Designated for the diverse range of habitats from open water to raised bog.	International
Johnstown Newt Sites Special Area of Conservation (SAC)	5.2 km north	The population of great crested newts Triturus cristatus is one of the largest known in Great Britain and has been the focus of much conservation management over the last few years. Breeding sites are provided in part by a mining subsidence pool, and natural water-filled hollows on clay, whilst other ponds have been created as part of nature conservation management. Terrestrial habitat varies from marshy grassland, grazed farmland and swamp through to scrub and broad-leaved woodland. Good populations of the widespread amphibian species are also present.	International
River Dee and Bala Lake SAC	5.8 km north	Designated for the presence of Annex I habitat 3260 *'Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation*' and the Annex II species Atlantic Salmon *Salmo salar* and floating water-plantain *Luronium natans*, along with the Annex II species Sea lamprey *Petromyzon marinus*, Brook lamprey *Lampetra planeri*, River lamprey *Lampetra fluviatilis*, bullhead *Cottus gobio* and otter *Lutra lutra.*	International
Berwyn and South Clwyd Mountains SAC	8.1 km south	Designated for the presence of Annex I habitats 4030 *'European dry heaths'* and 7130 *'Blanket Bogs'*, along with 6210 *'Semi-natural dry grasslands and scrubland facies on calcareous substrates*', 7140 *'Transition mires and quaking bogs*', 8120 *'Calcareous and calcshist screes of the montane to alpine levels*' and 8210 *'Calcareous rocky slopes with chasmophytic vegetation*'.	International
Cefn Park Local Wildlife Site (LWS)	830 m southeast	A series of broadleaved woodlands within Cefn Park Estate.	County
Borras Bog LWS	1 km north	An acid bog with birch canopy that is in excellent condition and unusual for the Wrexham area.	County
Errdig Estate LWS	1.5 km southeast	National Trust estate with woodlands, semi-improved neutral grasslands and marshes.	County

Habitats and Flora

2.3. The habitats present on-site are summarised below in **Table 2.2**, along with a description of the composition of the main plant species present and an assessment of their ecological importance. The location of habitats are shown on the Habitats Features Plan **13539/P01a**.

- Amenity grassland;
- Arable;
- Hedgerows;
- Invasive Non-native Species (Japanese knotweed);
- Pond;
- Scrub;
- Semi-natural broadleaved woodland and Scattered Trees; and
- Tall ruderals

Table 2.2: Habitats and Flora

Habitat	Description and Species	Ecological Importance	Photograph
Arable Land	A large proportion of the site is given over to arable crop production, mostly maize. At the time of the survey all fields had been harvested and left as stubble, except one in the south-east which was fallow.	This habitat is considered to be of **negligible ecological importance**.	
Amenity Grassland	Areas of amenity grassland are present towards the west of the Site, used as informal sports pitches and public recreation. All areas are maintained as short-mown grassland and are dominated by common grasses and forbs. The shortness of the sward made a full species record difficult, but species identified include cock's-foot Dactylis glomerata (A), white clover Trifolium repens (A), greater plantain Plantago lanceolata (F), dandelion Taraxacum officinale agg. (F), ragwort Senecio jacobaea (O) and chickweed Stellaria media (O).	This habitat type is of **negligible ecological importance**.	
Hedgerows	A network of hedgerows is present along field boundaries throughout the site. They vary in condition, but include examples of species-rich, intact hedgerows with mature trees. Most are dominated by hawthorn *Crataegus monogyna*, (D) or holly *Ilex europaeus* (A), but other species present include elder *Sambucus nigra* (F), hazel *Corylus avellana* (O), sycamore *Acer pseudoplatanus* (O), and pedunculate oak *Quercus robur* (O)	The hedgerows provide habitat connectivity through the site and to habitats beyond the site boundary and collectively are a priority habitat of **local ecological importance**.	

Habitat	Description and Species	Ecological Importance	Photograph
Invasive Non-native Species	A stand of Japanese knotweed *Reynoutria japonica* is present at the boundary of the amenity grassland in the west of the site.	This is of **negligible ecological importance**, but a strategy for treatment and/or removal will be required prior to development to adhere to current legislation (Schedule 8 of the WCA 1981).	
Pond	A pond is present within woodland at the west of the site. It is shallow and heavily shaded by woodland vegetation throughout the year. Very little aquatic or marginal vegetation is established, and the waterbody is full of leaf litter. It provides aquatic habitat that is not present elsewhere on the site and is therefore of ecological importance within the context of the site. It also provides breeding habitat for great crested newt (discussed below). A small and very shallow ephemeral pool was noted in the centre of the south-eastern parcel of arable land in May 2021, which subsequently dried up during the species surveys completed within the site.	This habitat is considered to be of **local ecological importance.**	
Scrub	Small areas of scrub are distributed through the site which include areas dominated by bramble *Rubus fruticosus* agg (D), and other areas of mixed scrub including hawthorn (A), holly (F), hazel (F) and blackthorn *Prunus spinosa* (O). An area of scrub is also present in the north of the site, which is dominated by coppiced willow *Salix sp.* (O).	The scrub is of **negligible ecological importance** but is likely to provide foraging and nesting opportunities for wildlife including birds and small mammals.	

Habitat	Description and Species	Ecological Importance	Photograph
Scattered Trees	A number of scattered mature trees are also present which are mostly located within the amenity grassland at the west of the site, with additional specimens present within some of the hedgerows. Species include pedunculate oak and sycamore.	Scattered Trees are of **local ecological importance.** The mature trees provide foraging and nesting habitat for a range of bird and bat species.	
Semi-natural broadleaved woodland	A block of semi-natural broadleaved woodland is located in the west of the site, at the centre of the amenity grassland area. The canopy is dominated by oak, with ash *Fraxinus excelsior* (F), silver birch *Betula pendula* (F), cherry *Prunus avium* (O) and hazel (O). The understorey is mostly holly (A) and hawthorn (A) and the field layer is dominated by common nettle *Urtica dioica*.	The broadleaved woodland is of **local ecological importance**. The woodland provides foraging and nesting habitat for a range of species, including birds and amphibians.	
Tall Ruderal	Several areas dominated by tall ruderal vegetation are present, mostly associated with arable field boundaries. Species include common nettle (A), hogweed *Heracleum spondylium* (F), cow parsley (F) and bracken *Pteridium aquilinum* (O).	The tall ruderal is of **negligible ecological importance** but is likely to provide foraging and nesting opportunities for wildlife including birds and small mammals.	

Adjacent Habitats

2.4. To the north of the Site is residential housing and amenity grassland associated with Wrexham Rugby Club, and to the west is also residential housing. Agricultural fields extend to the east and south, along with a woodland copse on the eastern Site boundary.

Protected and Notable Species

2.5. The below section sets out the potential for protected species on site, or results of detailed surveys where relevant. Species which are considered likely absent from the site based on professional judgement, following consideration of the habitats within the site, signs of species presence at the time of survey and data search records, are not discussed.

Amphibians

2.6. The data search returned records of common frog *Rana temporaria*, common toad *Bufo bufo*, smooth newt *Lissotriton vulgaris* and great crested newt (GCN) within 2 km of the Site. No European Protected Species (EPS) licences were returned for GCN within 2 km of the Site.

2.7. There is one pond located on the Site (Pond 6) and an additional six ponds within 250 m of the Site (Pond 1 to Pond 5 and Pond 7). Presence/Absence Surveys using a combination of eDNA, bottle trapping and torching were undertaken on all ponds in May and June 2021. The surveys confirmed GCN presence in the on-site pond (Pond 6) and three ponds (Pond 3, Pond 4 and Pond 5) lying to the north of the Site. Detailed survey results for GCN can be found in **Appendix 3** and are shown on **Plan 13539/P04**.

2.8. Although the results of the Presence/Absence Surveys would indicate that only a small GCN metapopulation (i.e. 1-10 individuals) exists across the ponds surveyed, based on previous surveys in the area and known GCN distribution across Wrexham, it is considered that the ponds form part of a single medium-sized metapopulation.

2.9. The terrestrial habitat within the Site of suitability to GCN is the woodland containing Pond 6 and the connecting hedgerows through the Site and associated field margin vegetation, which also provide connectivity to the wider landscape. The majority of the Site however comprises intensive agricultural land/short-mown playing fields. Whilst GCN would not be reliant on these habitats for sustaining the metapopulation present, the species will inevitably cross such habitat when dispersing through the landscape.

2.10. Other more mobile amphibian species such as common toad and common frog may be present within habitats on-site, such as the hedgerows and woodland, and may breed within the on-site pond. Common toads are a priority species under the Environment Act (Wales) 2016.

2.11. Overall, the population of GCN supported by the Site is considered to be of **local ecological importance**. The habitats within the Site are considered to be of **local ecological importance** for common amphibians, however similar habitat is present within the surrounding area.

Badgers

2.12. Results for badger can be found within confidential Badger Survey report **13539 R07.**

Bats

2.13. The data search returned records for eight bat species within 2 km of the Site. Species included common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctul*a, brown long-eared *Plecotus auratus*, Daubenton's *Myotis daubentonii*, Brandt's *Myotis brandtii*, whiskered *Myotis mystacinus*, and lesser horseshoe *Rhinolophus hipposideros*. The nearest of these was a record of common pipistrelle approximately 200 m south of the Site in 2016. The data search also retuned records from 2019 of a known lesser horseshoe maternity roost present within the Erlas Victorian Walled Garden estate approximately 260 m north of the Site.

2.14. The wider Site offers roosting opportunities for bats within the mature trees. To date, a PRA of the trees in Phase 1 of the development has been completed and eights trees were subsequently surveyed via an Arial Inspection in 2022. Tree 3 and Tree 4 retained High bat roosting potential, Tree 1, Tree 6 and Tree 8 retained Moderate bat roosting potential, and Tree 28 retained Low bat roosting potential. Tree 2 and Tree 20 were downgraded to Negligible bat roosting potential (tree reference numbers taken from the Arboricultural Impact Assessment (AIA) **13539_R01c**). The trees were reinspected in 2023 and the roosting suitability of these eight trees remained the same.

2.15. Consulting the AIA, of the trees that retained roosting potential, only Tree 28 (Low bat roosting potential) would require removal to facilitate development according to the Illustrative Masterplan. However, as the assessment has only been completed for the outline scheme, final tree loss is yet to be confirmed, and in addition the trees in further phases of the development have not been assessed for potential to support roosting bats. As such, additional bat surveys may be required once detailed tree loss is known to confirm the importance of the roosting bat assemblage within the Site.

2.16. The Site largely comprises arable and amenity grassland, of limited value to foraging bats. The habitats of highest importance for foraging and commuting bats within the Site include the hedgerows, woodland and pond, as confirmed during the Bat Activity Surveys and Static Detector Surveys conducted in 2021 and 2023 (detailed survey results for bats can be found in **Appendix 3**, and are shown on **Plan 13539/P06a**). The habitats within the Site are common in the local area.

2.17. Activity relating to the more light-intolerant species, i.e. Myotis species and lesser horseshoe, was also recorded adjacent to the woodland and pond area in the west. The Site is located within the core sustenance zone (CSZ) of the lesser horseshoe maternity roost located within Erlas Victorian Walled Garden estate approximately 260 m north of the Site. Four passes in 2023 and 2 passes in 2021 of lesser horseshoe were recorded during the Static Detector Surveys and no passes of the species were recorded on any Activity Surveys in 2023 or 2021. Consulting the AIA, the outline Illustrative Masterplan would only require small sections of hedgerow loss for access. However, it is understood that further bat surveys may be required once final hedgerow and vegetation loss is known, to fully assess the impact of the development on foraging and commuting bats.

2.18. Overall, the assemblage of bats utilising the Site for foraging and commuting is considered to be **of local ecological importance**.

Birds

2.19. The data search by COFNOD confirmed the presence of a large number of bird species in the surrounding area, which are expected given the habitats present. The majority were common urban/suburban species, with records of Schedule 1 species also returned. No evidence of such Schedule 1 species was noted within the Site during the surveys completed, however, the Site does provide some suitable habitat for nesting Hobby *Falco subbuteo*. Other Red/Amber list species were also identified but they were not recorded during the surveys completed within the Site. A summary of bird species found to be using the Site for breeding when surveyed in 2021 is provided in **Appendix 3** and are shown on **Plan 13539/P03**.

2.20. Following the Breeding Bird Surveys, is was concluded that the principal ornithological value of the Site for nesting is within the boundary vegetation comprising hedgerow and scrubby margins, which were noted to support probable breeding from a number of birds of conservation concern and other 'green list' species. The central woodland copse within the Site was also noted to support a wide range of both amber and green list species. The arable fields also provide value for two or three pairs of breeding lapwing *Vanellus vanellus*, recorded as the only red listed probable breeders within the Site.

2.21. Whilst the playing fields within the Site offer no suitable habitat for nesting, up to 50 starlings *Sturnus vulgaris* (a combination of adults and juveniles) were recorded foraging in the playing fields, which are therefore considered to be important in maintaining bird populations locally for those species which utilise such grassland for foraging and rearing young, principally starling and thrushes.

2.22. Overall, the population of breeding birds the Site supports is considered to be of **local ecological importance**.

Hedgehog

2.23. Numerous records of hedgehog *Erinaceus europaeus* were returned close to Site and in the wider area, the closest of which was approximately 24 m from the Site. Hedgerows, woodland habitat and other areas of dense ground cover within the Site would provide suitable habitat for hedgehogs. However, the majority of the Site comprises arable and amenity grassland of limited value to hedgehog. Overall the Site is considered to be of **local ecological importance** for hedgehog.

Reptiles

2.24. Two records of grass snake *Natrix helevetica* were returned from 2010 and 2016, approximately 1.2 km from the Site. Records for adder *Vipera berus*, slow worm *Anguis fragilis* and common lizard *Zootoca vivipara* were all returned in the wider landscape but were close to the 2 km buffer.

2.25. There is some limited habitat suitable for reptiles within the Site, such as along field margins, where a longer grassland sward, scattered scrub and tall ruderals are present. However, this is very limited in extent and is mostly located around the amenity areas of the Site, which are subject to a high level of human disturbance. It is considered the likelihood of reptiles being present on-site is low and therefore, will **not be discussed further**.

