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PRELIMINARY ECOLOGICAL APPRAISAL

At

The Oaks
Oak Road
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NGR: SJ 38732 49284

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EXECUTIVE SUMMARY

United Environmental Services Ltd (UES) was commissioned by FI Facilities Management Ltd to carry out a baseline ecological survey of a parcel of land known as The Oaks, located off Oak Road, Wrexham Industrial Estate, Wrexham. A desk study and preliminary ecological appraisal (PEA) survey were undertaken on 23rd November 2022, including searches using the Multi Agency Geographic Information Centre (MAGIC) and Cofnod – North Wales Environmental Information Service.

The PEA provides an assessment of potential ecological impacts associated with the development of the land parcel. At this stage, no detailed landscaping proposals are currently available.

The land parcel has an area of approximately 23.9ha and comprises a large area dominated by dense scrub. Small areas of semi-improved grassland are present across the site including small glades amongst the scrub and pathways. The River Clywedog flows along the southern site boundary and the Redwither Brook flows along the western boundary. Both watercourses are bordered by a band of riparian woodland. Numerous buildings are present across the site and a number of ponds were known to historically be present, only one of which is now considered to still function as an aquatic habitat. Other habitats present on site include hardstanding access tracks and small areas of marshy grassland, tall ruderal vegetation, bare ground, scattered broadleaved trees and ephemeral / short perennial vegetation.

The results of the survey combined with the results of the desk study have highlighted the requirement for further work in relation to the following habitats and species:

- **Amphibians** – A great crested newt (GCN) *Triturus cristatus* impact assessment should be undertaken to assess all accessible ponds, both onsite and within 500m of the proposed development site, for their suitability to support GCNs. This impact assessment can be undertaken any time of year.

  Given the historical presence of GCNs on site and within the immediate surrounding area, it is considered highly likely that further GCN presence / absence surveys and subsequent population size class assessments (PSCA) surveys will also need to be undertaken of the onsite ponds and offsite ponds within 500m of the site. These surveys can only be undertaken from mid-March to June inclusive and require multiple survey visits (4 for presence / absence and 6 for PSCA), with at least half of the total visits for each pond undertaken during the period of mid-April to mid-May.

- **Badger –** A detailed badger *Meles meles* scoping survey of the proposed working area should be undertaken to search for any potential badger setts. If the historic badger sett or any newly discovered potential badger setts are found within the proposed development area, a badger activity survey would likely be required to assess the usage of the sett.

  The reasonable avoidance measures (RAMs) detailed in Section of this report 4.2.3 should be implemented during the construction phase of the development.

- **Bats** – Bat activity surveys should be undertaken to assess the use of the site by foraging and commuting bats. These surveys should involve transect surveys and the installation of static detectors across the site, from April to October inclusive.

A bat scoping survey should be undertaken of all buildings that have the potential to be impacted by the development (including from significant levels of disturbance), to assess their potential to support roosting bats. This survey can be undertaken any time of year. Depending on the results, further bat presence / absence surveys may be required from May to September.

A ground level tree assessment should be undertaken of all trees (including scattered trees, woodland trees and mature shrubs within areas of dense scrub) that have the potential to be impacted by the development (felling, arboricultural works or significant levels of disturbance), to assess their potential to support roosting bats. This ground level assessment can be undertaken any time of year. Depending on the results, further aerial climbing inspections and / or bat presence / absence surveys may be required from May to September.

- **Breeding birds –** A suite of breeding bird surveys should be undertaken to assess the use of the site and to inform the appropriate mitigation and compensation measures. The surveys would involve undertaking a transect survey once a month from March to August inclusive.

  Site clearance, tree felling, arboricultural works, vegetation removal (including enabling works) and building demolition should take place outside of the breeding bird season and should not be undertaken from March to August inclusive. If this is not possible and works need to take place between this period, a targeted breeding bird nest scoping survey should be conducted by a suitably qualified ecologist immediately prior to the works, or an ecological clerk of works appointed to oversee the works.

- **Designated sites –** The survey boundary encompasses the Cefn Park section of the Wrexham Industrial Estate Wildlife Site, and any development works will have a direct impact on the Wildlife Site. However, the site was designated a number of years ago and has since been left primarily unmanaged. As a result, the majority of the site has been subject to succession and is now dominated by dense scrub. Additionally, at the expense of native species, large areas of the site have been encroached by non-native invasive species, including Japanese knotweed *Reynoutria japonica* and Himalayan balsam *Impatiens glandulifera.*

  The site now contains very little grassland, only some of which appears to be species-rich and the overall site has a reduced botanical diversity as a result. Reductions in the cover of grassland and encroachment of scrub is evident when reviewing historical aerial imagery and comparing the site's current condition to when it was last surveyed in 2016-2019 (by Kingdom Ecology).

  Any proposed development within the site should be designed and located to retain the highest value habitats. The primary designation features of the site were the species-rich grasslands and the botanical species they supported, in addition to the mosaic of habitats formed. The development of part of the site provides a mechanism to secure the long-term retention and enhancement of the retained areas, to ensure that species-rich grassland can be restored, and a complex mosaic of habitats can be maintained. An ecological enhancement scheme and a long-term management plan, covering at least 30 years, should be provided as part of any planning application and should cover all retained areas. The management plan should include details of proposed monitoring surveys, to assess the effectiveness of habitat creation and enhancement, and to identify the need for remedial measures or changes to the management plan where necessary.

- **Hedgehogs –** The RAMs detailed in Section 4.2.9 of this report should be implemented during the construction phase of the development.

  To allow continued use of the site by hedgehog *Erinaceus europaeus* and to ensure commuting routes aren't blocked, fences installed on site that would block access to suitable habitat should be designed to allow passage by hedgehogs. This can either be through the choice of material e.g. choosing a fence style that naturally contains holes at the base or through the inclusion of hedgehog highways (small 13cm x 13cm holes at the base of fences).

- **Invasive species –** An invasive species method statement should be prepared to detail the control and eradication measures that will be implemented to eradicate Japanese knotweed and Himalayan balsam if present within the proposed working area, and to ensure that they do not spread across the site or onto adjacent areas.

  The wider site can be enhanced by implementing control and eradication measures for all invasive species.

- **Invertebrates** – A butterfly survey targeting dingy skipper *Erynnis tages*, grizzled skipper *Pyrgus malvae* and small heath *Coenonympha pamphilus* butterflies should be undertaken of the site. The survey should involve several transect surveys across May and June, during the flight period of all three species. The suitability of the site could be significantly increased for all three species through scrub clearance and the creation and long-term management of areas of species-rich grassland.

- **Otters** – An otter *Lutra lutra* survey should be undertaken in order to identify any holts or other signs of how otters may be using the site, particularly to determine whether any potential holts are present within the areas of scrub and woodland that lie adjacent to the watercourses at the site boundaries. This survey can be undertaken at any time of year.

- **Ponds –** Ponds should be retained and protected where possible. Specific pollution prevention measures will need to be implemented to ensure that the retained and any newly created ponds are protected during the consultation phase of the development. Where possible, this should include a 'no-works' buffer zone of at least 5m.

  If any ponds are to be removed, they should be re-created and any ponds that are considered to qualify as habitats of principal importance will need to be compensated for on a 2:1 ratio.

  At least two of the ponds historically observed on site have since dried up and no longer function as aquatic habitat due to significant scrub encroachment (Ponds 1 and 2). Due to natural succession and a lack of the management, the quality and availability of aquatic habitats on site has significantly reduced. To enhance the site and to increase the availability of aquatic habitat, previous ponds could be restored or new ponds could be created.

- **Plant communities –** A National Vegetation Classification (NVC) botanical survey should be undertaken to determine the ecological value of the grassland habitats on site and to determine whether any protected or notable plant species or communities are present. This survey should be undertaken during the peak flowering season and should be conducted from June to August inclusive, by a suitability qualified ecologist.

If any areas of species-rich grassland are due to be removed to facilitate a development, they could be compensated for through additional grassland creation and the enhancement and long-term management of retained and newly created areas.

- **Reptiles –** A reptile presence / absence survey should be between March to October, involving the deployment of artificial refugia and seven site visits. If the survey identifies the presence of reptiles, it will need to be extended to a total of 15 site visits to assess the size class of any reptile populations found.

- **Trees –** to be retained where possible, or replaced as part of a detailed landscaping scheme. Generic issues relating to root protection areas.

- **Watercourses** – specific procedures and control measures to be implemented to ensure that there is no risk of input into the watercourses, including the retention of a 10m buffer zone. The measures should be set out by the contractors prior to commencement and agreed with the local planning authority and other statutory consultees.

- **Water vole –** A 10m buffer zone should be retained along the banks of the River Clywedog and Redwither Brook, to protect water voles *Arvicola amphibius* and their habitat, if present on site.

  If a 10m buffer zone cannot be retained along both watercourses, a water vole survey should be undertaken by a suitably experienced ecologist in order to identify any burrows, latrines or other field signs indicating water vole presence. Surveys can be conducted mid-April to mid-September, but the optimal time to carry out surveys is in May and June during the peak breeding season.

- **Woodland and scrub** – The areas of woodland and mature hawthorn scrub should be retained where possible and should be protected during the construction phase of the development. Areas of woodland and scrub removed to facilitate a development should be compensated for through compensatory planting and the enhancement and ongoing management of retained areas.

