







Hydro Aluminium

Wrexham Industrial Estate

Preliminary Ecological Appraisal

Prepared For: Portal Construction NW Ltd.

Document Reference: 9871.002

April 2023

Version 3.0

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Project Name:	Hydro, Wrexham Industrial Estate
Location:	Wrexham
Document Title:	Preliminary Ecological Appraisal
Client:	Portal Construction NW Ltd.
Year of Surveys:	2023
Report Prepared:	2023
Prepared by:	The Environment Partnership Ltd
Office:	Warrington
Document Ref:	9871.002

Document history and status:

Version	Date	Description of Issue	Author	Checked	Approved
1.0	2023	First Draft	DL	AE	AE
2.0	2023	Updated following HSI, eDNA & butterfly surveys	DL	LG	LG
3.0	2024	Updates following proposed site	KR	LG	LG

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The content of this document has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct and is compliant with British Standard BS42020:2013 Biodiversity Code of Practice for Planning and Development.

The conclusions and recommendations contained in this document are based upon information gathered by TEP and provided by third parties. Information provided by third parties and referred to herein has not been independently verified by TEP, unless otherwise expressly stated in the document.

Nothing in this report constitutes legal opinion. If legal opinion is required, the advice of a qualified legal professional should be secured.

Contents

Page

1.0 INTRODUCTION 2
Site Location 2
Planning Context 3
Consultation 3
Scope 3
2.0 METHODS 5
Desk Study 5
Habitats and Flora 6
Fauna 7
Ecological Assessment Process 10
Assumptions 11
3.0 RESULTS 12
Planning Context 12
Designated Sites 12
Habitats and Flora 14
Fauna 16
4.0 ASSESSMENT OF POTENTIAL IMPACTS 6
Wildlife Sites 6
Habitats and Flora 6
Fauna 7
5.0 MITIGATION AND ENHANCEMENT 10
Wildlife Sites 10
Habitats and Flora 10
Fauna 11

Figures

Figure 1: Site location 3

Tables

Table 1: Pond Habitat Suitability Index (HSI) Scoring 8
Table 2: Bat Roosting Habitat Categories 10

Appendices

Appendix A: Ecology Desk Study
Appendix B: Target Notes
Appendix C: eDNA results letter 2024 1040068-10204

eDNA results letter 2023 1040055-AD
eDNA results – 9871-P3

Appendix D: Grizzled Skipper Survey by Conops Entomology Ltd

Drawings

G9871.007 Phase 1 Habitat Survey

2027. P. 003 - Proposed Site Plan_draft_23.05.24

Executive Summary

Site Details	The site is located on Bridge Road within the Wrexham Industrial Estate, Wrexham. Grid ref: SJ 37557 49230. The area of the site is approximately 2.35ha.
Proposals	The current proposals include the construction of a new aluminium processing warehouse within the footprint of the existing Hydro Aluminium site.
Designated wildlife sites	■ No designated wildlife sites will be directly impacted by the proposals. ■ The development may result in indirect impacts to River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and River Dee / Afon Dyfrdwy SSSI via increased levels of phosphate. ■ The site is hydrologically connected to Wrexham Industrial Estate LWS, Cefn Park LWS, Peter's Dingle LWS and Marchwiel Marsh LWS and may result in indirect impacts to these locally designated sites via increased levels of pollution into nearby watercourses.
Important Ecological Features present within or adjacent to the site	■ Ancient semi-natural woodland (HPI) is located adjacent to the northern site boundary. ■ Three ponds (P1-P3) with the potential to support breeding great crested newts are present within 250m of the site.
Recommendations	The following recommendations are made to ensure that delivery of the project remains compliant with relevant legislation and policy: ■ A Root Protection Zone (RPZ) should be implemented around retained trees in accordance with BS5837:2012 if development is likely to affect any trees, their roots and overhanging canopies. ■ A Construction and Environmental Management Plan (CEMP) is required to ensure no impacts to the woodland on site and adjacent to the site from run off, dust, and spillages. ■ It is recommended that a buffer zone is applied around the ancient woodland to the north of the site. ■ Replacement native tree planting is recommended to replace those lost from the development. ■ A sensitive lighting plan will be required to avoid adverse impacts to foraging and roosting bats and other crepuscular species. ■ Vegetation clearance works should be completed outside of the bird nesting period (typically taken to be March to August inclusive). ■ An invertebrate-related compensation should be undertaken on low-fertility soils, including butterfly banks and open mosaic swards. ■ Vegetation and potential hibernacula clearance will be undertaken under a Precautionary Working Method Statement (PWMS) to protect amphibians, reptiles, hedgehog and polecat. ■ A walkover of the woodland to the north of the site will be required to check for signs of badger and otter.

This Executive Summary is not a substitute for the full report. Refer to the full text of this report for further detail.

1.0 Introduction

1.1 The Environment Partnership (TEP) was commissioned by Portal Construction NW Ltd. in 2023 to undertake Preliminary Ecological Appraisal (PEA) to inform a planning application for a new aluminium processing warehouse at Hydro Aluminium located in Wrexham Industrial Estate (hereafter referred to as 'the site').

1.2 An Ecological Desk Study has been produced to support this PEA, reported under separate cover (TEP Ref: 9871.001). This PEA report should read in conjunction with the Desk Study.

1.3 This PEA report includes details of the methods employed and any limitations of the surveys undertaken. Results are provided with supporting maps, together with an evaluation of the ecological features within the site, an assessment of the potential impacts associated with the development proposals and requirements for mitigation. The assessment has been undertaken with due consideration for current best practice guidelines (CIEEM 2017a[1], 2018[2]).