Otter and Water Vole

2.26. A single record of water vole *Arvicola amphibius* was returned from the data search, located within the River Gwenfro approximately 840 m west of the Site. Six records of otter *Lutra lutra* were returned, the closest of which was located 790 m west of the Site in Caia Park. The majority of the otter records were of deceased individuals from road traffic collisions in the wider area. No rivers, streams or suitable habitat for either of these species is present on-site, and they therefore will **not be discussed further**.

Other Species

2.27. Five records for European hare *Lepus europaeus* were returned in the data search within the last ten years. The closest of which was approximately 330 m from the Site boundary in 2019. The Site does provide some suitable habitat for the species, however, the species was not observed on-site during any of the Site surveys over multiple years. The Site is considered to have **negligible ecological importance** for maintaining brown hare populations, however due to the proximity and relative recency of the adjacent record, Precautionary Working Methods to protect the species are advised.

2.28. Five records of polecat *Mustela putorius* were returned in the data search. All of these were in excess of approximately 1.5 km from the Site, and associated with the Wrexham industrial park wildlife site. The Site is therefore considered to have **negligible ecological importance** for maintaining polecat populations and is not discussed further.

Section 3: Ecological Impacts, Mitigation, and Enhancement

Proposed Development

3.1. The Proposed Development comprises a phased residential development for the construction of up to 900 residential dwellings with associated infrastructure (primary school, playing fields, open space and SUDs attenuation) with all matters reserved except for detailed means of primary highway access. The Proposed Development will be divided into 2 phases; Phase 1a comprises development in the north-west and south-west of the Site for up to 600 units. In addition, Phase 1b will comprise drainage and the reorientation of sports pitches. Phase 2 will comprise the development of the central area of the Site to provide an additional 300 units. The link road will also be provided in this phase, which does not extend past the northern Site boundary. The Phasing Plan and Illustrative Masterplan is provided in **Appendix 1**.

3.2. Ecological issues associated with the Proposed Development include the loss of foraging and potential roost habitat for bat species, loss of nesting and foraging habitat for birds, potential loss of foraging habitat for badgers and hedgehogs, the fragmentation of a medium sized meta population of GCN across the wider area and the potential spread of invasive species (Japanese knotweed).

Designated Sites

Statutory Sites

3.3. Four European sites – Midland Meres and Mosses Phase 2B Ramsar, River Dee and Bala Lake SAC, Johnstown Newt Sites SAC and Berwyn and South Clwyd Mountains SAC – are present within the ZoI. Given the nature of the site proposals and the distances involved between the site and Ramsar and SACs, and lack of hydrological connections, no adverse direct or indirect effects are anticipated on the statutory sites, and no specific mitigation is required.

Non-statutory Sites

3.4. Three LWSs are within proximity of the Proposed Development. Due to the lack of access within the LWS, or the distance from the site to the LWS, negative impacts from increased visitor pressure are not anticipated as a result of development.

3.5. The operation of the Site, could theoretically increase air pollutant emissions (deposition of NOx for airborne sources) resulting in possible adverse impacts on habitats for which Borras Bog LWS is designated i.e. acid bog, However, the location of the LWS immediately adjacent to the A5156, means the LWS is already likely to experience some significant effects on habitats as a result of NOx deposition, which is likely to mean the potential impacts from increases in NOx deposition from the Proposed Development are likely to be negligible. However, as specific modelling of this has not been completed to date, this cannot be confirmed.

3.6. Impacts during construction activities could potentially occur to the surrounding LWS via dust deposition and run-off. However these potential impacts during the construction phase can be controlled through best practice pollution prevention measures, which can be implemented in a Construction Environmental Management Plan (CEMP).

Habitats and Flora

3.7. Current development proposals include the retention of the vast majority of the hedgerows and scattered trees through and surrounding the Site, and the complete retention of the on-site pond and woodland copse, which comprise the habitats of local ecological importance within the site. Overall, the native planting of trees, shrubs, and grassland is expected to improve the site overall for biodiversity

3.8. Potential impacts to retained hedgerows and trees may occur during construction resulting from issues including inadvertent damage, or inappropriate storage of materials. Potential impacts to retained habitats of ecological importance, including inadvertent damage or degradation, pollutant run-off and inappropriate storage of materials will be mitigated through the implementation of an Arboricultural Method Statement (AMS) and CEMP. Measures to mitigate any losses to hedgerow units onsite include hedgerow planting.

3.9. Invasive non-native species are present in the western side of site and mitigation will be required to control the potential spread of these species beyond the site boundary to ensure compliance with legislation. An appropriate management strategy for removal and/or treatment of invasive non-native species (including Japanese knotweed) to control their spread beyond the site boundary should be devised and implemented by a specialist contractor prior to the commencement of site clearance or construction activities.

3.10. A Landscape and Ecological Management Plan (LEMP) should be devised and implemented to ensure success and long-term viability of retained and newly created habitats.

Protected and Notable Species

Amphibians

3.11. Current development proposals include the retention of the pond used by breeding GCN, as well as the surrounding woodland copse, maintaining breeding habitat within the Site. In addition, the vast majority of the hedgerows will be retained to allow the species to commute through the Site. The sports pitches surrounding the on-site pond and badger Sett 2 on the northern-eastern Site boundary will be retained, allowing continued access to the wider GCN population within the three ponds (Pond 3, Pond 4 and Pond 5) lying to the north of the Site.

3.12. The proposed eastern SUDS features in Phase 1b, could also be improved for GCN through appropriate design, with ecologically sensitive planting included in associated with the SUDs which, if designed and managed correctly including opportunities for hibernation/refuge, could introduce more suitable terrestrial habitat than is currently present. A suitable LEMP or Ecological Enhancement Plan should be created to ensure the long-term management of the retained and proposed habitats.

3.13. To ensure GCN are not dissuaded from commuting around the Site, and to further breeding ponds to the north-east, a Lighting Plan should be produced detailing the creation of dark corridors through the Site. These dark corridors should include the hedgerows through and surrounding the Site, the retained badger setts, the woodland copse and pond, the sports pitches (especially those connecting the woodland copse and Sett 2), the SUDS area in the east of the Site and the approximate 20 m sewer easement, which will include ecologically sensitive planting.

3.14. The CEMP should include Precautionary Working Methods to protect common amphibians during the construction phase, including a check for the species group by a SQE during clearance of suitable habitat.

3.15. A great crested newt licence will be required from Natural Resources Wales to mitigate the loss of GCN terrestrial habitat within 250 m of breeding ponds and reduce the risk of killing/injuring individuals. The Receptor site for Phase 1 would be the woodland surrounding Pond 6. For phase 2, this could be the eastern SUDS area within Phase 1b.

Outline Mitigation Strategy

3.16. The below process will need to be implemented per development phase. Starting with Phase 1, the whole phase will need to be enclosed with the use of Temporary Amphibian Fencing (TAF). The fencing can only be installed in the 'active' season for GCN (i.e. between March and October). Once the fencing is in place, a 60-day trapping period will commence based on the presence of a medium-sized metapopulation and in line with mitigation guidelines. This will comprise installing buckets sunk into the ground on the inside of the fenceline, and checking these buckets on a daily basis for a 60-day period, with any GCN or amphibians caught moved off-site to a receptor area. For Phase 1, this will be the woodland surrounding Pond 6. Once the 60-day period is over (and with a period of 5 days of no GCN caught at the end), development works can commence, with the TAF maintained and monitored for the duration of the construction period. Only when all development works are complete in Phase 1 (or any other phase) can the fencing be removed and GCN allowed to move through the developed site. It may also be necessary for destructive searches of certain areas to be undertaken during the 60-day exclusion period to facilitate the exclusion efforts. This will be at the discretion of the licensed ecologist.

3.17. The remaining phases will proceed in the same fashion and any GCN caught relocated to the most suitable receptor site, for Phase 2 this could be the eastern SUDS area within Phase 1b.

3.18. As there is no loss of breeding habitat for GCN associated with the development, there is no recommendation for replacement pond features in any phase. The proposals across all phases account for the creation of SUDs features, which will offer some limited suitability for GCN if designed appropriately. Across all phases, there is also the ability to create GCN hibernacula around SUDs features to provide additional opportunities for hibernation/refuge.

3.19. It is considered, overall, that the loss of terrestrial habitat overall across all phases would not be significant and therefore would not require significant amounts of mitigation. The areas of grassland planting associated with SUDs features in Phase 1b, if designed and managed correctly could introduce more suitable terrestrial habitat than is currently present.

3.20. The detailed design for each phase must also ensure that the risk of amphibian mortality is reduced in the operational phase of development by introducing modified kerbs around gulley pots in the site.

Badger

3.21. Recommendations for badger can be found within confidential Badger Survey report **13539 R07.**

Bats

3.22. The retention of the mature scattered trees will provide continued roosting opportunities for bats through development. The retention of the trees, as well as the hedgerows, woodland and pond will also preserve the highest value habitats for foraging and commuting bats on-site.

3.23. The AIA (reference **13539_R01c**) details that only one tree with bat roosting potential in Phase 1 will require removal, Tree 28, which has Low bat roosting potential. Tree 28 must therefore be section-felled in the presence of a SQE. Should plans for Phase 1 change, and High or Moderate bat roosting potential trees require removal, the trees to be removed must be subject to Aerial Inspections or Nocturnal Surveys. With regards to Phase 2, a PRA (and potential further surveys) will be required for all trees to be lost in Phase 2. The detailed results and mitigation measures resulting from the further surveys and PRA should be detailed as part of the reserved matters application for each phase on the Site. A series of bat boxes should be installed in each phase to mitigate the loss of any potential roost features.

3.24. The majority of hedgerows will be retained on-site, however the small areas of hedgerow loss should be replaced within the Site, using native species in ecologically strategic locations to improve bat commuting habitat.

3.25. To ensure bats are not dissuaded from commuting around the Site, or cut off from foraging habitat within/surrounding the Site, a Lighting Plan should be produced detailing the creation of dark corridors through the Site. These dark corridors should include the hedgerows through and surrounding the Site, the retained badger setts, the woodland copse and pond, the sports pitches (especially those connecting the woodland copse and Sett 2), the SUDS area in the east of the Site and the approximate 20 m sewer easement, which will include ecologically sensitive planting. The CEMP should also detail that these areas should be kept as dark areas during construction and include sensitive construction lighting.

3.26. The Site is located within the CSZ of the lesser horseshoe maternity roost located within Erlas Victorian Walled Garden estate approximately 260 m north of the Site. As the Site largely provides habitat of low foraging value i.e. arable land, it is assumed the species generally commute east to forage. The Proposed Development details the general retention of the higher value foraging habitats (woodland, pond, hedgerows), with the loss of the arable land, and as such only sub-optimal foraging habitat within the CSZ to be lost in both Phase 1 and Phase 2. To mitigation this loss of sub-optimal foraging habitat, the eastern SUDS area in Phase 1b with be planted sensitively for ecology, and maintained as a dark area, to provide higher value foraging habitat within the CSZ then is currently present. This is deemed sufficient mitigation for both phases.

Birds

3.27. All birds, their nests and eggs, are protected by law and as such it is an offence to intentionally kill, injure, or take any wild bird; intentionally take, damage, or destroy the nest of any wild bird while it is in use or being built; and intentionally take or destroy the egg of any wild bird.

3.28. The general retention of the woodland, scattered trees and hedgerows will preserve nesting habitat for passerine species within the Site. The amenity grassland pitches important locally for foraging starling and thrushes will also be retained.

3.29. To avoid triggering the legislation protecting nesting birds, clearance of suitable habitat (arable fields, trees, and hedgerow) should be timed outside the nesting bird season (generally taken as March to September inclusive, though this is not defined in law and birds may nest outside of this time). If any clearance works to nesting habitats are required during the nesting season, then pre-removal checks for nesting birds must be carried out by a suitably experienced Ecological Clerk of Works (ECoW), no more than 48 hours prior to the works commencing. If any nesting birds are found to be present, an appropriate buffer zone will be implemented, within which works are excluded for the duration of the breeding attempt. Any active nests will need to be left in-situ until a suitably experienced ecologist confirms that the chicks have fledged and the nest is no longer active.

3.30. The majority of scattered trees and hedgerows will be retained on-site, however the small areas of loss should be replaced within the Site, using native species in ecologically strategic locations to improve bird nesting habitat. A series of bat boxes should also be included within each Phase to provide further nesting opportunities.

3.31. The Proposed Development of both phases would result in the loss of habitat which supports up to three pairs of breeding lapwing, loss of suitable arable habitat used by the three lapwing territories is unlikely to be significant in maintaining populations locally, as there will be regular changes in farmland use locally. This means the species is unlikely to show specific fidelity to arable habitat within the Site for breeding. In addition, the wider landscape contains large areas of similarly suitable habitat for this species to move into. However, mitigation will also be provided on-site in the eastern SUDS area of Phase 1b, which will be planted and managed to consider nesting lapwing, and in turn also benefit a wide range of other bird species should the SUDS features also be ecologically designed. This area is deemed sufficient mitigation or both phases.

Hedgehog

3.32. The general retention of the woodland and hedgerows will provide foraging and commuting habitat for hedgehog post development.

3.33. Hedgehog are a priority species and therefore afforded consideration in planning policy. Hedgehog are in population decline, efforts should be made to conserve this species and enhance sites for hedgehog wherever possible, by creating 'hedgehog highways' (appropriately sized gaps under boundary fencing to allow the free movement of hedgehog), including a series of hedgehog houses in the Proposed Development and implementing safe working methods, such as:

- Storing construction materials in skips or off the ground in pallets where possible;
- Ensuring any excavations are sealed overnight, or left ramped or with an exit should any hedgehogs or other small mammals become trapped;
- Capping any pipework overnight, and;
- Vegetation which could provide suitable habitat for sheltering hedgehog should be checked by and ecologist prior to vegetation clearance.

Brown Hare

3.34. The CEMP should include Precautionary Working Methods to protect brown hare during the construction phase, including a check for the species by a SQE during clearance of suitable habitat.