Mitigation measures, as detailed in section 4, should be adhered to, which may in some cases negate the need for further survey work.

The development of part of the site provides an opportunity to secure the long-term management and ecological enhancement of the wider site. Key enhancement measures that would benefit the site include scrub removal, invasive species eradication, pond creation and restoration, and species-rich grassland creation and restoration. The site could also be enhanced though the installation of a suite of bat and bird boxes and the creation of hibernacula for amphibians and small mammals.

This report should be read with appendices 1 to 7, which include results of the desk study, GIS phase 1 habitat mapping, photographs of site and relevant statutory guidance.

1 INTRODUCTION

1.1 Author, surveyors, qualifications and scope of study area

This report is written by Tom Kenwright BSc MSc ACIEEM, UES Senior Ecologist. Tom holds a level 5 Botanical Society for Britain and Ireland (BSBI) field identification skills certificate (FISC), which certifies him as competent to undertake botanical and habitat surveys up to NVC level.

Tom is licensed by Natural Resources Wales to disturb, take and handle GCNs under licence number S091022/1.

Tom is listed as an accredited agent under the Natural Resources Wales bat survey licence of Toby Hart BSc MCIEEM PIEMA, UES Managing Director. Toby is licensed by Natural Resources Wales to disturb, take and handle all species other than greater horseshoe *Rhinolophus ferrumequinum* and lesser horseshoe *Rhinolophus hipposideros* under licence number S086508/01. Toby has deemed Tom as capable and suitably experienced in assessing the potential for buildings and trees to support roosting bats, to survey for bats using artificial light, to handle bats for identification purposes and to inspect cavities within trees and buildings for roosting bats using an endoscope.

The report provides an assessment of the potential ecological impacts associated with the proposed development of a parcel of land off Oak Road, Wrexham Industrial Estate, Wrexham.

The zone of influence considered within the scope of the survey includes all land within the red line boundary. Where relevant, other ecological resources, receptors and important habitats which are spatially separate from the site are considered.

1.2 Survey objectives

UES was commissioned in November 2022 to conduct a PEA of the proposed development site. This was completed in order to:

- Establish baseline conditions and determine the importance of ecological features present or potentially present within the survey area
- Identify key ecological constraints to the project
- Make recommendations for design options to avoid significant effects on important ecological resources at an early stage of development planning
- Identify potential requirement for further surveys for nationally or internationally protected species which may be present on site
- Identify potential requirement for mitigation or compensation, including measures that may be required based on further surveys

1.3 Proposed development and previous survey information

At this stage, no detailed proposals have been submitted to UES.

1.4 Structure of the report

This report is a baseline appraisal that forms the basis for further ecological surveys and Environmental Impact Assessments (EIA) if required. In the majority of cases the preliminary ecological assessment will not provide all the ecological data required by the Local Planning Authority to determine an application, especially in the event that protected habitat or species issues are present or likely.

This report should be read with appendices 1 to 7, which include results of the desk study, GIS phase 1 habitat mapping, photographs of site and relevant statutory guidance.

2 METHODOLOGY

This PEA comprises a desk study and a field survey. The desk study is conducted in order to collate ecological information on species and / or habitats of interest that may be present. The field survey is conducted in order to assess the habitats and their importance, both on site and in the context of their wider surroundings.

2.1 Desk study

The following resources were used to inform the desk study:

- National – Using the UK government's MAGIC website, statutorily protected sites were scoped to a distance of 10km from the application site.

- Local – a record search of designated sites and protected or otherwise notable species within 2km of the survey boundary was undertaken through Cofnod.

2.2 Field survey

An ecological walkover survey was carried out on 23rd November 2022 by Tom Kenwright. The purpose of the survey was to identify, record and map dominant habitat types within the development area and highlight any further species surveys that may be required based on the quality of those habitats. When conducting the surveys particular focus was concentrated on the following species and habitat features:

- Amphibians
- Reptiles
- Badger
- Bats
- Hazel dormouse
- Birds
- Trees
- Hedgerows
- Plant communities
- Invasive species
- Otter
- Water vole
- White-clawed crayfish

The habitats were assessed by using the phase 1 habitat survey technique, which is a system for environmental audit widely used within the environmental consultancy field. The survey was undertaken in accordance with the methodology in the 'Handbook for phase 1 habitat survey - A technique for environmental audit' (JNCC, 2010) as recommended by Natural England, and in the "Guidelines for Preliminary Ecological Appraisal" (CIEEM, 2017).

The survey area encompasses all of the land within the development footprint and the land to a distance of 30m outside it where accessible. In line with recognised guidelines, ponds were also scoped to a distance of 500m (250m radius from the survey area).

The phase 1 habitat survey methodology was extended to record any signs of habitats suitable to support protected / invasive species and any incidental observations of other noteworthy species.

2.3 Survey limitations

The survey was conducted in November when not all plant species are readily identifiable. However, sufficient vegetative identification was possible, allowing a robust assessment of habitats to be undertaken. Where habitats or botanical species of interest may be present, further botanical surveys at the appropriate time of year have been recommended. As such, this is not considered to be a limitation.

3 RESULTS

3.1 Desk study

A desk study was conducted for the proposed development site and surrounding area. Statutorily protected sites were scoped to a distance of 10km. Further results of the desk study can be found at Appendix 1 – Desk study.

3.1.1 Protected sites

There are three non-statutorily protected sites within 2km of the proposed development site:

- **Wrexham Industrial Estate Wildlife Site**
  This designation encompasses, three land parcels within the Industrial Estate, including Bryn Road (450m to the north) and Erlas Black Wood (830m to the north-west). The third land parcel is Cefn Park, which has the same boundary as the survey boundary, that is to say that the survey area is the Cefn Park parcel of the Wildlife Site.

  The following has been taken from the citation as the reason for the incorporation of the Cefn Park parcel within the Wildlife Site designation:

  "The derelict land known as Cefn Park, on the southern edge of the Industrial Estate, consist of a complex mosaic of scrub, grassland and tall herb. Species-rich grassland occurs where there is rabbit grazing with cowslip *Primula veris*, restharrow *Ononis repens*, yellow-wort *Blackstonia perfoliata*, common centaury *Centaurium erythraea* and common bird's-foot trefoil *Lotus corniculatus*. Other species of interest include dyer's greenweed *Genista tinctoria* in among scrub and grass vetchling *Lathyrus nissolia* in rank grassland. Worn paths and motorbike tracks criss-cross the site and many species present such as prickly lettuce *Lactuca serriola*, smith's pepperwort *Lepidium heterophyllum* and bristly oxtongue *Helminthotheca echioides* typify disturbed ground. A mosaic of woodland and damp grassland occurs adjacent to the River Clywedog. The woodland is dominated by mature hawthorn *Crataegus monogyna* with alder *Alnus glutinosa* and crack willow *Salix fragilis* along the river. The ground flora is sparse but dog's mercury *Mercurialis perennis*, hart's-tongue fern *Asplenium scolopendrium* and male fern *Dryopteris filix-mas* do occur. Meadowsweet *Filipendula ulmaria*, great willowherb *Epilobium hirsutum* and canary reed-grass *Phalaris arundinacea* occur in the damper patches."

  The section of the Wildlife Site at Bryn Lane encompasses a strip of species-rich grassland beside a ditch and contains similar grassland species. The land parcel at Erlas Black Wood encompasses a small area of broadleaved woodland dominated by mature oak *Quercus sp.*

- **Peter's Dingle Wildlife Site**
  Located approximately 0.6km south of the proposed development site, the designation supports ash *Fraxinus excelsior* / pedunculate oak *Quercus robur* woodland along a brook. The understorey is of wych elm *Ulmus glabra*, elder *Sambucus nigra*, hawthorn, wild privet *Ligustrum vulgare* and hazel *Corylus avellana*, the latter becoming abundant in areas where it has been coppiced. The field layer is often dominated by ivy *Hedera helix*, bramble *Rubus fruticosus agg.*, and stinging nettle *Urtica dioica*, however dog's mercury, yellow archangel *Lamium galeobdolon*, giant fescue *Festuca gigantea*, black bryony *Dioscorea communis* and harts'-tongue fern are also present.

- **Cefn Park Wildlife Site**
  Located approximately 1.45km north-west of the proposed development site, the designation supports a series of broadleaved woodlands within Cefn Park Estate. Big Wood is the largest (8.9ha) and is dominated by ash with oak, sycamore *Acer pseudoplatanus* and an occasional mature wych elm. The understorey is continuous with frequent holly *Ilex aquifolium*, young sycamore and wych elm. The woodland has a rich ground flora including dog's mercury, English bluebell *Hyacinthoides non-scripta*, wood anemone *Anemone nemorosa* and ramsons *Allium ursinum*. Rhododendron Spinney is also dominated by ash but with beech *Fagus sylvatica* and sweet chestnut *Castanea sativa* and a locally dense understorey of rhododendron *Rhododendron ponticum*. Alder, crack willow and goat willow *Salix caprea* dominate the poorly drained eastern side where great horsetail *Equisetum telmateia* and greater pond sedge *Carex riparia* occur as well as a fen dominated by common reed *Phragmites australis.*

There is a single statutorily protected site within 2km of the proposed development site:

- Afon Dyfrdwy (River Dee) SSSI[1]
  Located approximately 2km east of the proposed development site, the SSSI covers the River Dee and its floodplain. The designation covers much of the same area as the River Dee (England) SSSI and the River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC[2]. The site has been designated for its nationally important transition through a range of river types from mesotrophic to eutrophic. The site has also been designated for supporting Atlantic salmon *Salmo salar*, otter, brown trout *Salmo trutta*, bullhead *Cottus gobio*, brook lamprey *Lampetra planeri*, river lamprey *Lampetra fluviatilus,* sea lamprey *Petromyzon marinus* and club-tailed dragonfly *Gomphus vulgatissimus.*

The proposed development site lies within a SSSI Impact Risk Zone (IRZ) within which Natural England only request that they are consulted on applications for minerals, oil or gas extraction, aviation proposals or industrial / agricultural developments that could cause air pollution (including industrial processes, livestock and poultry units with floorspace >500m2, slurry lagoons & digestate stores > 750m2, manure stores > 3500t) and general combustion processes >50MW energy input.