Site Location

1.4 The site is located on Bridge Road and bordered by Clywedog Road East within the Wrexham Industrial Estate in the administrative area of Wrexham County Borough Council. The location of the site is depicted by the red line shown in Figure 1. The approximate central grid reference of the site is SJ 37557 49230.

1.5 The immediate area surrounding the site forms part of the Wrexham Industrial Estate and a residential estate lies to the south of Clywedog Road East. The wider landscape comprises agricultural land and Wrexham City is located approximately 2km west of the site. The River Clywedog lies 650m east of the site at its nearest point and Wrexham Road A534 is located approximately 2.5km north.

[1] CIEEM (2017a) Guidelines for Ecological Report Writing, 2nd Edition. Chartered Institute of Ecology & Environmental Management

[2] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester

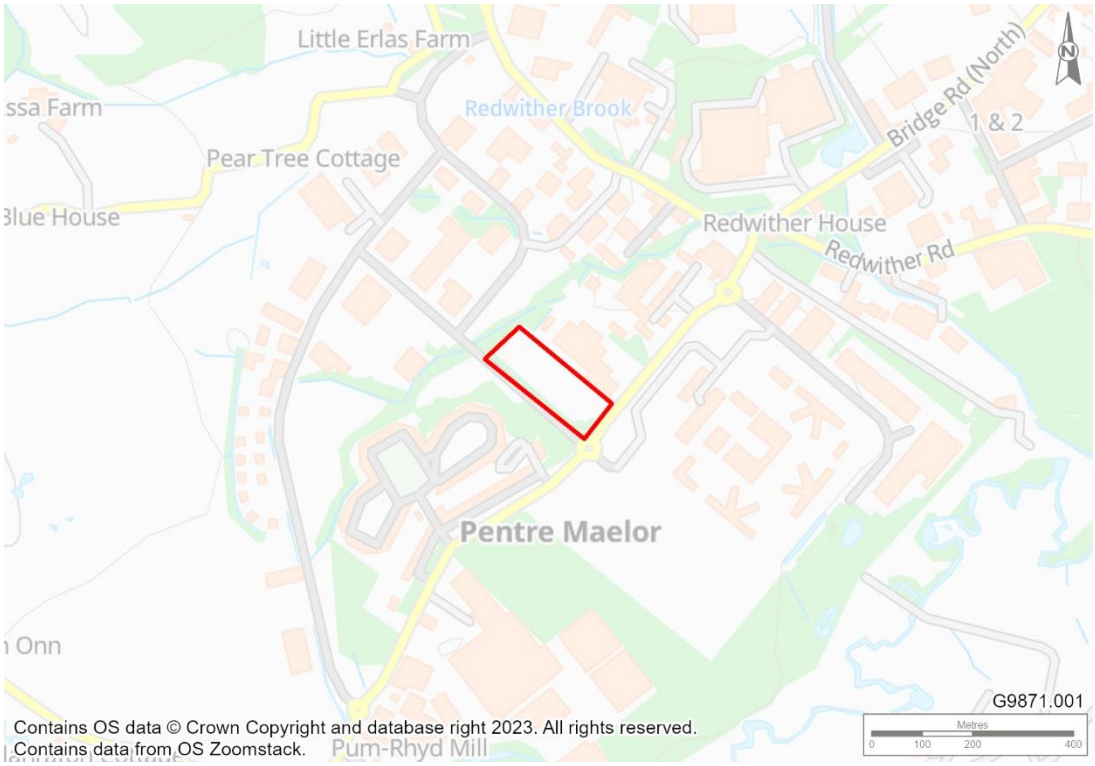


Figure 1: Site location

Planning Context

1.6 Relevant information regarding local planning policy is provided in the Ecological Desk Study (TEP Ref 9871.001).

Consultation

1.7 A pre-application planning enquiry was submitted to Wrexham Country Borough Council by Hydro Aluminium Deeside Ltd and the response was received on 24th August 2022 (ENQ/2022 /0219).

Scope

1.8 This ecological assessment considers potential ecological effects upon any notable habitats or species which may be present or adjacent to the site.

1.9 This report provides baseline information on the habitats and protected species present on site, gathered during a desktop study and Extended Phase 1 habitat survey undertaken in March 2023.

1.10 This report presents the findings of the PEA, the objectives of which are to:

- Detail the methods and results of the aforementioned surveys;
- Identify features of ecological value within the application site such as legally protected species or habitats of importance to biodiversity;

- Identify any non-native invasive species on site and provide advice regarding removal or management;
- Advise on avoidance or mitigation requirements that may be needed prior to development commencing; and
- Provide outline recommendations for biodiversity enhancement within site proposals.

2.0 Methods

Desk Study

2.1 In line with current best practice (CIEEM, 2016[3], 2017b[4]), information regarding designated sites, notable habitats and existing protected and notable species records of the past decade, within a 2km minimum radius of the site was collated and reviewed to inform this ecological assessment. Further detail regarding ecological zones of influence (EZOI) applied for different ecological features and the sources of information included are presented in the Ecological Desk Study (TEP Ref 9871.001).

2.2 In brief, key data sources included Natural Resources Wales (open-source data) and Wrexham County Borough Council Unitary Development Plan and other relevant planning documentation such as Wrexham Biodiversity and Development Local Planning Guidance Note (No.32), Cofnod North Wales Environmental Information Service data, and a review of relevant (within the past ten years) species records.