Section 4: Green Infrastructure Statement

4.1. Version 12 of PPW includes requirements for '*Net benefit for Biodiversity and Step-wise Approach*'. Application of the mitigation hierarchy/step-wise approach is fundamental to the ecological impact assessment process. This requires consideration of the following measures, in order of priority, for all potential impacts, to determine the most appropriate mitigation, compensation and enhancement strategy for the project. This is set out below:

- Avoid
- Minimise
- Mitigate/restore
- Compensate on-site
- Compensate off-site

4.2. The PPW states that 'a green infrastructure statement should be submitted with all planning applications. This will be proportionate to the scale and nature of the development proposed and will describe how green infrastructure has been incorporated into the proposal… The green infrastructure statement will be an effective way of demonstrating positive multi-functional outcomes which are appropriate to the site in question and must be used for demonstrating how the step-wise approach has been applied.'

4.3. The following section therefore comprises the Green Infrastructure Statement and includes how Net benefit for Biodiversity and the Step-wise Approach has been incorporated on-site.

Net Benefit for Biodiversity and the Step-wise Approach

4.4. The proposed development will largely affect habitats of negligible ecological importance, such as arable land, amenity grassland, scrub and tall ruderal, which requires no specific mitigation for its loss and which would have limited impact on fauna which use it. As such, in accordance with the step-wise approach, impacts to flora and fauna are therefore avoided/minimised as far as possible. Where negligible ecological importance habitats may be of use to protected species, mitigation to protect the species is recommended, such as nesting bird checks of the arable land, scrub and tall ruderal if removed in nesting bird season to protect breeding birds, and a pre clearance check of the scrub and tall ruderal for common amphibians and hedgehog, as detailed in **Section 3** of this report.

4.5. Those habitats within the site which have been identified as being of 'local' ecological importance and/or priorities for conservation under Section 7 of the Environment (Wales) Act 2016 are those which the step-wise approach seeks to address. In the context of the site, these habitats are:

- Broadleaved woodland;
- Scattered trees;
- Hedgerows;
- Pond

4.6. Current development proposals include the complete retention of the on-site pond and woodland copse. In addition, the vast majority of the hedgerows and scattered trees through and surrounding the Site will be retained, avoiding impacts to flora and fauna through development. To protect the retained habitats within the site, a CEMP and AIA will be produced for all phases, to include standard pollution control measures to protect retained habitats during construction.

4.7. Approximately 180 m of hedgerow and three category C trees and one category U tree will require removal, primarily for access, as detailed on the Arboricultural Impact Assessment **13539/R01c.** The loss of habitats of local ecological importance is therefore minimised. To mitigate and restore these lost habitats on-site, additional tree and hedgerow planting has been incorporated into the proposed masterplan, to be included in a LEMP to ensure their longevity on-site.

4.8. The masterplan also ensures the retained and restored habitats maintain their connection to the wider landscape through green corridors within the site, allowing them to retain functionality and resilience as habitats in their own right and to the fauna which uses them. The green corridors on-site include the hedgerows through and surrounding the Site, the retained badger setts, the woodland copse and pond, the sports pitches (especially those connecting the woodland copse and badger Sett 2), the SUDS area in the east of the Site and the approximate 20 m sewer easement, which will include ecologically sensitive planting. These areas are to be maintained as dark areas during and post construction so fauna are not dissuaded from using them.

4.9. The retained habitats will also be enhanced, for example through additional woodland planting adjacent to the retained woodland copse to increase cover of the habitat on-site. This enhancement will assist with creating a biodiversity net benefit on-site.

4.10. Beyond the retention, protection and enhancement of existing ecological features within the site, the masterplan also seeks to create better habitats then are currently present on-site, effectively providing a biodiversity net benefit to flora and fauna on-site. Widespread tree, scrub and shrub planting is proposed, along with strategically located habitat provision. This includes an area of neutral grassland surrounding the SUDs features in the east of the site, with the SUDs designed sensitively for ecology. A 20 m sewer easement running through the centre of the site will also be planted for ecology, through the inclusion of neutral grassland and scrub/tree planting. The 30 m buffers surrounding the badger setts could also enhanced through sensitive planting under the supervision of an ecologist. These proposed features offer net benefits for a range of flora and fauna and provide ‘stepping stones’ through the site to ensure habitats remain connected.

4.11. Overall, it is considered that with the implementation of the masterplan as presented, the development has the ability to deliver a net benefit for biodiversity through the retention and enhancement of existing green infrastructure and creation of new habitat to provide strengthened connections to the wider landscape, thus delivering a more resilient and connected environment whilst abiding by the step-wise approach.

Section 5: Conclusions

Statutory Sites

5.1. A total of 4 statutory and 3 non-statutory nature conservation sites were noted within the Zone of Influence around the Proposed Development, the closest of which being Cefn Park LWS located approximately 830 m south-east of the Site. Any potential construction phase impacts on the designated sites could be mitigated for through the production and implementation of a CEMP for the Site.

5.2. Potential effects on sensitive acid bog habitat occurring at Borras Bog LWS located approximately 1 km to the north of the Site, potentially arising from a possible increase the deposition of airborne sources of nitrogen N0x have been assessed as likely being negligible. This is a result of the existing impact of the neighbouring A5156. However, this cannot be confirmed as it has not been specifically assessed to date.

Habitats

5.3. None of the habitats within the Site were considered to be of greater than local ecological importance, of these hedgerows, ponds and broadleaved woodland are considered to be habitats of conservation concern under national or local biodiversity action. The pond, woodland and majority of the hedgerows, as well as the majority of the scattered trees will be retained through development. The development will primarily affect habitats of negligible ecological importance.

5.4. The majority of habitat loss relates to arable land of negligible ecological importance, with some smaller scale losses of hedgerow sections and boundary trees for access. Habitat losses are to be mitigated through the creation of new habitats which will be included within the landscape design of the development. Retained habitat features would be protected during the construction phase through implementation of a CEMP, which will identify buffer zones for the protection of habitats, and well as pollution prevention measures.

5.5. Both retained and newly created habitats would be the subject of a LEMP which will ensure habitats are managed and protected from incidental disturbance and habitat degradation due to lack of maintenance during operation of the Proposed Development.

5.6. The application of the masterplan will deliver a net benefit for biodiversity and provide strengthened connections to the wider landscape. This is through the general retention of habitats of local ecological importance, the protection of these retained habitats through development via a CEMP and AIA, the replacement of any habitats of local importance to be lost (a small number of trees and hedgerows), the enhancement of retained areas of habitat, and the creation of better habitats then are currently present on-site (neutral grassland) in strategically located positions. Thus delivering a more resilient and connected environment, whilst abiding by the step-wise approach, which is in line with recently adopted national policy (Chapter 6 PPW) and is detailed in the Green Infrastructure Statement included within this report.

Protected and Notable Species

5.7. Potential effects relating to protected/notable species from development of the Site comprise:

- Loss of terrestrial habitat and dispersal opportunities for GCN and other amphibians, further details of mitigation for habitat loss and to avoid killing / injury of GCN during the construction phase will need be provided and covered by an application for an EPS licence from NRW;

- Potential disturbance to commuting / foraging routes for bats would be mitigated through provision of new hedges which will link to other features such as woodland and hedges beyond the Site boundary, as well as ecologically sensitive planting provided around the SUDS in the east and along the 20 m sewer easement running through the centre of the Site, to be kept as dark areas to promote their use by foraging and commuting bats. A series of bat boxes on retained trees will also be provided, together with a sensitive lighting strategy to maintain dark corridors with and surrounding the Site, improving habitat resources for bats locally. No loss of roost locations is predicted;

- The provision of green infrastructure will maintain habitat resources for birds consisting of common woodland passerine species. Loss of potential nesting resources for lapwing arising as a result in the loss of arable land is not deemed to be significant, with further suitable habitat provided in the surrounding area;

- Recommendations for badger can be found within confidential Badger Survey report **13539 R07**;

- During operation of the Proposed Development, implementation of the LEMP will ensure habitats for protected species are maintained; and

- Measures to prevent damage / disturbance to breeding birds, hedgehog and brown hare would also be set out in the CEMP.

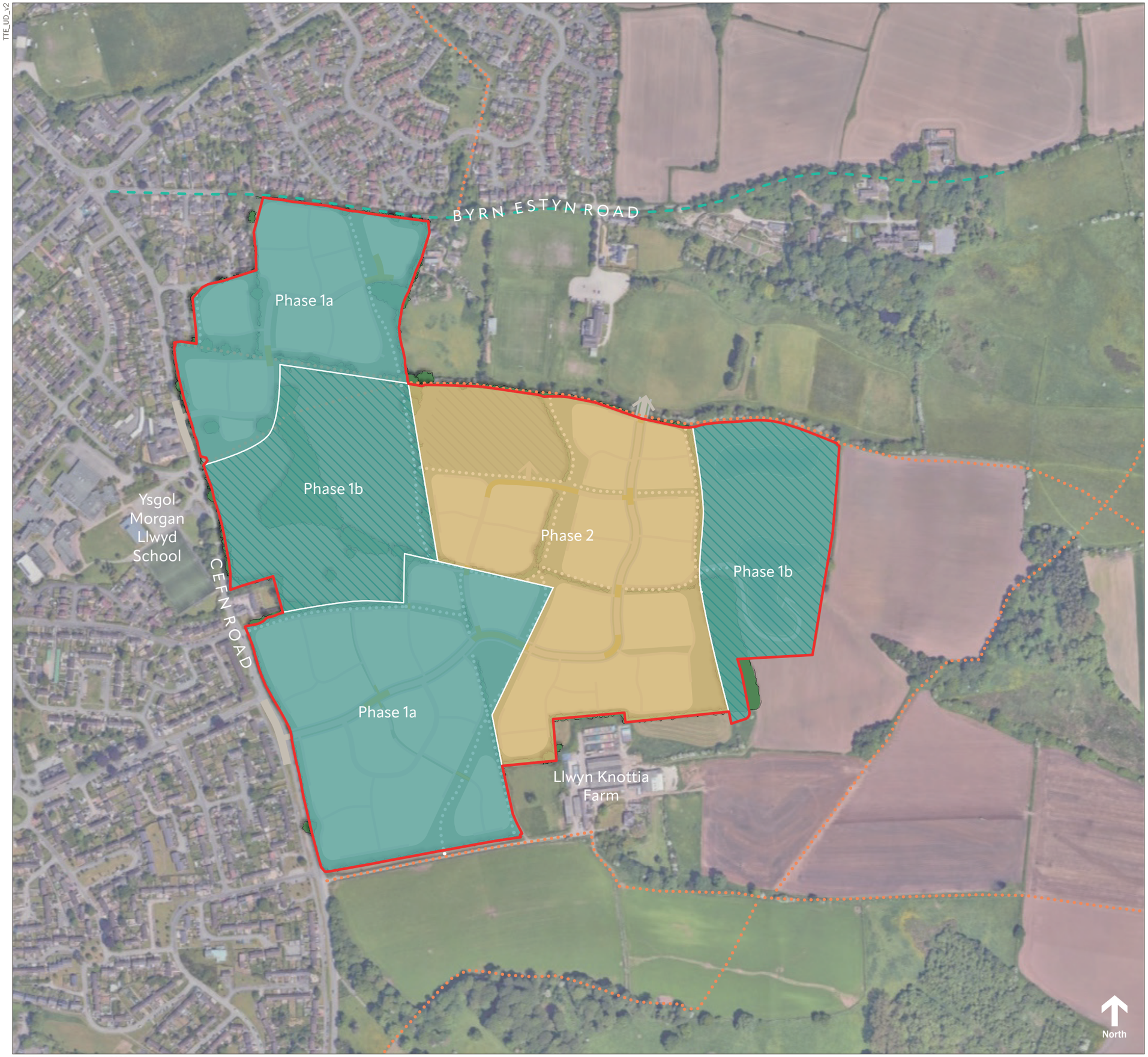
5.8. Some ongoing survey / ecological assessment work is being undertaken in the spring of 2024, the findings of this will be presented in an addendum report. The update surveys will be used to refine the mitigation outlined above but is not expected to alter the overall findings of the EcIA summarised above.

Appendix 1: Proposed Site Plan

Illustrative Masterplan

Phasing Plan

TTE_UD_v2



Aerial image: © Google Earth 2022

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KEY

- Site boundary
- Phase 1a (approx. 532 dwellings)
- Phase 1b*
- Phase 2 (approx. 368 dwellings)

*to address drainage strategy and re-orientation of sports pitches

Document control

-	-	-	-	-	-
P03	changes following client feedback	30.01.24	EI	BR	AC
P02	Revised based on updated parcel division plan	19.01.24	LR	BR	AC
P01	Issue for phasing meeting	16.01.24	LR	BR	AC
Rev	Description	Date	Dwn	Chk	App

Erlas Park Wrexham

Harworth Group

PHASING PLAN

TTE Proj No	Drwn | Date	Checked | Date	Appr'd | Date	Scale @ A3	Suitability
B024030	LR | Jan '24	BR | Jan '24	AC | Jan '24	1:5000	S0

Client Proj No	Originator	Vol/System	Level/Location	Type/Code	Role	Number	Revision
-	TTE	00	XX	DR	UD	41	P03

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Aerial image: © Google Earth 2022

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KEY

Site boundary

Document control

P02	Annotations added. Proposed pitches removed.	25.03.24	LR	AC	AC
P01	Initial issue	22.03.24	LR	AC	AC
Rev	Description	Date	Dwn	Chk	App

Erlas Park Wrexham

Harworth Group

ILLUSTRATIVE MASTERPLAN

TTE Proj No	Drwn | Date	Checked | Date	Appr'd | Date	Scale @ A3	Suitability
B024030	LR | Mar '24	AC | Mar '24	AC | Mar '24	1:5,000	S0

Client Proj No	Originator	Vol/System	Level/Location	Type/Code	Role	Number	Revision
-	TTE	00	XX	DR	UD	47	P02

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Appendix 2: Legislation and Planning Policy

Legislation

A2.1. Specific habitats and species receive legal protection in the UK under various pieces of legislation, including:

- The Environment Act 2021;
- The Wildlife and Countryside Act (WCA) 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- The Countryside and Rights of Way (CRoW) Act 2000;
- The Natural Environment and Rural Communities Act (NERC) 2006;
- The Hedgerows Regulations 1997; and
- The Protection of Badgers Act 1992.