There are sixteen statutorily protected sites (designated for ecological reasons) within 2 – 10km of site:

- Artle Dale SSSI
- Chwarel Singret SSSI
- Cloy Brook Pastures SSSI
- Dee Cliffs, Farndon SSSI
- Gatewen Marsh SSSI
- Johnstown Newt Sites SAC
- Llay Bog SSSI
- Marford Quarry SSSI
- Midland Meres and Mosses Phase 2 Ramsar
- Old Pulford Brook Meadows SSSI
- River Dee (England) SSSI
- River Dee and Bala Lake SAC
  River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC
- Sontley Marsh SSSI
- Stryt Las a'r Hafod SSSI
- Vicarage Moss SSSI
- Well Rough and Long Plantation SSSI

[1] Site of Special Scientific Interest
[2] Special Area of Conservation

3.1.2 Protected species

The following records of protected or otherwise notable species were highlighted by the environmental records search:

- Amphibians: two records of GCNs were returned from within the site boundary itself. One record is from 2004 and details 13 adults within a pond. The other record dates from 2021 and details a single adult and an egg within a pond. The locations / grid references for the records do not correlate with the waterbodies on site and so it is presumed that the records are from ponds that have dried up and are no longer present, or they are lacking accuracy and could be from any of the waterbodies on site. Numerous offsite records of GCNs were also returned from all directions, the closest of which are located approximately 62m north and 162m east. A record of a common frog *Rana temporaria* was also returned from the site and records of smooth newt *Lissotriton vulgaris*, palmate newt *Lissotriton helveticus* and common toad *Bufo bufo* were returned from within 2km.

- Badgers: three records of badger setts were returned from the site itself, two of which date from 1983 and the third from 2003. All three records were submitted by the Clwyd Badger Group. Numerous other records of setts, badger sightings and badger field signs were returned from within 2km of the site, the closest of which is located approximately 380m north of the site and details a sett within an area of scrub from 2007.

- Bats: records of brown-long eared *Plecotus auritus*, noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus,* Daubenton's *Myotis daubentonii*, lesser horseshoe *Rhinolophus hipposideros*, whiskered *Myotis mystacinus*, Brandt's *Myotis brandti* and unidentified bats species were returned. No records of bats were returned from within the site itself.

- Birds: various species records were returned from within 2km of the site, including several Species of Principal Importance and Wildlife and Countryside Act 1981 Schedule 1 species. Records of the following species were returned from within the site boundary itself: bullfinch *Pyrrhula pyrrhula*, buzzard *Buteo buteo*, blackcap *Sylvia atricapilla*, great spotted woodpecker *Dendrocopos major*, green woodpecker *Picus viridis*, chiffchaff *Phylloscopus collybita*, whitethroat *Sylvia communis* and Cetti's warbler *Cettia cetti*.

- Hazel dormouse: no records of hazel dormouse *Muscardinus avellanarius* were returned from within 2km of the proposed development site.

- Hedgehog: six records of hedgehog were returned from within 2km of the proposed development site. The closest record is located approximately 570m west and dates from 2017.

- Invertebrates: records of the following species were returned from within the site itself: common carder bee *Bombus pascuorum* (2016), red-girdled mining bee *Andrena labiata* (1998), red-tailing bumblebee *Bombus lapidarius* (2016), dingy skipper *Erynnis* tages (2021) wall butterfly *Lasiommata megera* (1998), small phoenix moth *Ecliptopera silaceata* (1972), small heath butterfly *Coenonympha pamphilus* (2021), small emerald moth *Hemistola chrysoprasaria* (1972), oak hook-tip moth *Watsonalla binaria* (1972), narrow-bordered five-spot burnet moth *Zygaena lonicerae* (2020), latticed heath moth *Chiasmia clathrata* (2007), grizzled skipper *Pyrgus malvae* (2021),

beautiful demoiselle dragonfly *Calopteryx virgo* (2019), large red damselfly *Pyrrhosoma nymphula* (2010), the spider *Styloctetor compar* (2016), brown hawker dragonfly *Aeshna grandis* (2016), southern hawker dragonfly *Aeshna cyanea* (2016), banded demoiselle *Calopteryx splendens* (2016) and migrant hawker *Aeshna mixta* (2016).

- Otter: thirteen records of otter were returned from within 2km of the proposed development site. With the exception of a shot otter from 1945, all records are located along the River Clywedog or the connected Redwither Brook. The most recent record dates from 2019 and the closest record is located approximately 360m from the site boundary.

- Reptiles: records of slow worm *Anguis fragilis*, adder *Vipera berus* and grass snake *Natrix natrix* were returned, all of which are located within Wrexham Industrial Estate, over 400m to the north-west and south-west of the site boundary. The single grass snake records date from 2018, the two slow worm and adder records date from 'before 2009' and 'before 1999', respectively.

- Vascular plants: records of the following species were returned from within the site itself: Himalayan balsam (2016), pepper saxifrage *Silaum silaus* (2009 & 2014), rough hawk's-beard *Crepis biennis* (1998 and 2014), common fleabane *Pulicaria dysenterica* (2016), common mouse-ear *Cerastium fontanum* (2016), corn mint *Mentha arvensis* (2016), cowslip (2016), creeping jenny *Lysimachia nummularia* (2016), crosswort *Cruciata laevipes* (2016), hard rush *Juncus inflexus* (2016), hoary ragwort *Jacobaea erucifolia* (2016), smooth tare *Vicia tetrasperma* (2016), square-stalked willowherb *Epilobium tetragonum* (2016), tall melilot *Melilotus altissimus* (2016), white stonecrop *Sedum album* (2016), Dyer's greenweed (2007) and yellow-wort (2016).

- Water vole: no records of water vole were returned from within 2km of the proposed development site.

- White clawed-crayfish: no records of white-clawed crayfish *Austropotamobius pallipes* were returned from within 2km of the proposed development site.

3.2 Baseline conditions – Habitats

The results of the PEA are also shown on the accompanying map at Appendix 2 – Phase 1 habitat plan. Habitats are colour-coded in accordance with the phase 1 standard. A full botanical species list for each habitat is provided at Appendix 6.

The following principle habitat types were characterised on site:

- A1.1.1 Broadleaved, semi-natural woodland
- A2.1 Dense scrub
- A3.1 Broadleaved scattered trees
- B2.2 Semi-improved neutral grassland
- B5 Marshy grassland
- B6 Species-poor, semi-improved grassland
- C3.1 Tall ruderal
- G1 Standing water
- G2 Running water

- J1.2 Amenity grassland
- J1.3 Ephemeral / short perennial
- J2.4 Fence
- J2.5 Wall
- J3.6 Buildings
- J4 Bare ground
- J5 Hardstanding

3.2.1 A1.1.1 Broad-leaved, semi-natural woodland

A band of mature riparian woodland runs along the banks of the River Clywedog on the southern site boundary and along some of the Redwither Brook at the western site boundary. These areas of woodland are dominated by alder with some crack willow, goat willow and grey willow *Salix cinerea* present. The ground flora of woodland predominantly comprises tall herbaceous woodland on the banks of the watercourses, including stinging nettle, creeping thistle *Cirsium arvense*, common hogweed *Heracleum sphondylium*, wild angelica *Angelica sylvestris*, great willowherb and bramble.

This band of riparian woodland extends northwards at the south-eastern corner of the site where additionally canopy species are present including pedunculate oak, silver birch *Betula pendula*, ash, hawthorn and elder.

A relatively large area dominated by mature hawthorn was previously mapped as woodland in the ecological assessment undertaken by Kingdom Ecology. As this area is dominated by hawthorn, with occasional other shrub / understory species such as elder, it should not be classified as woodland according to the phase 1 habitat survey methodology, which states that stands of mature hawthorn, blackthorn *Prunus spinosa* or grey willow, even if more than 5m tall, should be categorised as dense scrub. This hawthorn dominated scrub is discussed below in Section 3.2.2.

3.2.2 A2.1 Dense scrub

The majority of the site is dominated by dense scrub, comprising a mix of species. The majority of the scrub is semi-mature to mature and is dominated by either blackthorn, hawthorn, goat willow or grey willow. Additional shrub species such as elder, dog rose *Rosa canina* and bramble are present, in additional to young trees, including ash, pedunculate oak, sycamore, crab apple *Malus sylvestris* and silver birch.