2.3 Statutory designated wildlife sites were searched for as follows (EZOI applied for each is indicated in brackets):

- Ramsar sites (10km);
- National Sites Network (10km), includes Special Areas of Conservation (SAC) and Special Protection Areas (SPA);
- Site of Special Scientific Interest (SSSI) (5km);
- National Nature Reserve (NNR) (5km); and
- Marine Nature Reserve (MNR) (5km);
- Local Nature Reserves (LNR) (2km).

2.4 Non-statutory designated wildlife sites were searched for within 2km of the site and, within Wales, these may include:

- Wildlife Sites
- Sites of Interest for Nature Conservation (SINC)

2.5 Regionally Important Geological Sites (RIGS) are also identified in the search results provided by Cofnod, but assessment of RIGS and other geological features do not fall within the scope of this PEA and are not discussed further.

2.6 Notable habitats were searched for within 500m of the site. Notable habitats may include those listed under any of the following:

- Ancient woodland;
- Main rivers;

[3] CIEEM (2016) Guidelines for Accessing and Using Biodiversity Data. Chartered Institute of Ecology & Environmental Management

[4] CIEEM (2017b) Guidelines for Preliminary Ecological Appraisal, 2nd Edition. Chartered Institute of Ecology & Environmental Management

- Habitats of principal importance (HPI) as listed by the requirements of Section 7 of the Environment (Wales) Act 2016[5]; and
- Local Biodiversity Action Plan Habitats (LBAP).

2.7 Pre-existing records for notable species were reviewed from the combined data sources, where found from within approximately 2km of the site. Notable species include those listed under any of the following:

- Protected animal species under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (EPS);
- Protected bird species under Schedule 1 of the Wildlife and Countryside Act 1981, as amended (WCA1);
- Protected animal species under Schedule 5 of the Wildlife and Countryside Act 1981, as amended (WCA5);
- Protected plant species under Schedule 8 of the Wildlife and Countryside Act 1981, as amended (WCA8);
- Invasive non-native plant species under Schedule 9 of the Wildlife and Countryside Act 1981, as amended (WCA9);
- Invasive non-native species under the Invasive Alien Species (Enforcement and Permitting) Order 2019 (IAS);
- Species of principal importance (SPI) as listed by the requirements of S7 of Environment (Wales) Act;
- Protection of Badgers Act 1992 (PBA);
- Red and Amber listed Birds of Conservation Concern (BRd/BAm); and
- Wrexham Biodiversity Action Plan Species (LBAP).

Limitations

2.8 Species records can provide a useful indication of the species present within the search area, although the absence of a given species from the dataset cannot be taken to represent actual absence.

Habitats and Flora

Habitat Survey

2.9 An extended Phase 1 habitat survey was completed by Danielle Langton, certified to Level 3 under the Field Identification Skills Certification[6]. The survey was completed on 13th March 2023. The survey was carried out in accordance with the Phase 1 habitat assessment methods (JNCC, 2010[7]) and Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017b[4]). The method records the habitat types present, within the

[5] Section 7 of the Environment (Wales) Act requires Welsh ministers to publish a list of habitats and species which are of principal importance for the conservation of biodiversity in Wales.

[6] A national skills certification scheme operated by Botanical Society of Britain and Ireland. FISC 4 is the competency level recommended for Biodiversity Net Gain (BNG) field assessments

[7] JNCC (2010) Handbook for Phase 1 Habitat Survey – a technique for environmental audit

survey route, based on the JNCC descriptions. Plant species were identified in accordance with the New Flora of the British Isles (Stace, 2019[8]) and recorded as target notes using the DAFOR[9] scale, where relevant.

2.10 The survey was expanded to include off-site habitats adjacent to the site in order to provide context. Adjacent habitats were viewed from accessible locations within the site boundary. Habitats are displayed with the site boundary on Drawing G9871.007.

Limitations

2.11 Any ecological survey represents a snapshot of ecological conditions at the time of survey; ecological conditions may change over time. Efforts to identify dominant plant species for the purposes of characterising broad habitat types do not constitute a detailed botanical survey.

2.12 The survey was undertaken outside of the optimal survey season for Phase 1 habitat surveys (April – October inclusive). There is a small risk that notable/protected or invasive plant species are present within the site but have not been recorded during the survey.

Fauna

2.13 Ordnance Survey maps and aerials were reviewed to identify potentially suitable habitats offsite within influence (e.g. dispersal distances for mobile species) of the site. The Ecological Desk Study identified any pre-existing records for protected and notable species within at least 2km of the site.

2.14 The habitat survey included an extended assessment of the habitats present for their potential to support notable or protected wildlife species, as described at paragraph 2.7. Any signs indicating the presence of these species were recorded.

Amphibians

2.15 There are no ponds present within the application site, however OS maps show that there are two ponds within 500m of the site without any barriers to GCN dispersal. A recently created SUDS pond (P3) is located approximately 120m northeast of the site. The second pond located at 80m northeast on OS maps was found to no longer be present during the HSI and eDNA survey undertaken on 11th May 2023. An additional pond is located approximately 460m northwest of the site, however this pond has been scoped out of the assessment due to the intervening roads and industrial development.

2.16 Two additional offsite ponds (P1 & P2) are not shown on OS maps but were identified during the survey. P1 is a balancing pond located within the wider Hydro Aluminium site, adjacent to the northern boundary of the application site approximately. P2 is a SUDS pond located approximately 70m southeast within the grounds of HMP Berwyn.

[8] Clive Stace (2019) New Flora of the British Isles

[9] DAFOR = Dominant, Abundant, Frequent, Occasional & Rare

Habitat Suitability Index (HSI) Assessment

2.17 A HSI[10] assessment of the balancing pond (P1) to the north of the site was undertaken during the Phase 1 survey on 13th March 2023. HSI of the offsite prison SUDS pond (P2) was undertaken on 21st April 2023. Access to Pond P3 was not available at the time of these surveys and was undertaken on 11th May 2023.