A2.2. The European Council Directive on the Conservation of Natural Habitats and of Wild Flora and Fauna, 1992, often referred to as the 'Habitats Directive', provides for the protection of key habitats and species considered of European importance. Annexes II and IV of the Directive list all species considered of community interest. The legal framework to protect the species covered by the Habitats Directive has been enacted under UK law through The Conservation of Habitats and Species Regulations 2017 (as amended).

A2.3. In Britain, the WCA 1981 (as amended) is the primary legislation protecting habitats and species. SSSIs, representing the best examples of our natural heritage, are notified under the WCA 1981 (as amended) by reason of their flora, fauna, geology or other features. All breeding birds, their nests, eggs and young are protected under the Act, which makes it illegal to knowingly destroy or disturb the nest site during nesting season. Schedules 1, 5 and 8 afford protection to individual birds, other animals and plants.

A2.4. The CRoW Act 2000 strengthens the species enforcement provisions of the WCA 1981 (as amended) and makes it an offence to 'recklessly' disturb a protected animal whilst it is using a place of rest or shelter or breeding/nest site.

National Planning Policy

A2.5. **National policy - Planning Policy Wales (PPW) Edition 12 (February 2024)**

A2.6. Section 6.4 of PPW considers biodiversity and ecological network and states that “the planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement.”

A2.7. Addressing the consequences of climate change should be a central part of any measures to conserve biodiversity and the resilience of ecosystems. Information contained in SoNaRR, Area Statements and species records from Local

Environmental Record Centres should be taken into account. Development plan strategies, policies and development proposals must consider the need to:

- Support the conservation of biodiversity, in particular the conservation of wildlife and habitats;
- Ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;
- Ensure statutorily and non-statutorily designated sites are properly protected and managed;
- Safeguard protected and priority species and existing biodiversity assets from impacts which directly affect the nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and
- Secure enhancement of and improvement to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks.

A2.8. The Biodiversity and Resilience of Ecosystems Duty (Section 6 Duty) states that "planning authorities must seek to maintain and enhance biodiversity in the exercise of their functions. This means development should not cause any significant loss of habitats or populations of species, locally or nationally and must provide a net benefit for biodiversity. In doing so planning authorities must also take account of and promote the resilience of ecosystems, in particular the following aspects:

- Diversity between and within ecosystems;
- The connections between and within ecosystems;
- The scale of ecosystems;
- The condition of ecosystems including their structure and function; and
- The adaptability to ecosystems.

A2.9. In fulfilling this duty, planning authorities must have regard to:

- The list of habitats and species of principal importance for Wales, published under Section 7 of the Environment (Wales) Act 2016;
- The State of Natural Resources Report (SoNaRR), published by Natural Resources Wales (NRW); and
- Any Area Statement that covers all or part of the area in which the authority exercises its functions.

A2.10. The broad framework for implementing the Section 6 Duty and building resilience through the planning system includes addressing: Diversity, Extent, Condition, Connectivity and Adaptability to change (DECCA).

A2.11. The update to the PPW also included changes to the following policies that effect ecology:

A2.12. Green Infrastructure: stronger emphasis on taking a proactive approach to green infrastructure covering cross-boundary considerations, identifying key outputs of green infrastructure assessments, the submission of proportionate green infrastructure statements with planning applications and signposting Building with Nature standards.

A2.13. Net Benefit for Biodiversity and the stepwise approach: further clarity is provided on securing net benefit for biodiversity through the application of the stepwise approach, including the acknowledgement of off-site compensation measures as a last resort, and the need to consider enhancement and long-term management at each step. The use of the green infrastructure statement as a means of demonstrating the stepwise approach is made explicit. The importance of strategic collaboration to identify and capture larger scale opportunities for securing a net benefit for biodiversity is recognised.

A2.14. Protection for Sites of Species Scientific Interest (SSSI): strengthened approach to the protection of SSSIs, with increased clarity on the position for site management and exemptions for minor development necessary to maintain a 'living landscape'. Other development is considered unacceptable as a matter of principle. Exceptionally, a planned approach may be appropriate where necessary safeguards can be secured through a development plan.

A2.15. Trees and Woodlands: closer alignment with the stepwise approach, along with promoting new planting as part of development based on securing the right tree in the right place.

Local Planning Policy

A2.16. Wrexham Local Development Plan 2013 – 2028

A2.17. The environmental Policies include:

Policy SP14: Natural Environment

Development will only be permitted where it seeks to protect, conserve and enhance the natural environment including:

- Special Areas of Conservation, Special Protection Areas, and Ramsar Sites;
- Sites of Special Scientific Interest and National Nature Reserves;
- Protected Species and their habitat;
- The Clwydian Range and Dee Valley Area of Outstanding Natural Beauty
- Local Wildlife Sites;
- Local Nature Reserves;
- Special Landscape Areas;
- Natural landscape features and Green Infrastructure such as trees, hedges and woodland which contribute to the quality and diversity of the natural environment and play an important role in mitigating the impact of climate change;
- The quality of natural services including water, soundscape, air and soils; and
- Habitats and species of principal importance to Wales.

Policy NE1 International and National Nature Conservation Designations

Development likely to significantly affect any protected site of international importance, either alone or in combination with other plans or projects, will be subject to a Habitat Regulations Assessment (HRA). Development will only be permitted where it is possible to ascertain no adverse effect on the integrity of the habitat or site or where there are

Imperative Reasons of Overriding Public Interest and compensatory measures are secured.

Permission for development likely to impact the special features of a Nationally Designated Site will only be granted in exceptional circumstances where appropriate compensation can be provided.

Development likely to affect any protected species will only be permitted when there is no satisfactory alternative and if there is no detrimental impact to the maintenance of the population concerned at a favourable conservation status in its natural range. The proposals must adequately demonstrate that they are for the purposes of preserving public health or safety or reasons of overriding public interest.

Policy NE2: Local Designations for Nature Conservation and Geological Importance

Development which adversely affects the nature conservation and/or geological importance of locally designated sites, habitats and species will only be permitted in exceptional circumstances where it can be demonstrated that:

i. There is no satisfactory alternative location for the development which avoids nature conservation impacts; and

ii. Compensation measures are designed to ensure that there is no reduction in the overall nature or geological conservation value of the site.

Policy NE3 Trees, Woodlands and Hedgerows

Development will only be permitted where it does not cause unacceptable harm to trees, woodlands and hedgerows of significant public amenity, natural or cultural heritage value or those that provide important ecosystem services.

Development affecting all existing and new proposed woodlands should:

i. Support proposals which assist in the respectful and appropriate use and protection of woodlands and boundary edges;
ii. Promote sustainable management to deliver multiple benefits; and
iii. Support the relevant aims and objectives of the Wrexham Tree & Woodland Strategy 2016-2026 and all subsequent amendments.

Where adverse effects cannot justifiably be avoided and sustainable integration is not possible then adequate mitigation will be required. In such cases development should include proposals for the planting of new trees, woodlands, and hedgerows within the site, ensuring connectivity between proposed and existing green infrastructure.

Biodiversity Action Plans (BAP) - Species and Habitats of Principal Importance and the UK Biodiversity Action Plan

A2.18. The UK Post-2010 Biodiversity Framework succeeded the UK BAP partnership in 2011 and covers the period 2011 to 2020. However, the lists of Priority Species and Habitats agreed under the UKBAP still form the basis of much biodiversity work in the UK. The current strategy for Wales was published by Natural Resources Wales in their 'State of Natural Resources Report (SoNaRR) ', dated October 2016. Although the UK BAP has been succeeded, SAPs developed for the UK BAP remain valuable resources for background information on priority species under the UK Post-2010 Biodiversity Framework.

A2.19. The commitment to preserving, restoring or enhancing biodiversity is further emphasised being listed in section 7 of the Environment (Wales) Act 2016.

Appendix 3: Methodology and Results

Data Search

A3.1. A desk-based study was conducted whereby records of designated sites and records of protected and priority species were purchased and interrogated for the site and the surrounding landscape. The aim of the data search is to collate existing ecological records for the site and adjacent areas. Obtaining existing records is an important part of the assessment process as it provides information on issues that may not be apparent during a single survey, which by its nature provides only a 'snapshot' of the ecology of a given site.

A3.2. The following resources were consulted/contacted:

- Multi-Agency Geographic Information for the countryside (MAGIC) website[5];
- Local Records Centre (COFNOD)[6]; (Data ordered on 15/12/2022 and received on 25/12/2022);
- Wrexham County Borough Council website[7];
- Joint Nature Conservation Committee (JNCC) website[8];
- Natural England (NE) designated sites website[9];
- Ordnance Survey mapping; and
- Google Maps, including aerial photography.

A3.3. The following areas of search around the boundary of the site boundary were applied:

- 2 km for bat records;
- 2 km for protected and priority species, national statutory designated and non-statutory sites; and
- 10 km for European statutory sites.

'Extended' Phase I Habitat Survey and UKHabs

A3.4. An 'Extended' Phase 1 Survey was conducted on the 16th October 2020 by Laura Dennis, an experienced field ecologist. This was then updated by Dale Mortiboys (ACIEEM, FISC lvl 3) and Elliot Grundy on 22nd August 2023, experienced and suitably qualified ecologists. The methods used during the walkover survey broadly followed methods used in an

[5] https://magic.defra.gov.uk/ [Accessed 10/09/2023]
[6] https://www.cofnod.org.uk/ [Accessed: 01/09/2023]
[7] https://www.wrexham.gov.uk/ https://www.redbridge.gov.uk/planning-and-building/planning-policy/[Accessed 10/09/2023]
[8] http://jncc.defra.gov.uk/ProtectedSites/ [Accessed 10/09/2023]
[9] https://designatedsites.naturalengland.org.uk/ [Accessed 10/09/2023]

'extended' Phase I habitat survey[10] and entailed recording the main plant species and classifying and mapping habitat types with reference to the Habitat Definitions provided by the UK Habitat Classification Working Group[11].

A3.5. Additionally, the habitats identified were evaluated for their potential to support legally protected and notable fauna species. Where access allowed, adjacent habitats were also considered in order to assess the site within the wider landscape and to provide information with which to assess possible impacts within the context of the site boundary.

Evaluation

A3.6. The evaluation of habitats and species is defined in accordance with published guidance[12]. The scale of importance of each ecological feature is assigned within a defined geographical context, namely international and European, national, regional, county, and local. Below these are features considered to be of negligible importance.

A3.7. Consideration will also be given to legally protected or controlled species which are 'important features' in the context of this assessment, for which mitigation measures are required to ensure legal compliance, regardless of their geographic scale of importance. Thus, it is possible for a feature of negligible ecological importance to be legally protected and hence require mitigation.

A3.8. Evaluation is based on various characteristics that can be used to identify ecological features likely to be important in terms of biodiversity. These include site designations (such as Sites of Species Scientific Interest (SSSIs), or for undesignated features, the size, conservation status (locally, nationally or internationally), and the quality of the ecological feature. In terms of the latter, quality can refer to habitats (for instance if they are particularly diverse, or a good example of a specific habitat type), other features (such as wildlife corridors or mosaics of habitats) or species populations or assemblages.

Impact Assessment

A3.9. The assessment of impacts identifies impacts and their effects as a result of the proposed development on important ecological features. This includes consideration of impacts at all relevant stages of the development, including construction and operation/occupation. The assessment includes reference to legislation and policy, and supplementary planning guidance where relevant.

Bats

Preliminary Roost Assessment (PRA)

Previous Surveys

A3.10. An Arial Inspection for bats were completed on eight trees including T1, T2, T3, T4, T6, T8, T20 and T28, located within Phase 1 of the development on 10th August 2022 by John Moorcroft MSc MCIEEM CEnv, an experienced tree climber holding a MP2C CS 38 Tree Climbing and Aerial Rescue qualification and a S091008/1 bat licence. The survey aimed to determine the presence or likely absence of bats within the identified trees, with the tree references taken from the

[10] Joint Nature Conservation Committee (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit. JNCC, Peterborough.
[11] Butcher, B., Carey, P., Edmons, R., Norton, L. and Treweek, J. (2020). UK Habitat Classification – Habitat Definitions V1.1
[12] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester.

Arboricultural Impact assessment (AIA) produced by Tyler Grange (Report Ref: **13539_R01c** AIA). **13539/R04** details the full surveys methods and results of Aerial Inspection.

A3.11. Trees outside of Phase 1 or shown to be outside the development area of Phase 1 were not surveyed as the future phases may take some years to come forward and bat trees assessments have a limited timespan of validity.

A3.12. The results of the Aerial Inspection of the eight trees is Phase 1 were:

- Two were considered to have negligible bat roost potential (T2, T20)
- One was considered to have low bat roosting potential (T28)
- Three were considered to have moderate bat roost potential (T6, T8, T1)
- Two were considered to have high bat roost potential (T4, T3).

A3.13. The results of the Aerial Inspection, along with the recommendations is included in **Table A3.1**

Table A3.1 Results of Aerial Inspection

Tree No. (As per Tree Survey Plan)	Proposed Impact	Notes	Bat potential following climbing inspection	Recommendation
1	Not to be directly or indirectly impacted. Avoiding impacts by the lighting schedule.	**Climbed, Mature Oak** all suitable PRF examined with torch and endoscope. 8 PRFs identified spread across all aspects. Includes callus rolls, limb breaks and small cavities within limbs	Moderate	No proposed direct or indirect impacts. No further works required.
2	Not to be directly or indirectly impacted. Avoiding impacts by the lighting schedule.	**Climbed, Immature Sycamore** Young sycamore tree with stem diameter of approximately, 15cm. Height is approximately 8m bifurcates at 2m. No potential roost features have developed.	Negligible	No proposed direct or indirect impacts. No further works required.
3	Not to be directly or indirectly impacted. Avoiding impacts by the lighting schedule.	**Climbed, Sycamore** all suitable PRF examined with torch and endoscope. 4 PRFs identified spread across all aspects. Includes 3 knot holes offering low potential for individual bats and a large trunk cavity with a ramshorn feature which offers high potential offering wider bat roosting opportunities	High	No proposed direct or indirect impacts. No further works required.
4	Not to be directly or indirectly impacted. Avoiding impacts by the lighting schedule.	**Climbed, Mature Oak** all suitable PRF examined with torch and endoscope. 6 PRFs identified spread across all aspects. Includes tear outs from the main trunk leading to cavities as well as broken limb features.	High	No proposed direct or indirect impacts. No further works required.
6	Not to be directly or indirectly impacted.	**Climbed, Mature Oak** all suitable PRF examined with torch and endoscope. 6 PRFs identified spread across all aspects. Includes	Moderate	No proposed direct or indirect impacts. No further works required.