The majority of the scrub is dense, allowing low levels of light to penetrate to the ground level. Consequently, large areas are lacking ground flora and common shade-tolerant species are the most abundant species, such as cleavers *Galium aparine* and ivy. Most of the scrub appears to have encroached upon areas of grassland and the margins of some stands contain remnants of the species-rich grassland with species such as pepper saxifrage, meadowsweet, common knapweed *Centaurea nigra* and common agrimony *Agrimonia eupatoria*.

The eastern section of the site contains an area of mature hawthorn scrub that was previously mapped as woodland, as detailed above in Section 3.2.1. Unlike the majority of the scrub on site, the hawthorn structure mimics woodland with the mature shrubs forming a canopy layer but without a dense understory. This has allowed for a more diverse ground that includes species such as primrose *Primula vulgaris* and dog's mercury, albeit in small quantities.

3.2.3 A3.1 Broadleaved scattered trees

There are a number of mature or semi-mature scattered trees across the site. Some are solitary, however the majority of the trees lie within the areas of dense scrub and in lines or grouped around buildings, suggesting that they have originally been planted. Tree species vary but mostly comprise oak, sycamore and ash, with some crab apple, alder and crack willow also present.

3.2.4 B2.2 Semi-improved neutral grassland

The site was originally designated in part for its species-rich grassland, however a lack of management has allowed the majority of grasslands to be lost to encroaching scrub. Small areas of semi-improved grassland remaining on site are limited to pathways and small clearings with the scrub, which have been subject to some management or scrub clearance to maintain minimal levels of access across the site. Most of the grasslands appear to have a moderate species-diversity, containing some species indicative of higher quality grassland. Despite this, many areas have significant encroaching scrub and appear to be succeeding into a lower quality rank sward, dominated by a small number of competitive and coarse grasses such as cock's-foot *Dactylis glomerata*, Yorkshire fog *Holcus lanatus* and false oat-grass *Arrhenatherum elatius*.

A small area of particularly species-rich grassland was observed (Target Note 11) and contained numerous species indicative of unimproved grassland, including pepper saxifrage, greater bird's-foot trefoil *Lotus pedunculatus*, lesser meadow-rue *Thalictrum minus*, wild carrot *Daucus carota*, common fleabane, common knapweed and a *Dactylorhiza sp* orchid. This area, in addition to most areas of grassland on site, is being encouraged by bramble and other species and is unlikely to retain its species-richness without intervention.

3.2.5 B5 Marshy grassland

A small area of marshy grassland is present within the north-eastern section of the site. This community lies within a grassland glade within the scrub, however only a small section of the glade appears to have impeded drainage. Species present include soft rush *Juncus effusus*, hard rush, wild angelica, marsh bedstraw *Galium palustre*, meadowsweet and greater bird'-foot trefoil.

3.2.6 B6 Species-poor, semi-improved grassland

Small stands of species poor grassland are present across the site. These grasslands resemble the MG1 *Arrhenatherum elatius* NVC community and are dominated by a small number of coarse and competitive grass species such as cock's-foot and false oat-grass, with a low diversity and abundance of forbs.

3.2.7 C3.1 Tall ruderal

Large stands of tall ruderal vegetation are present across the site. These areas appear to have succeeded from unmanaged grassland and are beginning to succeed into dense scrub. Species present are indicative of nutrient enrichment of a lack of management and the majority of these areas are dominated by stinging nettle with frequent common hogweed and bramble.

As with the margins of some stands of dense scrub, some areas of tall ruderal vegetation have remnants of species-rich grassland with small quantities of common knapweed, common agrimony, wild carrot, meadowsweet and pepper saxifrage present at the margins.

3.2.8 G1 Standing water

Four ponds were previously identified on site during the ecology surveys undertaken by Kingdom Ecology in 2016. Of these four ponds, Ponds 1 and 2 were found to be ephemeral waterbodies in 2016 and were subsequently found to be completely dry and no longer functioning as aquatic habitats during an updated site visit in 2019. During the walkover survey undertaken by UES, Pond 3 was found to still contain standing water (Target Note 8), Pond 1 (Target Note 6) and Pond 2 (Target Note 7) were found to be completely dry and Pond 4 could not be found (Target Note 9). The absence of Pond 4 could be due to it drying up and no longer being present, or due to a lack of access through the surrounding dense scrub.

Pond 3 is contained within shallow concrete walls and has a concrete base at least 50cm deep. The pond is shaded by the surrounding scrub and from numerous grey willow shrubs growing at the margins and from within the pond itself. The base of the pond contains a large quantity of leaf litter from the surrounding scrub and the surface of the water is almost entirely covered with common duckweed *Lemna minor* with some broadleaved pondweed *Potamogeton natans* also present. The build up of leaf litter has allowed shallower areas to form that support species such as brooklime *Veronica beccabunga* and greater willowherb.

An additional pool of water was observed at a cross junction of intersecting paths (Target Note 15). The pool is considered to be ephemeral, only holding excess standing water following periods of heavy rainfall. The survey was undertaken in winter immediately following a period of heavy rainfall and the pool had a maximum depth of approximately 20cm. The pool and surrounding area has been colonised by a number of marshy or marginal species, indicating that the areas at least remains damp for most of the year.

Three connected water-filled sinks were observed at Target Note 10.

3.2.9 G2 Running water

Two watercourses are present at the site boundaries; the River Clywedog at the southern boundary and Redwither Brook at the western boundary.

The River Clywedog appeared to be in spate at the time of the survey and evidence of debris from recent flooding events was present on the banks. The river flows west to east and meanders along the boundary, briefly breaking into two channels and forming a small island before converging in the south-eastern corner of the site. The river is shaded by a thin strip or riparian woodland and the banks are vegetated with herbaceous species as detailed above in Section 3.2.1. The invasive species Himalayan balsam was observed all along the watercourse (Appendix 3) and a single stand of Japanese knotweed was observed on the banks (Target Note 2).

Redwither Brook flows north to south through a straight linear channel that has a fast flow rate at the time of the walkover survey. The banks of the brook are partly bordered by alder and willow woodland, however the woodland is absent from the central section which is vegetated

with dense stands of tall ruderal vegetation and encroaching scrub. Himalayan balsam was observed along the entire length of the watercourse (Appendix 3).

A short section of ditch measuring approximately 37m in length runs through the northern section of the site. The ditch contained flowing water with a moderate flow rate at the time of the walkover survey, however the survey was undertaken in the winter immediately following a period of heavy rainfall. It is considered that the ditch may be dry during the spring and summer. The flows from north to south and is culverted at both ends. The banks are relatively gently sloping and are heavily shaded from the surrounding scrub, with herbaceous vegetation sporadic and limited to species such common male fern *Dryopteris filix-mas*, remote sedge *Carex remota* and hart's-tongue fern. No aquatic or emergent vegetation was observed within the ditch.

3.2.10 J1.2 Amenity grassland

Two small amenity grassland laws are present on site. The northern lawn appears to be intensively managed and subject to regular mowing. It is considered that the lawn within the centre of the site was originally subject to regular mowing but has been maintained as a short sward in recent years through a mixture of rabbit grazing and human disturbance. The lawns are dominated by perennial ryegrass *Lolium perenne* with a small diversity and abundance of forbs and other grass species such as Yorkshire fog, creeping buttercup *Ranunculus repens* and common daisy *Bellis perennis*.

3.2.11 J1.3 Ephemeral / short perennial

The areas of bare ground and hardstanding on site have been colonised by ephemeral / short perennial vegetation. The majority of this vegetation is small and sporadic and could not be mapped on the phase 1 habitat plan at Appendix 2. A small number of larger areas of continuous vegetation are present and have been mapped.

3.2.12 J2.4 Fence

Some of the site boundaries are demarcated fences, including post and wire fences and chain-link fences.

3.2.13 J2.5 Wall

Numerous concrete retaining wall are present across the site.

3.2.14 J3.6 Buildings

The site contains 24 buildings that remain from the sites previous use as part of a munitions factory and have more recently been used for recreational purposes for airsoft. The buildings are all open from floor to ceiling and vary in size.

In addition to the buildings, numerous other man-made structures are present across the site, including concrete-lined pits, retaining walls and underground walkways.

3.2.15 J4 Bare ground

Areas of unvegetated bare ground that appear to have been subject to recent clearance works are present across the site.

3.2.16 J5 Hardstanding

Numerous small areas of hardstanding and access paths are present across the site and include areas of gravel and concrete.

3.3 Baseline conditions – Protected species or resources

As part of the PEA, specific observations of wildlife were also recorded. Wildlife observations focused on protected species, invasive species or species of conservation concern. Habitats with potential to support protected species were noted with a view to follow up surveys if required.

3.3.1 Amphibians

Records of a medium population and a breeding record of GCNs (eggs) were returned from the ponds on site from 2004 and 2021. The locations / grid references for the records do not correlate with the waterbodies on site and so it so it is presumed that the records are from ponds that have dried up and are no longer present, or they are lacking accuracy and could be from any of the waterbodies on site. Numerous records of GCNs were also returned from the surrounding landscape, including from ponds within close proximity to the site. Records of smooth newt, palmate newt and common toad were also returned from within 2km.