2.18 HSI is a standard measure of calculating the suitability of a water body to support breeding GCN, based on an assessment of ten characteristics (indices), including size, shading, depth and vegetation profile. The assessment generates a number between 0 and 1 for each of the indices which are combined to provide an overall assessment of a water body's suitability to support GCN on a categorical scale (Table 1). The assessment has not been designed for or tested on other water bodies such as ditches.

Table 1: Pond Habitat Suitability Index (HSI) Scoring

HSI Score	Suitability	Predicted GCN Occupancy of Ponds in each Category
< 0.5	Poor	3%
0.5 to 0.59	Below average	20%
0.6 to 0.69	Average	55%
0.7 to 0.79	Good	79%
0.7 to 0.79	Good	79%
> 0.8	Excellent	93%

eDNA

2.19 Environmental DNA (eDNA) sampling was undertaken at P1, P2 and P3 by licensed TEP Ecologist Lee Greenhough.

2.20 Sample kits and analysis were provided by ADAS. Both organisations followed the relevant sections of the method set out in the DEFRA funded study endorsed by Natural England. In summary the sampling protocol is as follows:

- 20 samples were taken from around the entire perimeter of the waterbody.
- The surveyor stayed out of the water while taking the samples (extension poles were used in situations where open/sufficiently deep water was at a distance from the dry banks.
- Survey locations were distributed around the pond perimeter, but micro-siting was used to select locations most likely to be used by GCN.

[10] ARG UK Advice Note 5 (May 2010) Great Crested Newt Habitat Suitability Index

- At each sample location the water column was stirred prior to taking the sample but care was taken to avoid disturbing the sediment on the base of the pond.
- Once all 20 samples were taken, 15ml of the total sample were pipetted into each of the 6 sampling tubes, whilst ensuring that the water in the sample bag was mixed before taking each 15ml sample and that only one sample tube was opened at any one time.
- At all times the surveyor ensured that the risk of contaminating the sampling equipment was minimised by avoiding the placement of the ladle or pipette on the ground or on any otherwise potentially contaminated surfaces and by changing gloves between the initial sampling stage and the pipetting stages of the method.

Limitations

2.21 eDNA samples were taken within the appropriate survey window (15th April to 30th June) and access was possible around the entire pond perimeter. There were no limitations to the survey.

Bats

2.22 A Ground Level Tree Assessment (GLTA) of trees to be impacted within and immediately adjacent to the site was also carried out to determine their suitability to provide bat roost habitat.

2.23 The GLTA involved the surveyor using close focussing binoculars to search from the ground for any Potential Roost Features (PRFs), which may be used by bats. Most tree roosts are created by one or a combination of the following:

- Old woodpecker holes;
- Splits in trunk, bough or large branches;
- Rot holes in trunk, bough or large branches;
- Holes formed by two boughs or branches growing in contact;
- Loose or lifting bark; and
- Underneath a covering of dense latticed creeper, usually ivy *Hedera helix*.

2.24 During the GLTA, physical evidence of use by bats was also searched for, including:

- Live or dead bats;
- Bat droppings;
- Feeding remains (e.g. stripped moth or butterfly wings);
- Urine staining; and
- Fur oil staining.

2.25 Following the GLTA, the trees within the site were categorised in accordance with the criteria for roost habitat assessments identified in the Bat Conservation Trust (BCT)

2016 Good Practice Guidelines (Collins)[11]. Bat roost habitat suitability categorisation details are described in Table 2. Roost habitat suitability categorisation takes into consideration parameters such as location, habitat connectivity, materials, condition and aspect of structures and trees.

Table 2: Bat Roosting Habitat Categories

Roost Category	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only - the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed)
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat

Ecological Assessment Process

2.26 This PEA follows the published guidelines (CIEEM, 2018[2]) and accepted best practice approach (BS42020:2013[12]) of the mitigation hierarchy whereby impacts are first avoided or, where this is not possible, reduced or mitigated or, as a last resort, compensated.

2.27 In summary, the following procedure was undertaken during this PEA:

- Describe the baseline and identify important ecological features;

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

[12] British Standards Institution (2013) BS 42020:2013: Biodiversity — Code of practice for planning and development. BSI Standards Limited, London

- Describe important ecological features and identify those which may potentially be affected by the proposed development;
- Identify potential impacts upon important ecological features and characterise the effect of such impacts (in respect of biophysical changes and taking account of relevant aspects of ecosystem structure or function);
- Incorporate measures to avoid or reduce these effects;
- Determine whether residual ecological effects are considered significant after avoidance or mitigation;
- Identify appropriate compensation measures to offset significant residual effects; and
- Identify opportunities for ecological enhancement.

2.28 Important ecological features are identified and valued, ecological impacts are characterised and assessed, and recommendations for appropriate mitigation, compensation and enhancement are made, in accordance with CIEEM guidance[2].

2.29 BS42020:2013 defines a significant effect as one *"which is important, notable, or of consequence, having regard to its context*". CIEEM describes significance as "*a concept related to the weight that should be attached to effects when decisions are made*". CIEEM defines an ecological effect as significant if it is "*sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project*".

2.30 BS42020:2013 sets out a practical approach to determining the significance of an ecological effect, applicable at all levels of decision making in legal and policy terms, as follows:

- will the effect on biodiversity influence the balance of planning considerations and therefore the decision as to whether planning permission is likely to be refused or granted; and
- if planning permission is granted, is the effect important enough to warrant the use of planning conditions and/or obligations to guarantee proposed measures or to impose restrictions, or to seek further requirements (e.g. for mitigation, compensation, enhancement, monitoring or site management).