Tree No. (As per Tree Survey Plan)	Proposed Impact	Notes	Bat potential following climbing inspection	Recommendation
	Avoiding impacts by the lighting schedule.	tear outs from the main trunk leading to cavities as well as broken limb features		
8	Not to be directly or indirectly impacted. Avoiding impacts by the lighting schedule.	**Climbed, Mature Oak** all suitable PRF examined with torch and endoscope. 6 PRFs identified spread across all aspects. Includes tear outs from the main trunk leading to cavities as well as broken limb features.	Moderate	No proposed direct or indirect impacts. No further works required.
20	To be removed	**Climbed, Ash** all suitable PRF examined with torch and endoscope. 6 PRFs identified spread across all aspects. Includes tear outs from the main trunk leading to cavities as well as broken limb features	Negligible	No Further survey required
28	To be removed	**Not Climbed, Dead Standing Oak** Tree unsuitable to climb as no safe anchor points. The tree is dead and all bark has fallen off leaving hard wood dead standing tree.	Low	Section felling with pre-inspection check from MEWP due to inability to climb this tree

2023 PRA

A3.14. A PRA update assessment of the trees within Phase 1 of the development was undertaken on 22nd August 2023 by Dale Mortiboys (accredited agent under a S091008/1 bat licence) with assistance from Elliot Grundy. All trees within and adjacent to Phase 1 of the development were assessed to identify and potential roosting features (PRF) for bats, including hibernation roosts, as identified within published guidance[13][14]. These PRFs include:

- Woodpecker/ rot holes;
- Hazard beams;
- Other vertical or horizontal cracks and splits (such as frost-cracks) in stems or branches;
- Partially detached platey bark;
- Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar;
- Man-made holes (e.g. cavities that have developed from flush cuts) or cavities created by branches tearing out from the parent stems;
- Cankers (caused by localised bark death) in which cavities have developed;

[13] Collins, J. (2016) *Bat Surveys for Professional Ecologists: Good Practice Guidelines*. 3rd edition. Bat Conservation Trust, London.
[14] Bat Tree Habitat Key (2018) Bat Roosts in Trees: a guide for identification and assessment for tree-care and ecology professionals. Pelagic Publishing, Exeter.

- Other hollows or cavities, including butt-rots;
- Double-leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bird, bat or dormouse boxes.

A3.15. Signs of a bat roost, as identified by the BCT, besides the actual presence of bats themselves, were also searched for. These signs include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

A3.16. The potential of the trees to support roosting bats was assessed using the criteria shown in **Table A3.2** below.

Table A3.2 – Roost Assessment Criteria.

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for long periods of time due to their size, shelter, protection conditions and surrounding habitat.

Limitations

A3.17. Bats use a variety of roosts, ranging from maternity, mating or swarming and hibernation roosts, containing many individuals, to mating or night-time feeding roosts containing few individuals or single animals. Bats also tend to be nomadic (although are faithful to certain favoured roosting sites), spending variable lengths of time in a variety of roosts. Thus, even with considerable survey effort it is possible that small transient roosts of bats may have been missed, although these tend to be less important to bats and so this should not affect the evaluation and recommendations made.

Results

A3.18. All trees surveyed within Phase 1 of the development were found to be as assessed in the 2022 Aerial Inspections.

Bat Activity - Transect Surveys and Static Deployment

Previous Surveys

A3.19. Bat Surveys of the Site were undertaken by Tyler Grange in 2021, including Bat Activity Transect Surveys and Static Deployments. **13539/R02b** details the full methods and results of these surveys.

A3.20. Activity Surveys were completed once per month from May to October 2021, with two static detectors delayed in each of these months for 5 consecutive nights.

A3.21. A total of 287 bat passes were recorded during the transect survey visits. These passes were from four distinct species and two species groups which were:

- common pipistrelle (184 passes);
- soprano pipistrelle (78 passes);
- noctule (12 passes);
- Myotis species group (9 passes);
- Pipistrelle species group (2 passes).

A3.22. A total of 4973 bat passes were recorded during the static detector surveys. These passes were from:

- common pipistrelle (3035 passes);
- soprano pipistrelle (1367 passes);
- Myotis species bats (138 passes);
- noctule (269 passes);
- lesser horseshoe bat (2 passes);
- brown long-eared (34 passes);
- Myotis Sp./brown long-eared bat (26 passes); and
- Unidentified Pipistrelle bat species (102 passes).

A3.23. Following the 2021 surveys, the Site was considered to be of moderate level for local bat commuting and foraging.

2023 Surveys

A3.24. Two update Bat Transect Surveys were completed between August and September 2023 at the Site to update the previous surveys completed across the Site in 2021 (**13539/R02b**). The update surveys concentrated on habitats of local ecological importance, such as the broadleaved woodland, hedgerows and scattered trees, and aimed to record

the bat species present to determine the importance of any habitat features to foraging and / or commuting bats in line with survey guidance. Plan **13539/P06a** appended to this report shows the transect route.

A3.25. The survey details are provided in **Table A3.3** below. Surveyors used a combination of direct visual observation and echolocation detection techniques to identify any bat activity on the Site. In line with survey guidelines, the surveys started approximately at sunset and ended up to two hours after sunset.

Table A3.3 – Transect Survey Details

Survey	Date	Survey times	Weather conditions (start-end)	Surveyors and equipment
1	17/08/2023	Start: 20:35 Sunset: 20:35 End: 22:35	Wind (Beaufort): 1-1 Temp (°C): 18-16 Precipitation: None Cloud (%): 50-50	Laura Jones Richard Laws *Batlogger M2*
2	13/09/2023	Start: 19:33 Sunset: 19:33 End: 21:33	Wind (Beaufort): 1-1 Temp (°C): 17-17 Precipitation: None Cloud (%): 60-70	William Robson Bek Stobbart *Batlogger M2*

A3.26. Elekon BatLogger M2 detectors were used throughout surveys; the BatLogger detector was used for active monitoring and full spectrum recording whilst the Anabat Express detectors for recording in zero crossing format. AnalookW, Anabat Insight and BatExplorer software was used to confirm the identification of bat calls recorded in the field.

A3.27. Further update activity data was obtained from the deployment of static bat detectors in August and September 2023. The detector locations are shown on plan **13539/P06a** appended to this report.

A3.28. During each deployment, detectors were set to record for a minimum of five consecutive nights and were programmed to begin recording 30 minutes before sunset and continue to record until 30 minutes after sunrise. The details of the static deployments are shown in **Table A3.4** below.

Table A3.4 Static Deployment Details

Visit	Month	Dates Deployed	Overnight Weather Conditions (min max temp °C, min & max wind mph, precipitation*)
1	August	17/08/2023 – 21/08/2023	Temp (°C): 13 – 22 Wind (mph): 12 – 21 No precipitation
2	September	13/09/2023 – 17/09/2023	Temp (°C): 9 – 20 Wind (mph): 8 – 15 No precipitation

Limitations

A3.29. Only two update Bat Activity and Static Detector Surveys were completed in 2023, which does not follow best practice guidance. However, the aim of these surveys were to act as updates from the full monthly surveys completed in May-October 2021. As there had not been any change in on-site habitats between 2021 and 2023, and the results of the update surveys were similar to those completed in 2021, undertaking further update surveys was deemed unnecessary as the results would only have compounded the current assessment of Site's importance for local bats.

A3.30. Bat surveys are subject to numerous variables. The echolocation of species such as brown long-eared bats are of low amplitude and may not always be picked up on bat detectors. Survey results represent a sample of bat activity during the surveys; it is possible that bats may use the Site at other times.

A3.31. Bat calls cannot always be identified to species level, either due to distant contacts or the similarity between some types of bats. Where this occurs, it is recorded as 'unidentified bat species' (Unid) or will show which bat species it is likely to be (e.g Pipistrelle sp./Mytosis sp.).

Results-Transects Surveys

A3.32. A total of 156 bat passes were recorded during the transect survey visits. These passes were from three different species including common pipistrelle *Pipistrellus pipistrelllus* (90 passes), soprano pipistrelle *Pipistrellus pygmaeus* (65 passes), and brown long-eared bat *Plecotus auritus* (1 pass).

A3.33. The number of passes recorded for each species on each visit are detailed and illustrated in **Table A3.5** and **Figure A3.1** below.

Table A3.5 – Summary of bat passes and species recorded during bat activity surveys.

Bat Species	Number of Recordings		
	V1 – 17/08/2023	V2 – 13/09/2023	Total
Common Pipistrelle	27	63	90
Soprano Pipistrelle	44	21	65
Brown Long-eared	1	0	1

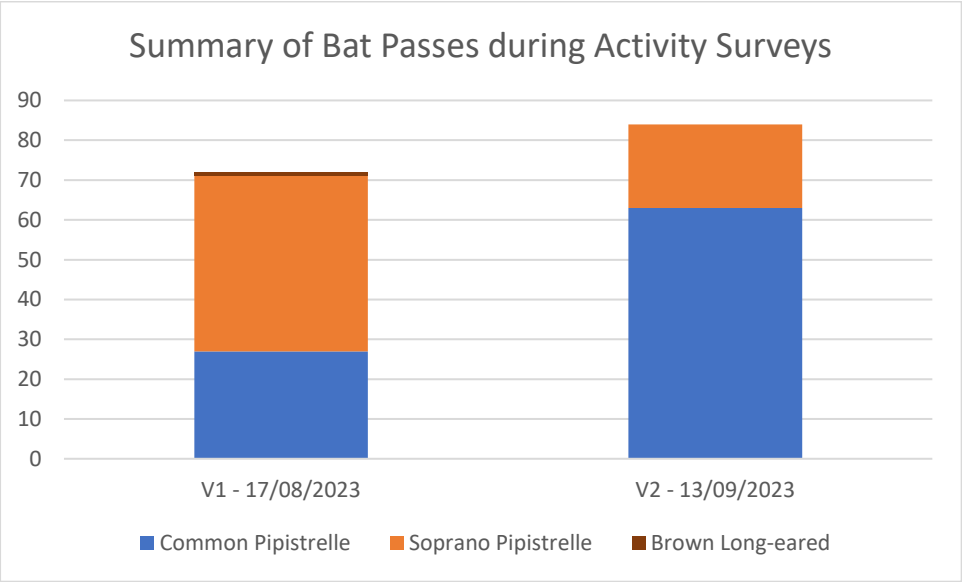


Figure A3.1 – Illustration of bat passes and species recorded during bat activity surveys.

A3.34. Common pipistrelle and soprano pipistrelle activity was distributed across the areas of the site surveyed – see plan **13539/P06a** appended to the report. Pipistrelle activity appeared highest within the area of amenity and woodland situated in the western region of the Site. Brown long-eared bat activity was generally low throughout the surveys, and no signs of fidelity were seen to certain areas of the Site.

Results-Static Deployments

A3.35. A total of 1184 bat passes were recorded during the static detector deployment periods. These passes were from six different species including common pipistrelle (591 passes), soprano pipistrelle (388 passes), noctule bat *Nyctalus noctula* (20 passes), myotis species *Myotis* (110 passes), brown long-eared bat (71 passes), and lesser horseshoe *Rhinolophus hipposideros* (3 passes).

A3.36. The number of passes recorded for each species during each deployment are detailed and illustrated in **Table A3.6** and **Figure A3.2** below. Locations of each static detector deployment can be seen on plan **13539/P06a** appended to this report.

Table A3.6 – Summary of bat passes and species recorded during static detector deployments.

Bat Species	**Number of Recordings**			
	V1A	**V2A**	**V2B**	**Total**
Common Pipistrelle	425	78	88	**591**
Soprano Pipistrelle	117	116	155	**388**
Noctule	7	0	13	**20**
Myotis Sp.	40	22	48	**110**
Brown long-eared	36	3	32	**71**
Lesser Horseshoe	4	0	0	**4**

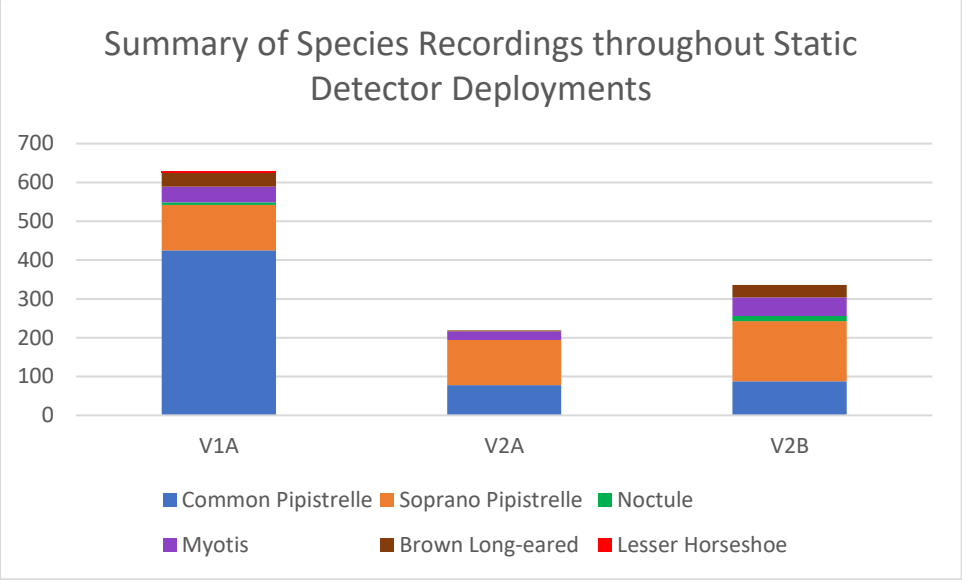


Figure A3.2 – Illustration of bat passes and species recorded during static detector deployments.