Four ponds were previously identified on site during the ecology surveys undertaken by Kingdom Ecology in 2016. Of these four ponds, Ponds 1 and 2 were found to be ephemeral waterbodies in 2016 and were subsequently found to be completely dry and no longer functioning as aquatic habitats during an updated site visit in 2019. During the walkover survey undertaken by UES, Pond 3 was found to still contain standing water, Ponds 1 and 2 were found to be completely dry and Pond 4 could not be found. The absence of Pond 4 could be due to it drying up and no longer being present, or due to a lack of access through the surrounding dense scrub.

Environmental DNA (eDNA) surveys of Ponds 1, 3 and 4 were undertaken by Kingdom Ecology in 2016 or 2017 and a positive result indicating GCN presence was only returned from Pond 4.

Numerous other ponds are present within 500m of the proposed development site, many of which also have records of supporting GCNs. Oak Road runs along the northern site boundary and has the potential to act as a barrier to amphibian movement, however the offsite ponds that lie to the east, south and west are well connected to the site through suitable terrestrial habitat.

The River Clywedog and Redwither Brook are considered to be unsuitable to support GCNs due to their fast flow rate.

The terrestrial habitats within the development footprint are broadly suitable for GCNs and other amphibians. The areas of woodland, scrub and semi-improved grassland habitats provide an array of moderate to high quality opportunities for foraging and commuting amphibians. Additionally, there are potential hibernation opportunities in the exposed tree root systems, dense vegetation / leaf litter within the areas of scrub and woodland and rubble piles on site.

3.3.2 Reptiles

Records of common lizard, slow worm, grass snake and adder were returned from the local area. No reptiles were observed on site during the walkover survey. Historic reptile surveys of the site in 1999 recorded slow worm and a juvenile adder. No reptiles were observed on site during reptile presence / absence surveys undertaken by Kingdom Ecology in 2016.

It is considered that the site is less suitable for reptiles than in 1999 and 2016 due a lack of management and the significant encroachment of dense scrub and a reduction of grassland habitats and botanical diversity. Despite this the areas of grassland, woodland edge and scrub on site continue to provide suitable reptile habitats and provide foraging, commuting, basking and hibernating opportunities for slow worm, grass snake and common lizard. The watercourses and ponds on site and at the site boundaries further provide suitable foraging habitat for grass snake, which predominantly predate amphibians. The habitats on site are considered to be broadly unsuitable to support adders, which are specialists of heathland, moorland, coastal and woodland edges habitats.

Oaks Road runs along the northern site boundary and has the potential to act as a barrier to reptile movement, however the site is partially connected to other areas of suitable habitat within the wider landscape.

3.3.3 Badger

Three records of badger setts were returned from the site itself, two of which date from 1983 and the third from 2003.

A single badger sett with at least five entrance burrows and suspected to have been a main or subsidiary badger sett was observed on site by Kingdom Ecology in 2016, and was confirmed to still be active in 2019 (see Target Note 3 for location). A small number of badger paths and latrines were also identified across the site in 2016 and 2019.

No definitive evidence of badger activity was observed on site during the walkover survey undertaken by UES. A short section of mammal path that could be attributable to badgers was observed at the eastern site boundary (Target Note 13), however no evidence of badger activity was found to be associated with the path. The known badger sett on site was not observed during the survey, however a detailed search was not undertaken due to the size of the site, density of scrub and time constraints.

The habitats on site provide moderate-high quality foraging and commuting habitat for badgers and the areas of dense scrub and woodland on site provide sheltered sett building opportunities.

3.3.4 Bats

Bat activity surveys undertaken by Kingdom Ecology in 2016 recorded common pipistrelle, soprano pipistrelle, noctule, Daubenton's and Natterer's *Myotis nattereri* bats using the site for foraging and commuting purposes. No records of bats were returned from within the site boundary, however in addition to the above species, records of brown long-eared, lesser horseshoe, whiskered and Brandt's bats were returned from the surrounding areas.

There are numerous buildings on site, however a full assessment of the potential for buildings to support roosting bats was not undertaken as part of the walkover survey. Despite this, a number of buildings appear to have some suitability.

A full ground level assessment of the potential for trees to support bats wasn't undertaken during the walkover survey. However, potential roosting features that could be used by roosting bats were incidentally observed within a number of trees on site (see Appendix 2 – Target Note 4) and other trees and mature shrubs within the areas of dense scrub and woodland on site have the potential to contain roosting features that could support roosting bats.

The site is predominantly composed of dense scrub interspersed with areas of grassland, providing moderate quality habitat for foraging and commuting bats. In addition, the site contains pockets of higher quality bat foraging and commuting habitat, including ponds, woodland and watercourses.

3.3.5 Hazel dormouse

No records of hazel dormouse were returned from within 2km of the proposed development site and they are not known to be present within the local area.

The large areas of scrub and the smaller areas of woodland provide some suitable habitat, however the majority of these habitats are not particularly species rich and are lacking sufficient quantities of key species such as hazel and honeysuckle *Lonicera periclymenum*. Additionally, the site is isolated from larger areas of suitable woodland habitat within the wider landscape by large continuous urbanised areas and agricultural fields.

Hazel dormice are not considered to be present on site or within the immediate vicinity of the proposed development site.

3.3.6 Birds

Although a targeted bird survey was not conducted during the site visit, the following bird species were recorded whilst on site: blue tit *Cyanistes caeruleus*, great tit *Parus major*, woodpigeon *Columba palumbus*, robin *Erithacus rubecula*, goldfinch *Carduelis carduelis*, blackbird *Turdus merula*, long-tailed tit *Aegithalos caudatus*, wren *Troglodytes Troglodytes*, starling *Sturnus vulgaris* and buzzard.

The areas of woodland, dense scrub, ponds, watercourses, scattered trees and buildings all provide suitable nesting opportunities for breeding birds in the spring and summer.

3.3.7 Trees

There are no tree species on site which are afforded statutory protection. Individual and groups of trees however may be subject to a tree preservation order (TPO).

3.3.8 Hedgerows

There are no hedgerows on site or at the site boundaries.

3.3.9 Plant communities

The watercourses, ponds, woodland and semi-improved grassland habitats on site may qualify as habitats of principal importance. Habitats of Principal Importance are material planning considerations under the Environment (Wales) Act 2016.

3.3.10 Invasive species

Evidence of Himalayan balsam was observed across a large area within the southern section of the site and along the watercourses at the site boundaries (see Appendix 3). Two stands of Japanese knotweed were observed on site, including a single small stand (Target Note 2) and a large stand at (Target Note 1).

3.3.11 Otter

Thirteen records of otter were returned from within 2km of the proposed development site. With the exception of a shot otter from 1945, all records are located along the River Clywedog or the connected Redwither Brook. The most recent record date from 2019 and the closest record is located approximately 360m from the site boundary.

The River Clywedog and the Redwither Brook at the southern and western site boundaries are suitable for use by otter and provide foraging, commuting, resting and holt building opportunities. Otters are known to use both watercourses and the onsite areas of woodland and scrub that lie adjacent to the watercourses also have the potential to by otters for sheltering and holt building.

3.3.12 Water vole

No records of water vole were returned from within 2km of the proposed development site. No evidence of water vole activity was observed during the walkover survey, however a detailed search of the watercourses were not undertaken.

The River Clywedog and the Redwither Brook at the southern and western site boundaries appear to be broadly suitable for use by water vole and provide foraging, commuting, burrowing opportunities.

3.3.13 White-clawed crayfish

No records of white-clawed crayfish were returned from within 2km of the proposed development site. The habitats on site are considered to be unsuitable to support this species as the River Clywedog and the Redwither Brook at the site boundaries are heavily vegetated or shaded and lack the sufficient substrate to provide refugia, breeding and foraging opportunities.

White-clawed crayfish are not considered to be present on site or within the immediate vicinity of the site.

3.3.14 Hedgehog

Numerous records of hedgehog were returned from within 2km of the proposed development site and records of hedgehog were returned from within 0.57km from the site. The areas of woodland, scrub and grassland on site provide suitable foraging and commuting opportunities for hedgehogs and the woodland and scrub provide suitable sheltering and hibernating opportunities.

3.3.15 Invertebrates

General invertebrate assemblage

A suite of terrestrial invertebrate surveys was undertaken of the site by Andy Jukes, a professional entomologist, in 2016, the result of which were incorporated into the ecological assessment of the site by Kingdom Ecology. The only protected, key or notable species observed on site during the surveys were the three butterfly species of principal importance detailed below.

The survey found that the habitats of greatest value for invertebrates were those associated with the industrial heritage of the site, including the flowery short swards, taller grassland swards, ephemeral pools and scrub fringe. The woodland of the eastern side of the site also presented some opportunities for localised and high-fidelity species, but the area was degraded owing to off-road biking and lack of suitable management. The assessment suggested that this area could be made to be of higher value through suitable management.

The survey suggested that the mosaic of habitats present was of value to invertebrates as it offered a range of opportunities for nesting and breeding in close proximity to the foraging locations.

Since the survey in 2016, the site has been unmanaged and significant scrub encroachment has resulted in a reduction in grassland habitats and the complete drying of ephemeral pools. The presence of these features and the mosaic of habitats that gave the site value for invertebrates has been lost to large homogeneous stands of dense scrub. As such, it is considered that the site will have reduced in quality compared to when surveyed in 2016. It is considered that an updated general invertebrate survey is not required as a result.

Butterfly Species of Principal Importance

Numerous records of dingy skipper, grizzled skipper and small heath butterflies were returned from the site itself and from within 2km of the site. All three species are listed as Species of

Principal Importance under Section 7 of the Environment (Wales) Act 2016, making them a material planning consideration.