2.31 Significance is therefore assessed on a case-specific basis according to the importance of the ecological feature (site, habitat or species) within the conservation hierarchy, and the effect upon it.

Assumptions

2.32 Information provided by third parties, including publicly available information, is assumed to be correct at the time of publication.

3.0 Results

Planning Context

3.1 The Wrexham Unitary Development Plan was adopted by Wrexham County Borough Council on 14th February 2005. Relevant extracts of local planning policy are provided in the Ecological Desk Study (TEP Ref 9871.001).

3.2 The following policies relate to biodiversity and nature conservation:

Wrexham Unitary Development Plan

Strategic Policies

- Policy PS2: Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.
- Policy PS11: Encouragement will be given to proposals which improve the biodiversity value of sites and to the establishment of local nature reserves where the nature conservation and landscape interest of the land will be protected and enhanced.

Specific Policies

- Policy GDP1: Development Objectives
- Policy EC4: Hedgerows, Trees and Woodland
- Policy EC6: Biodiversity Conservation

Local Planning Guidance Notes

- LPGN 17: Trees and Development
- LPGN 29: Employment Development and Nature Conservation
- LPGN 30: Design
- LPGN 32: Biodiversity and Development

Designated Sites

Statutory Wildlife Sites

3.3 Full details regarding designated sites are provided within the Ecological Desk Study (TEP Ref 9871.001) in Appendix A.

3.4 There are four statutory designated sites of international importance within 10km of the site, four of national importance within 5km and four of regional or local importance within 2km. These are:

- River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid Special Area of Conservation (SAC) (Wales);
- River Dee and Bala Lake SAC (England);
- Midland Meres & Mosses Phase 2 Ramsar (Wales);
- Johnstown Newt Sites SAC;

- Afon Dyfrdwy (River Dee) Site of Special Scientific Interest (SSSI);
- Sontley Marsh SSSI;
- River Dee SSSI (England);
- Vicarage Moss SSSI.

3.5 The site falls within a Natural England Impact Risk Zone (IRZ). Although IRZs are applicable in England, they may extend into Wales for sites close to the border.

3.6 The advice states that the local planning authority may need to consult Natural England for a variety of proposals in this zone, as shown in Table 3.

Table 3: Likely Impacts of Development Proposals on SSSIs

Planning Proposal Categories	**Risks to SSSIs**
Infrastructure	Airports, helipads and other aviation proposals.
Air Pollution	Any industrial/agricultural development that could cause AIR POLLUTION (incl: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons & digestate stores > 750m², manure stores > 3500t).
Combustion	General combustion processes >50MW energy input. Incl: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.

Non-Statutory Wildlife Sites

3.7 There are four non-statutory wildlife sites identified within 2km of the site:

- Wrexham Industrial Estate Local Wildlife Site (LWS) – 0.73km north – A series of sites within the industrial estate which includes unmanaged grassland and ancient broadleaved woodland;
- Cefn Park LWS – 0.82km northwest - A series of semi-natural broadleaved woodlands and fen habitats within Cefn Park Estate.
- Peter's Dingle LWS – 1.57km southeast - Semi-natural broadleaved woodland, comprised of ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus* and dog's mercury *Mercurialis perennis*, along a brook.
- Marchwiel Marsh LWS - 1.97km southwest - A marshy grassland dominated by rushes *Juncus sp.*.

3.8 Other non-statutory wildlife sites identified by the Ecological Desk Study (TEP Ref 9871.001) are located at least 2km from the proposed works and have no impact pathways relevant to the site or the proposed nature of the works. Given this, no significant effect would be anticipated to arise upon these other non-statutory wildlife sites (LWS) are therefore scoped out from further assessment.

Other Wildlife Designations / Consultation Zones

3.9 The south-eastern boundary of the site is subject to LDP Policy SP10 Wrexham Industrial Estate Strategic Ecological Network which aims to protect important areas of habitat and maintain connectivity across the wider Industrial Estate.

Habitats and Flora

Pre-existing Data

3.10 The Desk Study identified that an area of Ancient Semi Natural Woodland lies adjacent to the northwest boundary of the site. This habitat is a Habitat of Principal Importance (HPI) for Conservation of Biological Diversity in Wales and is also a LBAP habitat in Wrexham.

3.11 The Desk Study returned no records of protected or notable flora within the site.

3.12 Flora records were returned within 2km of the site as follows:

Protected and notable species

- Native bluebell *Hyacinthoides non-scripta* (WCA8)
- Pennyroyal *Mentha pulegium* (WCA8, SPI)

Non-native invasive species

- Canadian Waterweed *Elodea canadensis* (WCA9)
- Himalayan Balsam *Impatiens glandulifera* (WCA9, IAS)
- Japanese knotweed *Fallopia japonica* (WCA9)
- Montbretia *Crocosmia pottsii x aurea = C. x crocosmiiflora* (WCA9)
- Water fern *Azolla filiculoides* (WCA9)

3.13 Habitats of ecological value present in and around the site are described below and illustrated in Drawing G9871.007. Target notes (TN) are provided in Appendix B.