A3.37. Most bat activity was recorded from location V1A, situated within the western area of the site during the month of August, with the highest number of passes of any deployment (629 passes). Elsewhere across the site levels of bat activity remained consistent.

A3.38. Common pipistrelle and soprano pipistrelle bats were recorded most frequently and at all static detector locations. Although brown long-eared and myotis bats were recorded less frequently, these were also recorded across all locations and were distributed evenly across the Site.

A3.39. Lesser horseshoe and noctule bats were not recorded on every visit. Noctules were however recorded during the majority of visits, albeit in lower numbers, and were distributed evenly across the Site. Lesser horseshoe bats were recorded only during visit 1 from location V1A, located in the woodland block surrounding the on-site pond in the west of the Site.

Breeding Bird Surveys

A3.40. A total of four Breeding Bird Surveys were completed within the Site, staring in May 2021 and finishing in June 2021; with two surveys per month undertaken by suitably qualified ecologists experienced in undertaking bird surveys. The method used was based on a territory mapping methodology in accordance with published guidance (Bibby et al 2000, Gilbert et al 1998). The survey details are presented in **Table A3.7** below.

Table A3.7 Breeding Bird Survey Details

Visit	Date	Time	Weather	Surveyors
1	12/05/2021	06:15 – 08:00	Wind: Beaufort Scale (BFS) 0, cloud: 10%, precipitation: none, temperature 5-7°C	Joseph Dance Nick Bell
2	28/05/2021	06:00 – 08:45	Wind: BFS 1, cloud: 50%, precipitation: none, temperature 2°C	Richard Castell

3	15/06/2021	05.45 – 08:00	Wind: BFS 0, cloud: 10%, precipitation: none; temperature: 10°C	Joseph Dance
4	21/06/2021	06:00 – 08:30	Wind: BFS 2, cloud 75%, precipitation: none; temperature: 11-14°C	Richard Castell

A3.41. The survey visits were conducted during the period between one hour after sunrise and approximately 09:00, as this is considered to be the best time to record bird breeding activity. The identity and activity of all birds, either seen or heard, were recorded on maps of a suitable scale.

A3.42. Although the same survey route was used during all visits, the starting point and survey direction were alternated during each survey so that all areas were covered at varied times after sunrise to ensure even coverage during the peak period of bird activity.

A3.43. On each survey, bird activity likely to indicate breeding was recorded on a map. Species were noted using the standard British Trust for Ornithology (BTO) codes. Behaviour considered likely to indicate breeding included: singing, display flights, mating and courtship displays, nesting, carrying of nesting material and birds showing fidelity to a particular patch of ground or vegetation. An aggregation of two or more sightings of a species was taken to be an indication that breeding was likely. Also, if specific behaviours (such as the gathering of nest material, copulations, adults carrying food or recently fledged young) were observed, this was also taken to indicate breeding.

A3.44. Confirmed' breeding status was attributed to those species where active nests and/or chicks were recorded; 'Probable' breeding status was attributed to those species that were regularly recorded within the Site in proximity to suitable nesting habitat but with insufficient data to confirm breeding. 'Possible' breeding status was attributed to those species that were recorded within the Site and with a general lack of suitable nesting habitat present within the Site.

A3.45. Over-flying birds such as corvids, woodpigeons and black-headed gulls were not recorded.

A3.46. The results of each visit were then transcribed onto a summary map in order to identify species showing fidelity to areas of habitat over several Site visits.

A3.47. The conservation status of the birds observed was ascertained through consultation of national, regional and local bird reports.

Limitations

A3.48. An April survey visit was not possible so an extra survey visit between May and June was undertaken (typically only three survey visits are required between April and June for territory mapping purposes). Given the generally low ornithological interest recorded within the Site, and using worst-case assumptions regarding species which may have been missed, this is not expected to have altered the conclusions made in this report.

Results

A3.49. **Table A3.8** below summarises the results of the bird surveys completed within the Site in relation to species encountered, breeding status, likely number of territories and distribution within the Site. The results are also presented on Plan **13539/P03** appended to this report.

Table A3.8 Breeding Bird Survey Results

Species	Conservation Status[15]	Site Breeding Status	No. Territories	Summary
Lapwing *Vanellus vanellus*	Red List	Probable breeder	Up to three	This species was confined to the south-eastern arable fields within the Site, with a maximum count of six birds on a single survey visit (first may visit). No active nests were observed, but behaviour indicative of nesting (adults attacking corvids and fake feeding/injury feigning) was noted. The number of birds recorded decreased throughout the surveys, with no birds recorded on the final survey visit. The peak of activity (i.e. mid-May) is consistent with early season (i.e. April) breeding attempts before the adults and their young disperse once mature enough.
Song Thrush *Turdus philomelos*	Amber List	Probable breeder	Up to three	At least two territories of this species, confirmed by singing males or repeated observations, were noted in the central tree and hedgerow line which follows the public footpath in the north of the Site. A further territory was suspected in the woodland in the centre of the playing fields (confirmed by a singing male at the same time as another bird alarm calling), but this was only recorded on the last survey visit. No conclusive evidence of breeding was noted.
House Sparrow *Passer domesticus*	Red List	Non-breeder	None	Although the Site itself offers no potential breeding habitat for this species, this species was regularly recorded foraging and 'loafing' in boundary hedgerows within the Site adjacent to residential estates. The most regular occurrences were noted in the far south-western hedgerow adjacent to Cefn Road, the hedgerow between the Site and the farmstead to the south, and the far north-western hedgerow. Limited activity was noted in the central tree and hedgerow line which follows the public footpath within the Site.
Starling *Sturnus vulgaris*	Red List	Non-breeder	None	Although no evidence of breeding activity was recorded within the Site , it was evident that adult birds used the Site for foraging and collecting food to return to young off-site in the residential estate. On the final survey visit, up to 50 birds (a combination of adults and juveniles) were recorded foraging in the playing fields in the west of the Site. Prior to this, all fields in the west of the Site (principally the playing fields) were noted to support foraging adults who were then observed flying off-site (with food in some instances) to the adjacent residential estates.
Hirundines: Swallow *Hirundo rustica*, Swift *Apus apus* and House Martin *Delichon urbicum*	House martin and swift-Red List	Non-breeders	None	No nesting habitat for these species was recorded within the Site. All of these species were regularly recorded foraging within the Site, however, and it is likely they nest in the adjacent farm complex and residential estate and use the Site for foraging only.

[15] Birds of Conservation Concern 5 -RSPB/BTO – December 2021

Species	Conservation Status[15]	Site Breeding Status	No. Territories	Summary
Dunnock *Prunella modularis*	Amber List	Probable breeder	Unknown (Up to 10)	Many birds were recorded singing within the Site in association with internal and boundary hedgerows, with a maximum count of 10 individual singing males recorded on the final June visit. This could indicate the presence of 10 breeding territories within the Site but due to the breeding ecology and behaviour of this species, it cannot be confirmed. At least five territories are considered to be present based on the aggregation of sightings and singing males in similar locations across visits. These were restricted to the central area of the Site in the hedgerow and scrub belt which separates the playing fields from arable land to the south, and between the Site and the farmstead to the south. No conclusive evidence of breeding was recorded within the Site.
Whitethroat *Sylvia communis*	Amber List	Probable breeder	Three	A maximum number of seven males were recorded singing on the first visit in May but this subsequently decreased to aggregations of singing males and sightings in three locations, indicating three territories. It is suspected that the birds singing in May were still establishing territories and subsequently dispersed. The areas where the territories were recorded were along the central tree/hedge line and within scrub between the Site and the farmstead to the south.
Little owl *Athene noctua*	Green List	Confirmed breeder	One	A little owl nest was recorded within a mature oak tree in the centre of the playing fields in the west of the Site.
Reed bunting *Emberiza schoeniclus*	Amber List	Non-breeder	None	A single bird was noted to fly through the Site and the Site generally offers no suitable breeding habitat for this species.
Herring gull *Larus argentatus*	Red List	Non-breeder	None	Although the Site offers no suitable habitat for breeding attempts for this species, a number of birds were regularly recorded foraging and resting in the arable and playing fields within the Site, at a maximum count of 34 birds on the first May visit.
Lesser black-backed gull *Larus fuscus*	Amber List	Non-breeder	None	Although the Site offers no suitable habitat for breeding attempts for this species, a number of birds were regularly recorded foraging and resting in the arable and playing fields within the Site, at a maximum count of 15 birds on the second May visit.
Greenfinch *Cardeulis chloris*	Red List	Possible breeder	None	A single bird was heard calling within the Site on one occasion but the Site and adjacent residential estates do provide some suitable habitat for nesting attempts.
General	Green/Amber List	See individual species list	N/A	A number of other common/widespread urban/suburban green list species were recorded within the Site and treated as probable breeders given the presence of suitable habitat or observing confirmed breeding behaviour (i.e. adults with young), or either noted as foragers/passing through. These species were: • Magpie *Pica pica* (possible) • Chiff chaff *Phylloscopus collybita* (probable) • Carrion crow *Corvus corone* (possible) • Wren *Troglodytes troglodytes* (probable) • Wood pigeon *Columba palmubus* (probable)

Species	Conservation Status[15]	Site Breeding Status	No. Territories	Summary
				• Blue tit *Cyanistes caeruleus* (probable) • Great tit *Parus major* (probable) • Blackbird *Turdus merula* (confirmed) • Robin *Erithacus rubecula* (probable) • Rook *Cornus frugilegus* (possible) • Blackcap *Sylvia atricapilla* (probable) • Chaffinch *Fringilla coelebs* (probable) • Goldfinch *Cardeulis cardeulis* (probable) • Moorhen *Gallinula chloropus* (possible) • Mallard *Anas platyrhynchos* (possible) • Jackdaw *Corvus monedula* (possible) • Stock dove *Columba oenas* (possible)

A3.50. It is considered that the principal ornithological value of the Site for nesting is within the boundary vegetation comprising hedgerow and scrubby margins, which were noted to support probable breeding from a number of birds of conservation concern and other 'green list' species. The central woodland copse within the Site was also noted to support a wide range of both amber and green list species. The arable fields also provide value for two or three pairs of breeding lapwing, which is the only red listed species with territories recorded on-site.

A3.51. Whilst the playing fields within the Site offer no suitable habitat for nesting, they are obviously important in maintaining bird populations locally for those species which utilise such grassland for foraging and rearing young, principally starling and thrushes.

Great Crested Newt Survey

A3.52. The general area of Wrexham which surrounds the Site has been surveyed extensively for GCN in recent years and consultation was therefore undertaken with Wrexham's ecologist, Emma Broad, in May 2021 to establish the extent of survey effort. It was agreed that a proportionate survey effort would be to undertake a single traditional presence/likely absence survey of all ponds within and adjacent to the Site, followed by an eDNA survey.

Presence/Likely absence surveys

A3.53. A single GCN presence/absence survey of the waterbodies within and adjacent to the Site was carried out by a pair of experienced ecologists in May 2021 in accordance with recommended guidelines (English Nature, 2001). The surveyors acted as an accredited agent under Natural Resource Wales Survey Licence reference S089282/1, with full surveyor details provided in the **Table A3.9** below. The location of each pond is presented in **13539/P04** appended to this report.

A3.54. Each waterbody was surveyed using three out of the following four different methods:

- Egg searching: Although the data cannot be used to estimate population size it indicates the presence of breeding adults. All suitable submerged vegetation was carefully searched for GCN eggs which are characteristically folded individually in the submerged leaves of aquatic vegetation;
- Bottle Trapping: Setting of bottle traps (where waterbody conditions allowed). This involved the use of funnel traps (made from 2 litre clear plastic bottles) that were secured in the water at 2m intervals around

the margin in the evening before dark, and left overnight to be checked and any caught animals released the following morning;

- Torch survey: The accessible margins of the waterbody were slowly walked over, searching the margins by torchlight (with torches of one million candlepower) for GCN and other amphibians; and

- Netting: Nets with a rigid metal frame and a mesh of approximately 2-3mm were used around the perimeter of the pond to net every two meters of shoreline. Netting is preferably done through aquatic vegetation in order to maximise the likelihood of catching GCN and other amphibians. This method was only used when one of the above three methods was not possible.

A3.55. All amphibians observed were counted and where possible identified to species, sex and life stage. Survey dates and weather conditions are detailed in **Table A3.9** below.

Table A3.9 – GCN Survey Details

Visit	Waterbodies Surveyed	Date	Weather conditions	Air temperature during torching	Surveyors
1	1, 2, 3, 4, 5, 6, 7	17 – 18.05.2021	Wind BFS 2-3, Cloud 40%, no rain, 6/7°C overnight minimum temperature	8°C	John Moorcroft Sophie Kirk

eDNA Survey

A3.56. Following on from the presence/absence surveys, eDNA samples of ponds were undertaken on the 10th of June 2021 by Amy Sherwin (NRW GCN Licenced Surveyor Ref S089282/1) and assisted by Tasha Hesketh, who are both appropriately experienced in undertaking such surveys.

A3.57. As per guidance by the kit supplier, a total of 20 samples of water were collected from the perimeter of each pond. Due care and attention was observed during the sampling to avoid stirring up sediment and to take samples covering the full extent of the pond including clear areas of water, deeper areas of the pond and areas close to potential egg laying substrate. Samples were returned to NatureMetrics on the same/following day for analysis.

Limitations

A3.58. Pond 3 was found to be too dry for the Presence/Absence Survey to be completed, however, was holding enough water during the eDNA Survey to allow this surveys to be completed.

A3.59. At the time of the eDNA survey, Pond 7 was too dry to survey and therefore not subject to an eDNA survey.

A3.60. Limitations for the water samples and the eDNA process include the inability to access the whole perimeter of the ponds which may result in deposits of DNA being missed and the collection of residue from the pond bed into the sample tubes which could distort results.

Results

A3.61. **Table A3.10** below presents the results of the single presence/absence survey completed on the ponds within and adjacent to the Site on the 17th/18th May 2021.