All three species were recorded on site during the invertebrate surveys undertaken in 2016. Numerous small heath butterflies were observed and were suspected to be breeding on site. A small number of dingy skipper were observed and it was suspected that the population was fragile due to a lack of significant habitat and ongoing scrub encroachment. A single grizzled skipper was observed on site during the surveys, and it was suggested that if breeding on site, the site is likely susceptible to loss of the species due to ongoing scrub encroachment.

The site has reduced in quality over the last 20 years due to a lack of management and scrub encroachment of grasslands has resulted in a reduction of both foraging resources for adults and larval food plants, namely common bird's-foot trefoil, common agrimony, creeping cinquefoil *Potentilla reptans*, wild strawberry *Fragaria vesca* and fescues *Festuca spp.,* bent grasses *Agrostis sp.*. and meadow grasses *Poa sp..* Some small areas of suitable habitat remain on site and all three species may still be present.

4 EVALUATION AND RECOMMENDATIONS

This section provides a brief assessment of the likely impacts associated with the proposed development on the receptors identified during the walkover survey and desk study. It also includes any mitigation and compensation measures which may be required for the proposed development to proceed.

4.1 Habitats

4.1.1 Designated sites

The sites identified during the desk study were cross-referenced with the survey area relevant to this report. The closest statutorily protected site is Afon Dyfrdwy (River Dee) SSSI, which lies approximately 2km to the east of the proposed development site. Due to the distance from the site and the type of development, it is considered that the proposals wont have a significant adverse impact upon this or any other designated site in the local area, as backed up by the details of the SSSI IRZ that the site lies in and the limited types of development that require consideration.

The survey boundary encompasses the Cefn Park section of the Wrexham Industrial Estate Wildlife Site, and any development works will have a direct impact on the Wildlife Site. However, the site was designated a number of years ago and has since been left primarily unmanaged. As a result, the majority of the site has been subject to succession and is now dominated by dense scrub. Additionally, at the expense of native species, large areas of the site have been encroached by non-native invasive species, including Japanese knotweed and Himalayan balsam.

The site now contains very little grassland, only some of which appears to be species-rich and the overall site has a reduced botanical diversity as a result. Reductions in the cover of grassland and encroachment of scrub is evident when reviewing historical aerial imagery and comparing the site's current condition to when it was last surveyed in 2016-2019 (by Kingdom Ecology).

Any proposed development within the site should be designed and located to retain the highest value habitats. The primary designation features of the site were the species-rich grasslands and the botanical species they supported, in addition to the mosaic of habitats formed. The development of part of the site provides a mechanism to secure for the long-term retention and enhancement of the retained areas, to ensure that species-rich grassland can be restored, and a complex mosaic of habitats can be maintained. An ecological enhancement scheme and a long-term management plan, covering at least 30 years, should be provided as part of any planning application and should cover all retained areas. The management plan should include details of proposed monitoring surveys, to assess the effectiveness of habitat creation and enhancement, and to identify the need for remedial measures or changes to the management plan where necessary.

Given the distances from the site and the scale of development, it is considered unlikely that the proposed development will have any direct or indirect impact on any other non-statutorily designated sites. The proposed development is purely industrial / commercial and does not have a residential aspect. As such, it is considered that the proposed development will not result in any additional significant recreational pressure upon any of the protected sites within the local area.

4.1.2 Trees

There are a number of scattered trees that lie outside of the areas of woodland on site.

Construction impacts

Site clearance and setting out may involve the direct loss of trees on site as an ecological resource, or may result in damage to any trees which are to be retained.

Mitigation

A BS5837 arboricultural survey should be undertaken to catalogue the location and species of the trees within the proposed development area. Trees, in particular those forming a linear feature across the site, should be retained where possible. Root protection areas (RPAs) should be established and implemented around the trees which are to be retained. These areas should be adequately protected by appropriately designed protective barriers and ground protection throughout the entire development process.

Compensation

If any trees are to be removed, they should be replaced accordingly as part of a detailed landscaping scheme, with only native species to be planted.

Operational impacts

No operational impacts are envisaged.

4.1.3 Woodland and dense scrub

There are numerous areas of dense scrub and woodland on site.

Construction impacts

The woodland and areas of dense scrub could be lost, permanently damaged, altered and / or disturbed by the construction activities.

Mitigation

The areas of woodland and mature hawthorn scrub should be retained where possible and should be protected during the construction phase of the development. Retained areas of woodland and scrub should be fenced off to protect the root systems of the trees and shrubs within, and no contractors should access these areas unless authorised to do so or for reasons related to working within them (e.g. protecting it from construction activities). No materials should be stored in the woodland or scrub and no temporary or permanent external lighting should be directed onto retained woodland or areas of dense scrub.

Compensation

Areas of woodland and scrub removed to facilitate a development should be compensated for through compensatory planting and the enhancement and ongoing management of retained areas.

Operational impacts

No operational impacts are envisaged.

4.1.4 Watercourses

The River Clywedog flows along the southern site boundary and the Redwither Brook flows along the western site boundary. A short section of ditch with flowing water is present within the northern section of the site and is culverted at both ends.

Construction impacts

Construction works adjacent to the River Clywedog or Redwither Brook could result in disturbance and / or pollution to the watercourses.

Mitigation

Specific procedures and control measures will need to be implemented to ensure that there is no risk of input into the watercourse or the ditch. These measures should be set out by the contractors prior to the commencement of works and will need to be agreed with the Local Planning Authority and other statutory consultees. These measures should conform to best practice guidance and include the cleaning of all machinery and equipment before use on site to prevent contamination of the watercourse with foreign abiotic and biotic materials.

Where possible, buffer zones of 10m from the top of the bank should be retained along the length of the watercourses, to protect them from disturbance and to reduce the risk of pollution. The buffer zones should be retained and enhanced as ecological corridors. The buffer zones should be adequately fenced off and no vegetation clearance or other construction activities should take place within it unless part of ecological enhancement works.

Operational impacts

Significant issues could include general degradation to the stream and ditch by way of litter or access pressures.

Mitigation

Bins and other waste disposal / recycling facilities should be available in the immediate surrounding area.

4.1.5 Plant communities

Some of the areas of grassland on site are species-rich, have the potential to qualify as unimproved grassland and may meet the criteria to qualify as the lowland meadow Habitat of Principal Importance.

Construction impacts

The development proposals could result in the removal or damage of this habitat.

Mitigation

To determine the ecological value of the grassland habitats on site and to determine whether any protected or notable plant species or communities are present, a further NVC botanical survey should be undertaken. This survey should be undertaken during the peak flowering season and should be conducted from June to August inclusive, by a suitability qualified ecologist.

The result of the further survey will determine the compensation and mitigation requirements.

Compensation and enhancement

If any areas of species-rich grassland are due to be removed to facilitate a development, they could be compensated for through additional grassland creation and the enhancement and long-term management of retained and newly created areas.

Operational impacts

No operational impacts are envisaged.

4.1.6 Ponds

Four ponds have historically been identified on site, at least two of which have dried up and are no longer present.

Construction impacts

Site clearance and construction works may result in the loss of ponds on site and may result in the disturbance and / or pollution of retained ponds.

Mitigation

Ponds should be retained and protected where possible.

Specific pollution prevention measures will need to be implemented to ensure that the retained and any newly created ponds are protected during the consultation phase of the development. Where possible, this should include a ‘no-works’ buffer zone of at least 5m.

Compensation and enhancement

If any ponds are to be removed, they should be re-created and any ponds that are considered to qualify as habitats of principal importance will need to be compensated for on a 2:1 ratio. Newly created ponds should be designed and managed in conjunction with retained ponds to provide a range of aquatic habitats to benefit a greater diversity of species e.g. a mix of open water and late successional swamp communities. Newly created and retained ponds should also be designed and enhanced to target protected or notable species that known to be present on site or within the local area e.g. GCNs.

At least two of the ponds historically observed on site have since dried up and no longer function as aquatic habitat due to significant scrub encroachment (Ponds 1 and 2). Pond 4 could not be found during the walkover survey, likely because it has also dried up and is no longer present. Due to natural succession and a lack of the management, the quality and

availability of aquatic habitats on site has significantly reduced. To enhance the site and to increase the availability of aquatic habitat, previous ponds could be restored, or new ponds could be created.

Operational impacts

Significant issues could include general degradation to the ponds by way of litter or access pressures.

Mitigation

Bins and other waste disposal / recycling facilities should be available in the immediate surrounding area.

4.2 Species

4.2.1 Amphibians

Four ponds have historically been identified on site, at least two of which is have dried up and are no longer present. GCNs and other common amphibian species are known to have historically used the onsite ponds for breeding, in addition to numerous ponds within the surrounding landscape. The site contains large areas of moderate and high-quality foraging, commuting habitat and it's considered that GCNs are likely to still be present on site.

Construction impacts

Potential impacts include direct harm, injury and / or death to individuals and the loss or degradation of aquatic breeding and foraging habitat and terrestrial commuting, foraging and hibernating habitat.

Mitigation

A GCN impact assessment should be undertaken to assess all accessible ponds, both onsite and within 500m of the proposed development site, for their suitability to support GCNs. This impact assessment can be undertaken any time of year.