Woodland, Trees and Scrub

3.14 Plantation broad-leaved woodland (TN1) is present on top of a stepped bund along the western site boundary adjacent to Clywedog Road East. The purpose of the woodland is to provide screening of the site from the nearby residential estate. Species include field maple *Acer campestre*, silver birch *Betula pendula*, hawthorn *Crataegus monogyna*, Scots pine *Pinus sylvestris*, blackthorn *Prunus spinosa* and crack willow *Salix fragilis*. The ground flora is sparse however bramble *Rubus fruticosus,* ivy *Hedera helix* and cleavers *Galium aparine* are abundant in places.

Perennial ryegrass *Lolium perenne*, creeping buttercup *Ranunculus repens*, dandelion *Taraxacum officinale agg.* and nettle *Urtica dioica* are frequent, with occasional cock's-foot *Dactylis glomerata*, willowherb species *Epilobium sp.*, herb-Robert *Geranium robertianum* and hogweed *Heracleum sphondylium*.

3.15 A belt of ancient semi-natural woodland (HPI) is located adjacent to northern site boundary. Access to the ancient woodland was not possible at the time of the survey due to security fencing. Species include sycamore *Acer pseudoplatanus*, hawthorn, ash *Fraxinus excelsior*, Scots pine, pedunculate oak *Quercus robur* and goat willow *Salix caprea*.

3.16 A strip of dense/continuous scrub (TN4) is present along a low bund within the site. Hawthorn and blackthorn are frequent with occasional young pedunculate oak. Bramble is frequent and dense in the places.

3.17 A group of three scattered broad-leaved trees (Himalayan birch *Betula utilis*) are present within amenity grassland in the south of the site, between the southern site boundary and the Leyland cypress *Cupressus* × *leylandii* hedgerow.

Grasslands

3.18 Modified neutral grassland (TN2) is present on top of the bund. Perennial ryegrass and moss sp. are abundant, with frequent red fescue *Festuca Rubra*, hard rush *Juncus inflexus*, creeping cinquefoil *Potentilla reptans*, bramble, broad-leaved dock *Rumex obtusifolius* and willow scrub *Salix sp.*. Occasional species include knapweed *Centaurea nigra*, creeping thistle *Cirsium arvense*, spear thistle *C. vulgare*, willowherb species *Epilobium sp.*, herb-Robert, ivy, bristly oxtongue *Helminthotheca echioides*, hogweed, soft rush Juncus effusus, meadow buttercup and dandelion. Species that are 'rare' in this habitat include yarrow *Achillea millefolium*, daisy *Bellis perennis*, Leyland cypress, ribwort plantain *plantago lanceolata*, common sorrel *Rumex acetosa* and colt's-foot *Tussilago farfara*.

3.19 Small areas of amenity grassland are present in the south of the site, bordering the boundary fence adjacent to Bridge Road. Perennial ryegrass and red fescue are abundant. Dandelion, cock's-foot, white clover *Trifolium repens*, creeping cinquefoil and moss sp. are frequent. Cleavers, ribwort plantain, common mouse-ear *Cerastium fontanum*, daisy are occasional.

Hedgerows

3.20 A single Leyland Cypress hedge (conifer hedge) is present near to the site entrance provides screening of the site from Bridge Road.

Other Habitats

3.21 The lower areas of the stepped bund adjacent to the hardstanding vehicle access route comprise bare ground with ephemeral/short perennial vegetation. This habitat is also present surrounding the dense/continuous scrub on the low bund and in smaller areas around the site. Moss is dominant in these habitats.

3.22 A balancing pond (TN5) is present within the wider Hydro Aluminium site. It is located outside of the development footprint, adjacent to the northern/eastern site boundary. It is a linear pond with dense *Typha sp.* cover and an outflow is present at the northern end. The pond was holding water at the time of the survey, but the water level was low. Anecdotal evidence suggests that the water level fluctuates as a result of industrial discharges however it rarely completely dries.

Notable or Invasive Flora

3.23 No notable or invasive flora were recorded within the site during the Extended Phase 1 habitat survey.

Habitat Connectivity

3.24 The plantation broad-leaved woodland within the site provides connectivity through Wrexham Industrial Estate and to the wider landscape via the ancient woodland corridor and brook north of the site.

Fauna

Amphibians

3.25 There are no records of amphibians within the application site or within the wider Hydro Aluminium site.

3.26 The Desk Study returned records for the following amphibian species within 2km of the site:

- Great crested newt GCN *Tritaurus cristatus* (EPS, SPI, WCA5, LBAP)
- Common toad *Bufo bufo* (SPI, WCA5 9.5a)

3.27 The closest records of GCN and common toad are approximately 0.3km south of the site, within the grounds of HMP Berwyn.

3.28 There are no waterbodies present within the application site and therefore there is no suitable breeding habitat for amphibians. The nearest waterbody with suitability for breeding amphibians including GCN is located within the wider Hydro Aluminium site, adjacent to the application site boundary. Habitat Suitability Index assessment (HSI) of P1 concluded that the pond has 'Excellent' suitability (0.81) to support breeding GCN.

3.29 Two further ponds are located within 250m of the site without any barriers to GCN dispersal. A SUDS pond (P2) is located to the south of the site within the grounds of the prison, approximately 70m southeast of the application site beyond Bridge Road Bridge Road is not considered to act as a barrier to GCN dispersal between the SUDS pond and the site as there are multiple dropped kerbs.

Habitat Suitability Index (HSI) Assessment

3.30 P2 was holding water at the time of the survey (March 13th) however a full HSI assessment was unable to be carried out at that time due to a lack of agreed access.

A full HSI assessment of this pond was subsequently undertaken on 21st April 2023 and P2 was assessed to have 'Good' suitability (0.75) to support breeding GCN.