Table A3.10: Presence/Absence Survey Results

Waterbody No.	Torching			Trapping			Netting			Other species	Eggs Found (Y or N)	Notes
	GCN	SN	PN	GCN	SN	PN	GCN	SN	PN			
1	0	0	0	0	0	0	-	-	-	-	No	
2	Too dense with leaf litter and duckweed to trap or torch – eDNA undertaken											
3	Dry											
4	0	0	0	**2M**	0	0	-	-	-	-	No	
5	0	0	**1F**	**-**	-	-	-	-	-	-	No	Heavy duckweed and shallow – no traps and limited torching.
6	0	0	0	0	0	0	0	0	0	-	No	
7	0	0	0	-	-	-	-	-	-	-	No	Only torching undertaken, too shallow to set traps.
Key – GCN= Great crested newt, SN= Smooth newt, PN = Palmate newt. M = Male, F = Female, JV = Juvenile												

GCN=great crested newt
SN=smooth newt
PN=palmate newt
M=male
F=female

A3.62. Two male GCN were recorded in Pond 4 but in no other ponds.

A3.63. The results of the eDNA survey can be seen in **Table A3.11** below and are attached at **Appendix 4.**

Table A3.11: eDNA Survey Results

Pond Number	Results
1	Negative
2	Negative
3	Inconclusive (therefore assumed positive)
4	Not samples (already confirmed positive)
5	Positive
6	Positive
7	Dry

A3.64. GCN eDNA surveys found positive results for great crested newts Pond 6 on-site and Pond 5 within 250m of the Site boundary, see plan reference **13539/P04** appended to this report. Pond 4 was not sampled for eDNA as two male great crested newts were recorded during the Presence/Absence Survey. Even though Pond 3 was found to be dry during the Presence/Absence Survey, it returned an inconclusive results for eDNA, so as a precautionary approached,

Pond 3 was also assumed positive. GCN are therefore likely to be present on-site and are present in the surrounding landscape.

A3.65. Although the results of the Presence/Absence Surveys would indicate that only a small GCN metapopulation (i.e. 1-10 individuals) exists across the ponds surveyed, based on previous surveys in the area and known GCN distribution across Wrexham, it is considered that the ponds form part of a single medium-sized metapopulation.

A3.66. The terrestrial habitat within the Site of suitability to GCN is the woodland containing Pond 6 and the connecting hedgerows through the Site and associated field margin vegetation, which also provide connectivity to the wider landscape. The majority of the Site however comprises intensive agricultural land/short-mown playing fields. Whilst GCN would not be reliant on these habitats for sustaining the metapopulation present, this species will inevitably cross such habitat when dispersing through the landscape.

Appendix 4: GCN eDNA Survey Results 2021

13539 GCN eDNA Results 2021

GREAT CRESTED NEWT **DETECTION RESULTS**

Company:	Tyler Grange
Order number:	102385
Project code:	Cefn Road, Wrexham
Date of Report:	29 June 2021
Number of samples:	5

Thank you for sending your samples for analysis by NatureMetrics. Your samples have been processed in accordance with the protocol set out in Appendix 5 of Biggs et al. (2014).

Summary of the results

Results indicate GCN presence in 'Pond 5 ' and 'Pond 6 '.

No GCN were detected in 'Pond 1 ' and 'Pond 2 '.

The negative controls were blank, the extraction blank control was negative, and the positive controls and their replicates were standard.

Inhibition was detected in 'Pond 3 ', which was not resolved with DNA dilution, we therefore return this result as inconclusive.

Results are based on the samples as supplied by the client to the laboratory. Incorrect sampling methodology may affect the results. Note that a negative result does not preclude the presence of Great Crested Newts at a level below the limits of detection.

Methods

eDNA was precipitated via centrifugation at 14,000 x g and then extracted using Qiagen Blood and Tissue extraction kits. qPCR amplification was carried out in 12 replicates per sample, using GCN specific primers and probes described in Biggs et al. (2014), in the presence of positive controls, extraction controls, and template negative controls. A score is given for the number of positive replicates out of 12.

The qPCR method follows the recommendations set out by NatureMetrics for Natural England in the qPCR validation project and helps improve the reliability of the interpretation of the data. Results from the assay are considered to have a high rating of confidence according to our Validation Scale (Harper et al. 2021).

The quality control methods exceed the requirements outlined in Biggs et al. (2014) Appendix 5. These consist of the use of kit blanks, additional extraction blanks and template negative controls, and positive controls standards of known concentration in triplicate to generate limits of detection and give confidence to the low and late amplifications.

Kit ID	Pond ID	Arrived	Inhibition	Degradation	Score	Status
2718	'Pond 1 '	15-Jun	No	No	0	Negative
2719	'Pond 2 '	15-Jun	No	No	0	Negative
2722	'Pond 3 '	15-Jun	Yes	No	0	Inconclusive
2723	'Pond 5 '	15-Jun	NA	No	12	Positive
2721	'Pond 6 '	15-Jun	NA	No	10	Positive

END OF REPORT

Report issued by: **Thomas Shannon**

Contact: **team@naturemetrics.co.uk**

Understanding your results

Positive Target DNA has been detected in this sample, meaning that at least 1 of the 12 qPCR replicates has amplified. This is not a quantitative test, so you should not interpret a high number of positive replicates (e.g. 12/12) as necessarily indicating a larger population of GCN than a low eDNA score (e.g. 1/12).

Negative No target DNA has been detected in this sample, and the internal and external controls worked as expected. This tells us that if there had been GCN DNA in the sample, we would have detected it, so we can be confident in its absence from the sample provided.

Inconclusive No GCN DNA was detected in the sample, but the internal controls failed to amplify as expected. This means that any GCN DNA in the sample might also have failed to amplify properly, so we cannot have confidence in this negative result. Inconclusive results can be caused by the degradation of the DNA (when the DNA marker contained in the ethanol in the kits fails to amplify) or by inhibition of the reaction (when the marker added in the lab fails to amplify) caused by certain chemicals or organic compounds that may be present in the water sample.

Validation Scale We have developed our own confidence assessment tool for qPCR eDNA assays that builds upon the Thalinger et al. (2021) validation scale and helps end-users to interpret the qPCR outputs but also contextualise these with the level of validation that the assay itself has gone through. Briefly, the level of confidence that can be assigned to results coming from an assay is derived from several validation steps:

- Basic analysis - can the assay work in principle on the computer?
- PCR protocol - has the protocol been optimised in the lab?
- Specificity analysis - has the assay been tested in the lab against other co-inhabiting and/or closely related species?
- How extensive has the assay been tested with natural samples?
- Have the theoretical limits of detection been established?
- Have detection probabilities been estimated with extensive site occupancy modelling?
- Have external factors affecting detectability been extensively tested (e.g. seasonality, spatial heterogeneity)?

- Low Results from these assays are difficult to interpret with confidence. It is impossible to conclusively tell if the target species is present or absent because of the limited amounts of *in silico*, *in vitro*, and *in vivo* testing.

- Medium Assays with this rating have been tested *in silico*, have optimised lab protocols, specificity and sensitivity tested in and out of the lab, but with no estimates of detection probabilities or extensive testing of external factors that may affect the detectability of the target. Positive results can be interpreted as meaning the target species DNA is present (assuming the correct sampling conditions), but negative results could mean that the target is absent or that external factors such as ecology, seasonality, spatial scales are influencing the detections.

- High High rating assays have everything that a Medium assay has, in addition to site occupancy modelling and extensive testing of external influencers such as ecological, temporal and spatial factors. Positive results can be conclusively interpreted, and negative results can be interpreted as meaning the target species DNA is absent (assuming the correct sampling conditions). In some instances, a probability of target species presence at a site and in a sample can be given.

Glossary

controls Controls are used to monitor both the performance of the assays but also any contamination. These samples are treated in the same way as a normal sample. This is particularly important given the sensitivity of these eDNA qPCR methods. Our full complement of controls enables us to fully monitor the whole GCN eDNA process from kits to data.

- kit blank Used to determine if the kits are contaminated but also to monitor the early stages of the pipelines - e.g. sample reception. These samples also act as uninhibited samples that can be used as a baseline to compare against. This is an additional control not specifically mentioned in the Biggs et al. 2014 protocol.

- EB Extraction blank. Used to monitor potential contamination during the DNA extraction process.

- TNC Template negative control. Used to monitor potential contamination during the qPCR setup process. For every qPCR reaction, we run we include more template negative controls than are prescribed in the Biggs et al. 2014 protocol.

- positive Used to determine whether the assay is working correctly. In addition to the 4 standard dilutions prescribed by the Biggs et al. 2014 protocol, we include an additional standard dilution and amplify all standards in triplicate. We can use this increased number of replicates and standards to generate standard curves that will allow us to calculate the limit of detection (LOD).

- LOD Limit of detection. The lowest concentration of positive control DNA that amplifies. LOD is determined for every single reaction performed. Target amplification below the LOD cannot automatically be considered as negative but should be further investigated as spurious amplifications are more prevalent at these low concentrations.

eDNA Short for 'environmental DNA'. Refers to DNA deposited in the environment through excretion, shedding, mucous secretions, saliva etc. This can be collected in environmental samples (e.g. water, sediment) and used to identify the organisms that it originated from. eDNA in water is broken down by environmental processes over a period of days to weeks. It can travel some distance from the point at which it was released from the organism, particularly

in running water. eDNA is sampled in low concentrations and can be degraded (i.e. broken into short fragments), which limits the analysis options.

inhibitors Naturally-occurring chemicals/compounds that cause DNA amplification to fail, potentially resulting in false-negative results. Common inhibitors include tannins, humic acids and other organic compounds. Inhibitors can be overcome by either diluting the DNA (and the inhibitors), but dilution carries the risk of reducing the DNA concentration below the limits of detection.

qPCR Stands for 'quantitative PCR', a PCR reaction incorporating a coloured dye that fluoresces during amplification, allowing a machine to track the progress of the reaction. Often used with species-specific primers where detection of amplification is used to infer the presence of the target species' DNA in the sample. If the species is not present in the sample, no fluorescence will be detected.

- primers Short sections of synthesised DNA that bind to either end of the DNA segment to be amplified by PCR.

- probe A short section of synthesised DNA that binds to a specific section of the target species' DNA within the section flanked by the primers. The probe is designed to be totally specific to that species. The probe is labelled such that it fluoresces during amplification, which is used to infer the presence of the target species' DNA in the sample.

References

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.

Harper KJ, Tang CQ, Bruce K, Ross-Gillespie A, Ross-Gillespie V, and Egeter B 2021. A framework for assessing confidence in environmental DNA qPCR assays and results. Natural England Report.

Thalinger B, Deiner K, Harper LR, Rees HC, Blackman RC, Sint D, Traugott M, Goldberg CS, and Bruce K (2021). A validation scale to determine the readiness of environmental DNA assays for routine species monitoring. bioRxiv 2020.04.27.063990; doi: https://doi.org/10.1101/2020.04.27.063990

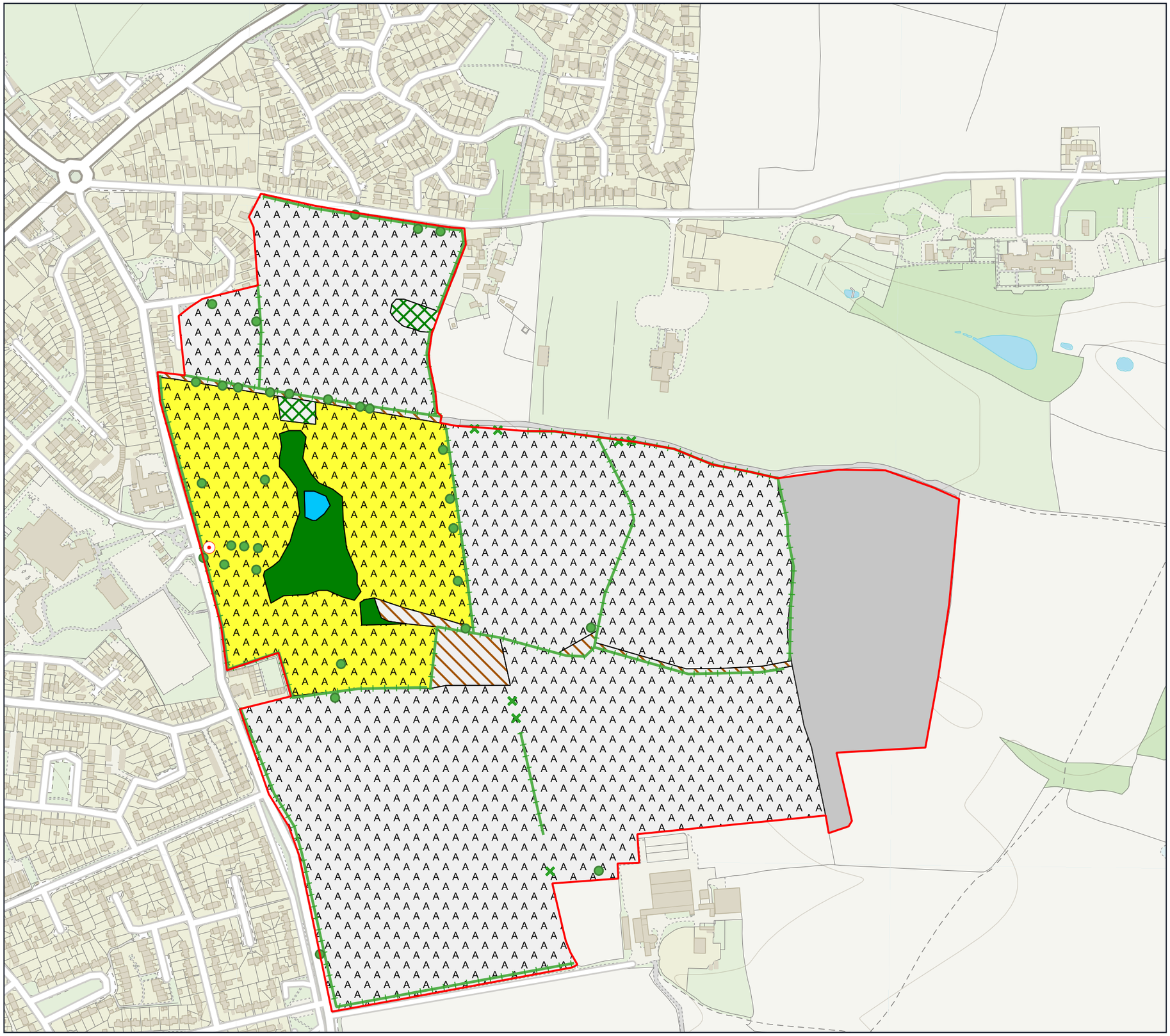
Plans:

Plan 1: Habitat Features Plan **13539/P01a**

Plan 2: GCN Survey Results Plan **13539/P04**

Plan 3: Bat Survey Results Plan **13539/P06a**

Plan 4: Bird Survey Results Plan **13539/P03**



- Redline Boundary
- Cultivated/disturbed land - amenity grassland
- Cultivated/disturbed land - arable
- Standing Water
- Other tall herb and fern - ruderal
- Scrub - dense/continuous
- Broadleaved woodland - semi-natural
- Hedgerow
- Scattered Tree
- Scattered Scrub
- Japanese Knotweed
- Surveys to be completed in 2024 season and added to ES addendum

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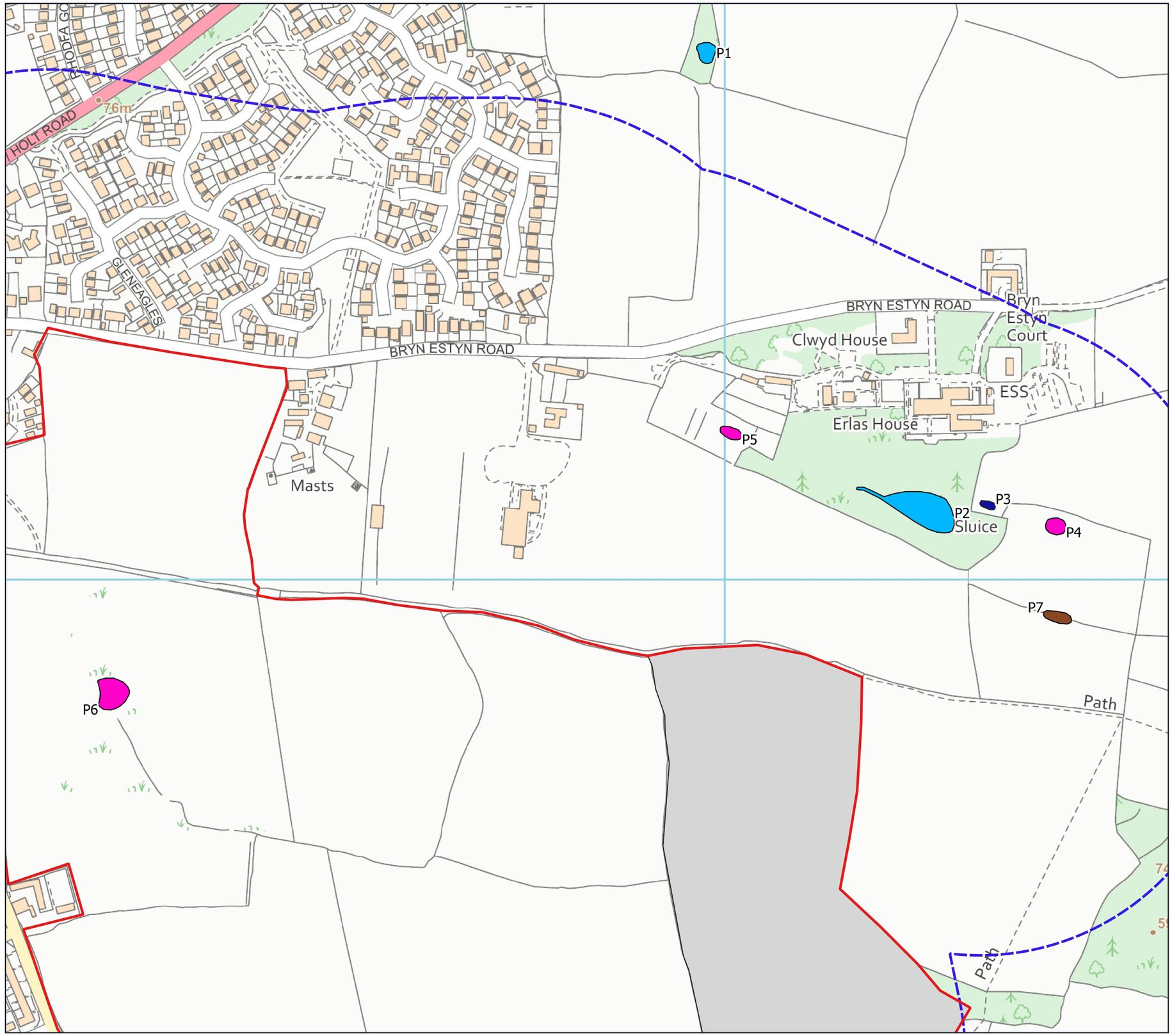
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Project	Cefn Road, Wrexham
Drawing Title	Habitat Features Plan
Scale	As Shown (Approximate)
Drawing No.	13539/P01a
Date	Februrary 2024
Checked	LJ/OM

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Legend

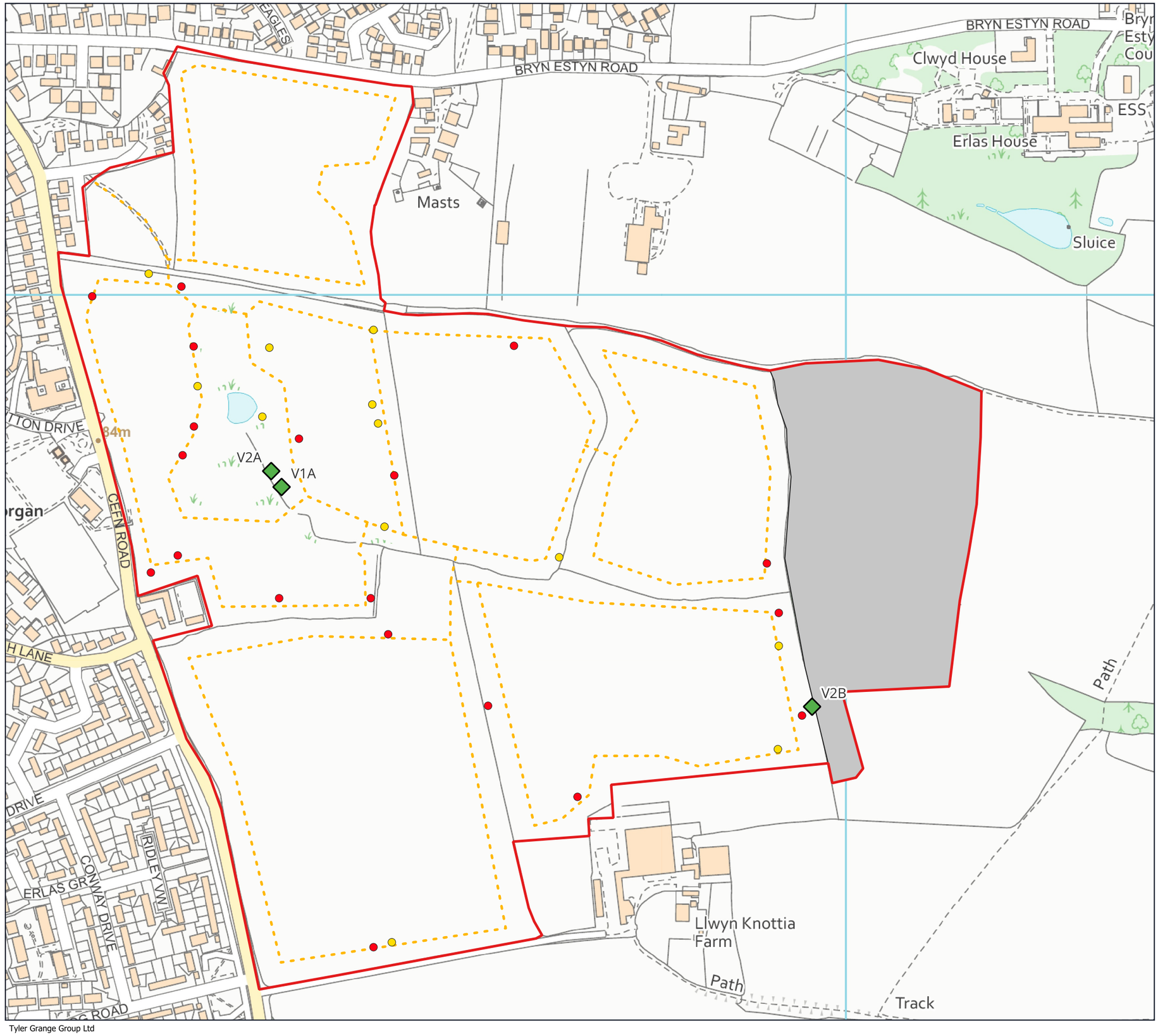
- Site Boundary
- 250m Site Buffer
- Surveyed Ponds (Inconclusive assumed positive)
- Surveyed Ponds (No GCN Recorded)
- Surveyed Ponds (GCN Recorded)
- Surveyed Ponds (Dry)
- Surveys to be completed in 2024 season and added to ES addendum

0 100 m

Project	Cefn Road, Wrexham
Drawing Title	GCN Survey Results
Scale	As Shown (Approximate)
Drawing No.	13539/P04
Date	February 2024
Checked	DP/DM

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Legend

- Site Boundary

Bat Activity Survey Results

- Common Pipstrelle
- Soprano Pipistrelle
- Brown Long-eared
- Static Detector Location
- Transect Route
- Surveys to be completed in 2024 season and added to ES addendum

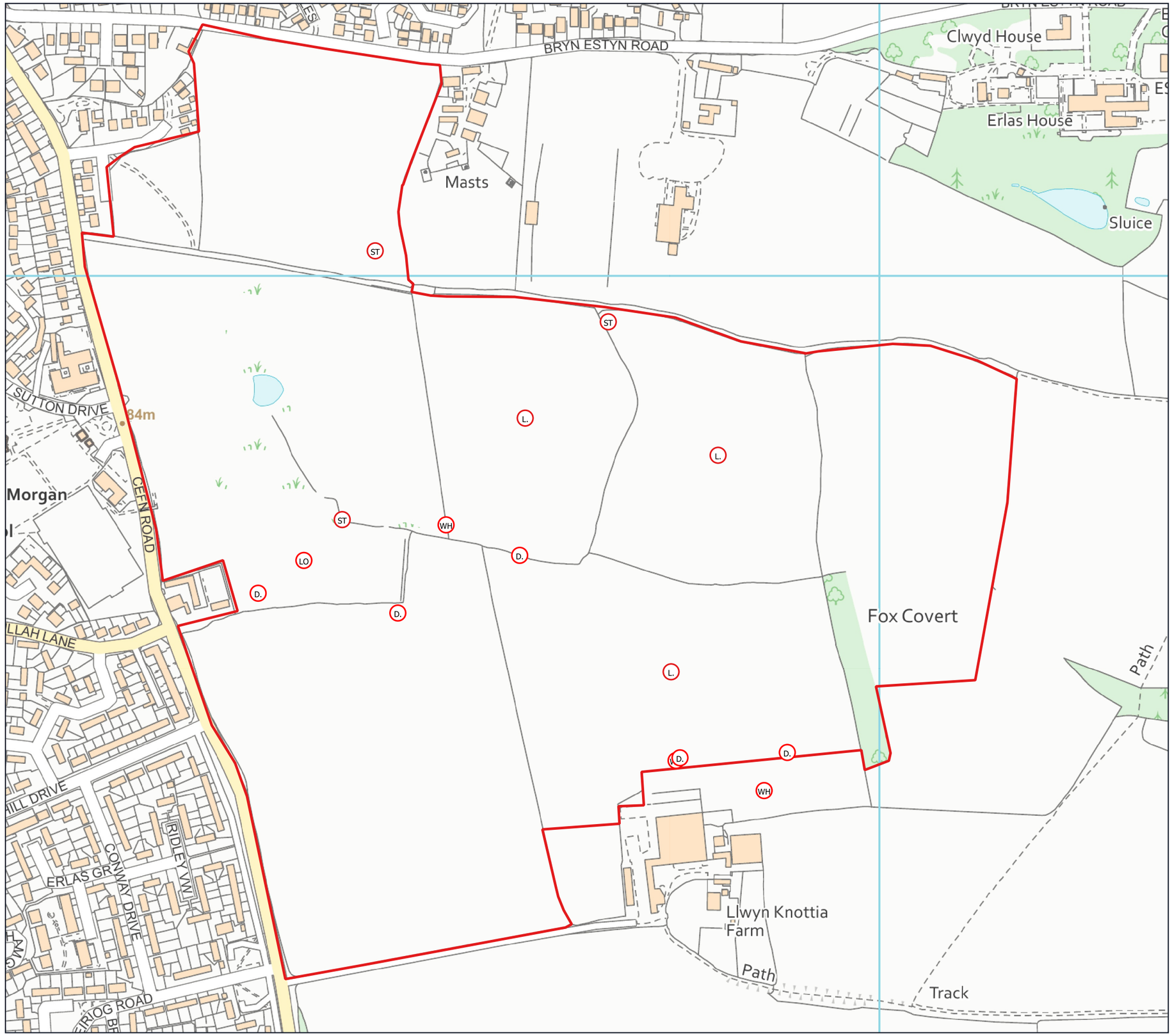
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Project	Cefn Road, Wrexham
Drawing Title	Bat Transect and Static Results Plan
Scale	As Shown (Approximate)
Drawing No.	13539/P06a
Date	February 2024
Checked	DP/DM

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Legend

- Site Boundary

Bird Territories

- L. Lapwing
- ST Song Thrush
- D. Dunnock
- WH Whitethroat
- LO Little Owl

0 100 m

Project	Cefn Road, Wrexham
Drawing Title	Breeding Bird Survey Results
Scale	As Shown (Approximate)
Drawing No.	13539/P03a
Date	March 2024
Checked	DP/DM

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