Given the historical presence of GCNs on site and within the immediate surrounding area, it is considered highly likely that further GCN presence / absence surveys and subsequent PSCA surveys will also need to be undertaken of the onsite ponds and of offsite ponds within 500m of the site. These surveys can only be undertaken from mid-March to June inclusive and require multiple survey visits (4 for presence / absence and 6 for PSCA), with at least half of the total visits for each pond undertaken during the period of mid-April to mid-May.

If GCNs are found to be present onsite or within the immediate vicinity, a European protected species (EPS) mitigation licence will need to be granted by Natural Resources Wales. This EPS licence can only be granted once planning permission has been secured, and will need to be in place prior to the start of any works on site. Natural Resources Wales aim to process licence applications within 30 working days. As part of a licence, a suite of mitigation measures will be required, including the installation of newt fencing and a period of trapping and translocation to an established receptor site.

Compensation and enhancement

Areas of suitable GCN terrestrial and aquatic habitat should be retained and protected as part of the development. If any terrestrial or aquatic habitat used by GCNs is due to be lost, compensatory habitat will need to be created. The requirement for compensatory habitat creation will be determined following the further surveys.

At least two of the ponds historically observed on site have since dried up and no longer function as aquatic habitats due to significant scrub encroachment (Pond 1 and 2). Pond 4 could not be found during the walkover survey, likely because it has also dried up and is no longer present. Due to natural succession and a lack of the management, the quality and availability of aquatic habitats on site has significantly reduced. To enhance the site and to increase the suitability of the site to support GCNs and other amphibians, previous ponds could be restored, or additional ponds created within the retained areas of the site.

Operational impacts

To be determined following the further surveys.

4.2.2 Reptiles

The site provides an array of habitats on site that are suitable to support common lizard, slow worm and grass snake, all three of which are known to be present in the local area.

Construction impacts

If reptiles are present during the construction activities, they could be directly harmed. The development could also result in a loss of suitable foraging habitat and the severance of commuting corridors across the site.

Mitigation

A reptile presence / absence survey should be undertaken by a suitably experienced ecologist, involving the deployment of artificial refugia and seven site visits between March to October inclusive. If the survey identifies the presence of reptiles, it will need to be extended to a total of 15 site visits to assess the size class of any reptile populations found. The survey results will then be used to inform the necessary mitigation and compensation measures.

Based on the results of this further survey work, a reptile mitigation strategy may be required for submission with the planning application, which will detail how reptiles will be safeguarded throughout the development.

Where possible, suitable reptile habitat should be retained and protected as part of the development. If any habitat used by reptiles is due to be lost, compensatory habitat will need to be created, the requirement for which will be determined following the further surveys.

Operational impacts

To be assessed following the further surveys.

4.2.3 Badger

Three records of badger setts were returned from the site itself, two of which date from 1983 and the third from 2003. A single badger sett with at least five entrance burrows and suspected to have been a main or subsidiary badger sett was observed on site by Kingdom Ecology in 2016 and was confirmed to still be active in 2019 (see Target Note 3 for location).

Construction impacts

Construction activities without mitigation could result in direct harm to badgers, disturbance, sett collapse, sett abandonment and loss of foraging habitats.

Mitigation

A detailed badger scoping survey of the proposed working area should be undertaken to search for any potential badger setts. If the historic badger activity sett or any newly discovered potential badger setts are found within the proposed development area, a badger activity survey would likely be required to assess the usage of the sett. The survey would monitor the sett to determine the level of activity, the number of badgers using the sett and confirm the type of sett (main, annexe, subsidiary or outlier). The surveys will also monitor how badgers are using the site in order to inform any necessary mitigation or compensation measures.

Regardless of whether any badger setts are present on site or due to be impacted by the proposed development, badgers are known to have historically used the site and are known to be present in the local area. As such, the following reasonable avoidance measures (RAMs) should be implemented during the construction phase of the development, to protect badgers that may use the site for foraging or commuting purposes at the time of the works:

The following RAMs should be implemented on site during the construction phase of the development:

- No trenches or excavations will be left open overnight. They will be backfilled or covered with board, or alternatively fitted with a means of escape for any badgers (or other animal) which may become trapped within, such as a plank or slope leading out of the bottom of the excavation at an angle of 45°. All excavations left open overnight will be checked for trapped wildlife in the morning.

- Any pipes will be stored with caps on to prevent entry by badgers and other animals, and materials such as barbed wire will be stored so that animals cannot become entangled in them.

- Any chemicals or harmful materials will be stored so that they cannot be accessed by badgers or other animals.

- Excavations will be checked immediately before they are backfilled to ensure that no animals have become trapped.

Additional mitigation measures may be required depending on the results of the detailed badger scoping survey and further details of the development proposals.

Operational impacts

To be assessed following the further surveys.

4.2.4 Bats

There are a number of trees and buildings on site which may be suitable to support roosting bats. The habitats on site provide moderate-high quality foraging and commuting habitat for bats and the site has the potential to be used by a range of species, including lesser horseshoe bats.

Construction impacts

If bats are roosting within the buildings or trees during site clearance and demolition, they are at risk of direct harm and disturbance and the roosts will be lost permanently. Inappropriate landscaping could also result in the severing of commuting corridors used by bats as well as the loss of foraging habitats.

Mitigation

Bat activity surveys should be undertaken to assess the use of the site by foraging and commuting bats. These surveys should involve transect surveys and the installation of static detectors across the site, from April to October inclusive.

A bat scoping survey should be undertaken of all buildings that have the potential to be impacted by the development (including from significant levels of disturbance), to assess their potential to support roosting bats. This survey can be undertaken any time of year.

If any buildings due to be impacted are found to have the potential to support roosting bats, further bat presence / absence surveys will be required and can be undertaken from May to September inclusive, with at least half of the surveys of each building undertaken during the peak survey period of May to August inclusive.

A ground level tree assessment should be undertaken of all trees (including scattered trees, woodland trees and mature shrubs within areas of dense scrub) that have the potential to be impacted by the development (felling, arboricultural works or significant levels of disturbance), to assess their potential to support roosting bats. This ground level assessment can be undertaken any time of year.

If any trees or mature shrubs due to be adversely impacted are found to have the potential to support roosting bats, further aerial tree inspections will be required and can be undertaken at any time of year. If any potential roosting features are found to still be suitable following the inspections, further bat presence / absence surveys or further aerial inspections will be required and can be undertaken from May to September inclusive, with at least half of the surveys of each tree undertaken during the peak survey period of May to August inclusive.

The survey results will inform the requirement for further mitigation or compensation measures. It should be noted that if bats are found to be roosting on site, these further measures may include an application for an EPS mitigation licence from Natural Resources Wales.

Enhancements

The provision of bat boxes as part of the development proposals would increase the roosting opportunities for bats on site but would also increase the ecological value of the site. At the time of writing this report no detailed plans are available, but bat boxes that could be used on site include:

- Schwegler 1FF box (affixed to trees or buildings)
- Schwegler 2F box (affixed to trees or buildings)
- Schwegler 1FW hibernation box (affixed to trees)
- Schwegler 2FR bat tube (installed in connected pairs or threes into the external walls of buildings)

Bat boxes affixed to trees should be fitted at a height of between 5 and 6m metres on a southerly aspect.

Bat boxes affixed to, or installed into the external walls of buildings should be installed just below the eaves / roof height. No detailed lighting proposals are as yet available to UES, however care must be taken when installing any new lighting to ensure that light spillage onto the bat boxes is minimised. This may require the use of cowling or relocation of the bat box or lighting.

It should be noted that once bat inhabits a bat box, they may only be disturbed by a licensed bat worker.

Operational impacts

To be fully assessed following the further surveys. A wildlife friendly lighting plan should be designed for the site, with particular emphasis on avoiding lighting spill onto any installed bat boxes and retained areas of moderate or high-quality habitat that are used as key areas by foraging and commuting bats. This lighting plan will need to be informed by the results of the further survey, however as a general principle, lighting should avoid overspill onto areas of woodland, watercourses, ponds, large areas of dense scrub and areas of species-rich grassland.

4.2.5 Birds

There are a number of habitats, such as woodland, hedgerows, dense scrub, ponds, species-rich grassland, buildings and mature trees which could support breeding birds. Provided suitable cavities are present, there is some potential for trees on site to support breeding barn owls.

Construction impacts

Tree felling, arboricultural works, site clearance, vegetation removal and demolition works could result in the direct loss of nests, any individuals within the nests and of available nesting territories if conducted during the breeding season.

Mitigation

Given the quality and range of habitats on site, a suite of breeding bird surveys should be undertaken to assess the use of the site and to inform the appropriate mitigation and compensation measures. The surveys would involve undertaking a transect survey once a month from March to August inclusive.

An assessment of the potential for trees to support breeding barn owls should be undertaken of any trees that have the potential to be adversely impacted by the proposals (felling,

arboricultural works or subject to significant levels of disturbance). This assessment can be undertaken simultaneously with the ground level tree assessment for bats and can be undertaken any time of year. The requirement for further surveys, mitigation or compensation measures with regards to breeding barn owls will be informed by the results of this survey.

Site clearance, tree felling, abroricultural works, vegetation removal (including enabling works) and building demolition should take place outside of the breeding bird season and should not be undertaken from March to August inclusive. If this is not possible and works need to take place between this period, a targeted breeding bird nest scoping survey should be conducted by a suitably qualified ecologist immediately prior to the works, or an ecological clerk of works appointed to oversee the works.