3.31 P3 is located 120m northeast of the site. A full HSI assessment of this pond was undertaken on 11th May 2023 and the pond was assessment to have 'Average' suitability (0.66) to support breeding GCN.



Figure 2: Balancing Pond (P1)



Figure 2: SUDS Pond south of site (P2)



Figure 3: SUDs Pond north of site (P3)

Table 4: Habitat Suitability Index Assessment of ponds P1-P3

SL Ref	Description of Index	P1		P2		P3	
		Measure/ Comment	**SI Score**	**Measure/ Comment**	**SI Score**	**Measure/ Comment**	**SI Score**
SI1	Geographic location	A	1	A	1	A	1
SI2	Pond Area m2	140	0.3	85	0.2	107	0.2
SI3	Pond permanence	Rarely dries	1	Sometimes dries	0.5	Rarely dries	1
SI4	Water quality	Moderate	0.67	Good	1	Poor	0.33
SI5	Shading %	60	1	0	1	0	1
SI6	Presence of waterfowl	Absent	1	Absent	1	Absent	1
SI7	Presence of fish	Absent	1	Absent	1	Absent	1
SI8	Pond density in area	13+	0.975	13+	0.975	13+	0.975
SI9	Terrestrial habitat quality	Moderate	0.67	Moderate	0.67	Moderate	0.67
SI10	Macrophyte cover in pond	90%	0.9	50%	0.8	5%	0.4
HSI	Overall HSI for pond	**Excellent**	**0.81**	**Good**	**0.75**	**Average**	**0.66**

Limitations

3.32 The HSI assessment of P1 was undertaken outside of the optimal season for assessing shade, macrophyte cover and presence of waterfowl, therefore these indices may have been underestimated at the time of the survey.

eDNA survey

3.33 eDNA surveys of Ponds P1 & P2 were undertaken on 21st April 2023 and eDNA of P3 was undertaken on 11th May 2023. A negative result was returned for all three ponds.

Terrestrial Habitats

3.34 Habitats within the site including plantation broad-leaved woodland, dense/continuous scrub and earth banks with ephemeral/perennial vegetation offer suitable terrestrial habitat for amphibians. The plantation broad-leaved woodland within the site and Ancient semi-natural woodland north of the site form part of a GCN habitat network throughout Wrexham Industrial Estate.

Badger

3.35 There are no records of badger *Meles meles* (PBA, LBAP) within the application site or wider Hydro Aluminium site within the last ten years

3.36 [redacted] Precise locations have not been included within this report due to the confidential nature of badger records[redacted]

3.37 The habitats within the site offer suitable foraging and ranging habitat for badgers. The plantation broadleaved woodland, dense/continuous scrub and earth banks within the site and the ancient semi-natural woodland adjacent to the site offer suitable habitat for sett creation.

3.38 No evidence of badger was recorded within the site or adjacent to the site during the Phase 1 habitat survey. The woodland adjacent to the northern site boundary was not accessible at the time of the Phase 1 habitat survey however a walkover of this area was undertaken on 11th May 2023 and no signs of badger were observed.

Bats

3.39 There are no records of bats within the application site or wider Hydro Aluminium site.

3.40 The Desk Study returned records of the following bat within 2km of the site:

- Brandt's bat *Myotis brandtii* (EPS, WCA5)
- Brown long-eared bat *Plecotus auratus* (EPS, SPI, WCA5, LBAP)
- Common pipistrelle *Pipistrellus pipistrellus* (EPS. WCA5)
- Daubenton's bat *Myotis daubentonii* (EPS, WCA5)
- Myotis species *Myotis sp.* (EPS, SPI, WCA5)
- Noctule *Nyctalus noctula* (EPS, SPI, WCA5, LBAP)

- Soprano pipistrelle *Pipistrellus pigmaeus* (EPS, WCA5, SPI)

3.41 There are no buildings within the site. The existing warehouse buildings to the north of the application site have been assessed as having negligible suitability to support roosting bats as they are constructed of metal.

3.42 There are no trees with suitability for roosting bats within the site. All trees were assessed as negligible suitability for roosting bats as they are relatively young and lack suitable potential roosting features (PRFs). The ancient semi-natural woodland north of the site may offer suitable roosting habitat for bats.

3.43 The plantation woodland and dense/continuous scrub within the site and the ancient semi-natural woodland north of the site offer suitable commuting and foraging habitat for bats and there is good connectivity to suitable habitats within the wider landscape.

Birds

3.44 The Desk Study returned numerous records for protected and notable bird species within 2km of the site, including the following Schedule 1 (WCA1) species:

- Barn owl *Tyto alba* (LBAP)
- Cetti's warbler *Cettia cetti*
- Crossbill *Loxia curvirostra*
- Fieldfare *Turdus pilaris* (BRd)
- Goshawk Accipiter gentilis
- Hobby *Falco subbuteo*
- Kingfisher *Alcedo atthis*
- Little ringed plover *Charadrius dubius*
- Peregrine *Falco peregrinus*
- Redwing *Turdus iliacus*

3.45 The plantation broad-leaved woodland, dense/continuous scrub and hedgerow offer suitable foraging and nesting habitat for a range of common bird species. The ephemeral/perennial vegetation and amenity grassland offer additional foraging habitat but are unlikely to support ground nesting birds due to disturbance from workers and passing vehicles. The ancient semi-natural woodland to the north of the site has the potential to support a wider range of foraging and nesting birds, including protected and notable species.

Hazel dormice

3.46 The Desk Study returned no records of dormice within 2km of the site. While the site contains potentially suitable habitats, the site is isolated with limited connectivity in the wider landscape with capacity for supporting hazel dormouse. Hence, hazel dormice are not discussed any further within this report.