Compensation and enhancement

If extensive areas of vegetation are to be removed, consideration should be given to providing replacement habitat for foraging and nesting birds by incorporating native species tree, shrub or scrub planting as part of the landscaping proposals. The full requirements of compensatory habitat creation will depend on the development proposals and will be informed by the breeding bird surveys.

Compensation for the loss of nesting habitat and the enhancing of the nesting habitat on site can also be provided through the provision of bird nest boxes. At the time of writing this report no detailed plans are available, but bird boxes that could be used on site include:

- Schwegler 1B nest box (affixed to trees)
- Schwegler 1SP sparrow terrace (affixed to building below the eaves)
- Schwegler 2H robin nest box (affixed to trees)
- Schwegler 3S starling nest box (affixed to trees or buildings)
- Schwegler 1MR Avianex box (affixed to trees or buildings)
- Manthorpe swift nest brick (incorporated into the external walls of buildings)
- Barn owl box (affixed to trees)

Bird boxes should be sited at a minimum height of three metres. Unless there are trees which shade the box during the day, the boxes should be oriented between north and east, thus avoiding strong sunlight and the wettest winds.

<u>Operational impacts</u>

Inappropriate management of the habitats on site could degrade them and render them unsuitable for wildlife.

Mitigation

It is important to implement good horticultural practice in any landscaping scheme, including the use of peat-free composts, mulches and soil conditioners. The use of pesticides (herbicides, insecticides, fungicides and slug pellets) should be discouraged to prevent fatal effects on the food chain. Any pesticides used should be non-residual.

Excessive removal or pruning of trees and hedgerows should be avoided to maximise the growth and plant matter available to wildlife. Pruning should be left until late winter to leave seeds and berries for wintering wildlife and to ensure no impact on breeding and nesting birds.

4.2.6 Invasive species

Two stands of Japanese knotweed are present on site (Target Notes 1 & 2) and the southern and western sections of the site contain scattered Himalayan balsam plants. Japanese knotweed is listed under Schedule 9 of the Wildlife and Countryside Act 1981 and Himalayan balsam is listed under Schedule 2 of the Invasive Alien Species (Enforcement and Permitting) Order 2019. As such, it is an offence to plant or otherwise cause these species to grow or spread into the wild, including as a result of development works.

Construction impacts

Site clearance and setting out could result in the disturbance and dispersal of Japanese knotweed and Himalayan balsam on and off site.

Mitigation

If any invasive species are present within the proposed working area, they will need to be eradicated prior to the start of works within close proximity (7m) of the infected area. An invasive species method statement should be prepared to detail the control and eradication measures that will be implemented to eradicate invasive species and to ensure that they do not spread across the site or onto adjacent areas. It is essential that a competent and qualified person carries out any herbicide treatment.

Enhancement

The wider site can be enhanced by implementing control and eradication measures of all invasive species. This will benefit native flora and would constitute an ecological enhancement.

Operational impacts

If Japanese knotweed and Himalayan balsam are eradicated from the working area prior to the start of works on site, no further operational impacts are envisaged. However, complete eradication is an ongoing process, and if it is not treated as such, it can return and continue to spread. This could become more acute with increased activity on site.

4.2.7 Otter

Otters are known to be present in the local area and to use the River Clywedog at the southern site boundary and the Redwither Brook at the western boundary.

Construction impacts

The proposed development could potentially cause direct harm, injury and / or death to individuals. It could also cause disturbance and the direct loss of suitable habitat, as well as indirect habitat degradation through changes in the water quality.

Mitigation

An otter survey should be undertaken by a suitably experienced ecologist in order to identify any holts or other signs of how otters may be using the site, particularly to determine whether any potential holts are present within the areas of scrub and woodland that lie adjacent to the

watercourses. This survey can be undertaken at any time of year. The results of this survey will then inform any further mitigation or compensation that may be required.

Operational impacts

Once the further survey work has been undertaken, the impacts of the proposed development and required mitigation and compensation measures can be more accurately assessed.

4.2.8 Water vole

No records of water vole were returned from within 2km of the proposed development site. However, the River Clywedog and Redwither Brook which flow along the southern and eastern site boundaries provide broadly suitable habitat for water voles.

Construction impacts

The proposed development could potentially cause direct harm, injury and / or death to individuals. It could also cause disturbance and the direct loss of suitable habitat, as well as indirect habitat degradation through changes in the water quality.

Mitigation

A 10m buffer zone should be retained along the banks of the River Clywedog and the Redwither Brook to protect water voles and their habitat, if present on site.

If a 10m buffer zone cannot be retained along both watercourses, a water vole survey should be undertaken by a suitably experienced ecologist in order to identify any burrows, latrines or other field signs indicating water vole presence. Surveys can be conducted mid-April to mid-September, but the optimal time to carry out surveys is in May and June during the peak breeding season. The results of this survey will then inform any further mitigation or compensation that may be required.

Operational impacts

Once the further survey work has been undertaken, the impacts of the proposed development and required mitigation and compensation measures can be more accurately assessed.

4.2.9 Hedgehogs

No evidence of hedgehog activity was observed on site during the walkover survey. However, numerous records of hedgehogs were returned from the local area and the areas of dense scrub, woodland and grassland on site provide suitable foraging and commuting opportunities for hedgehogs. Additionally, the scrub, woodland and rubble piles present on site provide suitable refugia and hibernating opportunities for hedgehogs.

Construction impacts

Clearance and construction activities without mitigation could result in direct harm, injury and / or death to individuals.

Mitigation

The following RAMs should be implemented on site during the construction phase of the development:

- No trenches or excavations will be left open overnight. They will be backfilled or covered with board, or alternatively fitted with a means of escape for any hedgehogs (or other animal) which may become trapped within, such as a plank or slope leading out of the bottom of the excavation at an angle of 45°. All excavations left open overnight will be checked for trapped wildlife in the morning.

- If any rubble piles or any other potential refugia are present on site or are created as part of the works, they will be removed by hand or checked for sheltering hedgehogs prior to their removal by mechanical means or burning. Potential refugia can also include piles of leaf litter, log piles and brash piles.

- Any pipes will be stored with caps on to prevent entry by hedgehogs and other animals, and materials such as barbed wire will be stored so that animals cannot become entangled in them.

- Any chemicals or harmful materials will be stored so that they cannot be accessed by hedgehogs or other animals.

- Excavations will be checked immediately before they are backfilled to ensure that no animals have become trapped.

Operational impacts

To allow continued use of the site by hedgehog and to ensure commuting routes aren't blocked, fences installed on site that would block access to suitable habitat should be designed to allow passage by hedgehogs. This can either be through the choice of material e.g. choosing a fence style that naturally contains holes at the base or through the inclusion of hedgehog highways. Hedgehog highways are small 13cm x 13cm holes at the base of fences.

4.2.10 Invertebrates

Dingy skipper, grizzled skipper and small heath butterflies are all known to have historically been present on site. The site has reduced in quality over the last 20 years due to a lack of management and scrub encroachment of grasslands has resulted in a reduction of larval food plants and foraging resources for adults. Some suitable habitat still remains on site and all three species may still be present.

Construction impacts

If any butterfly species of principal importance are present, works on site could result in the following impacts: direct harm, injury and / or death to individuals, loss of suitable habitat and fragmentation of habitats.

Mitigation

A butterfly survey targeting dingy skipper, grizzled skipper and small heath butterflies should be undertaken of the site. The survey will determine whether these species are still using the site and if so, what is the population size. The survey should involve several transect surveys across May and June, during the flight period of all three species. The survey should specifically target the remaining areas of grassland, which are the only habitats on site that contain sufficient larval food plants and botanical diversity to support foraging adults.

Compensation and enhancement

The suitability of the site could be significantly increase for all three species through scrub clearance and the creation and long-term management of areas of species-rich grassland.

Operational impacts

No operational impacts are envisaged.

5 CONCLUSION

The land parcel has an area of approximately 23.9ha and comprises a large area dominated by dense scrub. Small areas of semi-improved grassland are present across the site including small glades amongst the scrub and pathways. The River Clywedog flows along the southern site boundary and the Redwither Brook flows along the western boundary. Both watercourses are bordered by a band of riparian woodland. Numerous buildings are present across the site and a number of ponds were known to historically be present, only one of which is now considered to still function as an aquatic habitat. Other habitats present on site include hardstanding access tracks and small areas of marshy grassland, tall ruderal vegetation, bare ground, scattered broadleaved trees and ephemeral / short perennial vegetation.

The preliminary ecological appraisal has highlighted potential issues with the following ecological receptors on or adjacent to site: amphibians, badgers, bats, breeding birds, designated sites, hedgehogs, invasive species, invertebrates, otters, ponds, trees, reptiles, watercourses, water voles and woodland and scrub. Provided these issues are addressed in accordance with the recommendations detailed in this report, the development may proceed without adversely impacting the aforementioned ecological receptors.

The development of part of the site provides an opportunity to secure the long-term management and ecological enhancement of the wider site. Key enhancement measures that would benefit the site include scrub removal, invasive species eradication, pond creation and restoration, and species-rich grassland creation and restoration. The site could also be enhanced though the installation of a suite of bat and bird boxes and the creation of hibernacula for amphibians and small mammals.

6 REFERENCES

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