Invertebrates

3.47 There are no records of notable invertebrates within the application site or wider Hydro Aluminium site.

3.48 The Desk Study returned records of the following invertebrate species within 2km of the site:

- Blood-vein *Timandra comae* (SPI)
- Cinnabar *Tyria jacobaeae* (SPI)
- Dingy skipper *Erynnis tages* (SPI)
- Grizzled skipper *Pyrgus malvae* (SPI)
- Latticed heath *Chiasmia clathrate* (SPI)
- Shaded broad-bar *Scotopteryx chenopodiata* (SPI)
- Small heath *Coenonympha pamphilus* (SPI)

3.49 The plantation broad-leaved woodland, dense/continuous scrub and ephemeral/short perennial habitats within the site provide suitability for a range of common and notable invertebrate species. The amenity grassland and bare ground offer suboptimal habitat for invertebrates.

3.50 The ephemeral/perennial vegetation within the site offer suitability for dingy skipper and grizzled skipper butterflies. These species have been recorded within the grounds of HMP Berwyn, approximately 0.3km south of the site.

Reptiles

3.51 There are no records of reptiles within the application site or wider Hydro Aluminium site.

3.52 The Desk Study returned records of the following reptile species within 2km of the site:

- Common lizard *Zootoca vivipara* (WCA5, SPI)
- Grass snake *Natrix helvetica* (WCA5, SPI)

3.53 The closest records of common lizard and grass snake are 1.4km and 0.7km northeast, respectively.

3.54 The plantation broad-leaved woodland and dense/continuous scrub offer suitable sheltering habitat for reptiles and the ephemeral/perennial, bare ground and hardstanding offer suitable basking habitat. There is good connectivity to suitable reptile habitats in the wider landscape via the woodland corridor north of the site.

3.55 Pond P1 and the brook to the north to the site offer suitable foraging habitat for grass snake. The ephemeral/perennial vegetation provides suitable foraging habitat for common lizard.

Otter

3.56 The Desk Study returned three records of otter *Lutra lutra* (EPS, WCA5, SPI, LBAP) within 2km of the site and the closest record is approximately 0.7km northeast in Redwither Brook.

3.57 Otter require riparian habitats for foraging and commuting with wetlands in close proximity for shelter. The nearest watercourse is located approximately 30m north of the site, within ancient semi-natural woodland. This watercourse and ancient woodland have not been assessed for their suitability to support otter due to a lack of permitted access.

3.58 The plantation broad-leaved woodland within the site offers limited suitable terrestrial habitat for otter and no signs of otter were observed during the Extended Phase 1 habitat survey.

Water vole

The Desk Study returned no records of water vole *Arvicola amphibius* (WCA5, SP1) within 2km of the site.

There are no suitable habitats within or within close proximity to the site that have the potential to support water vole. The balancing pond (P1) within the Hydro Aluminium site is not considered to provide suitable habitat for water vole due to the low water level, shallow banks and lack of connectivity to suitable habitat within the wider area.

The nearest watercourse is approximately 30m north of the site and no direct impacts are anticipated under the current proposals. The existing boundary fencing provides a suitable buffer from the watercourse, hence water vole are not discussed any further within this report.

Other Relevant Species

Hedgehog

3.59 The Desk Study returned three records of hedgehog *Erinaceus europaeus* (SPI) within 2km of the site. The closest record is approximately 0.4km northeast of the site.

3.60 The plantation broad-leaved woodland and dense/continuous scrub within the site offer potential sheltering and hibernating habitat for hedgehog and the amenity grassland and ephemeral/perennial vegetation offer suitable ranging and foraging habitat.

Polecat

3.61 The Desk Study returned two records of polecat *Mustela putorius* (SPI) within 2km of the site. The closest record is approximately 1.7km northeast of the site.

3.62 The plantation broad-leaved woodland provides potential habitat for foraging and sheltering polecat, although more suitable habitat is present to the north of the site

i.e., ancient semi-natural woodland and watercourse. There is connectivity to suitable habitat for polecat via the woodland corridor to the north of the site.

4.0 Assessment of Potential Impacts

4.1 This section assesses the potential impacts on ecological features associated with the proposed development shown in the Recycling Centre Deeside V9 drawing provided by the client. However, the site layout has not yet been finalised and it is expected that the final site layout will be revised as a result of the recommendations provided in this report and the AIA.

4.2 Consideration is given to the 'mitigation hierarchy', i.e. that impacts are first avoided or where this is not practicable, mitigated and as a final resort, compensated (off-set).

Wildlife Sites

Statutory Designated Sites

4.3 The pre-application enquiry response from Wrexham County Borough Council states that the proposed development has the potential to result in increased phosphate discharges into the River Dee (SAC/SSSI) as a result of increased foul water to Five Fords wastewater treatment works via mains drains.

4.4 No direct impacts to any other statutory designated sites are anticipated as a result of the proposed development given the intervening distance between the site and any designated sites and relatively small footprint of the development. However, the site is hydrologically connected to the River Dee SAC/SSSI via the brook to the north of the site, which leads into Reedwither Brook, the River Clywedog and the River Dee. In the absence of mitigation, indirect impacts to River Dee SAC/SSSI may occur as a result of increased levels of pollution into the brook.

Non-statutory Designated Sites

4.5 The closest non-statutory designed sites are Wrexham Industrial Estate LWS and Cefn Park LWS, located 0.7km north and 0.8km respectively. Given that the majority of the development footprint comprises hardstanding and bare ground, in addition to the intervening industrial habitat no direct impacts to non-statutory sites are expected. However, the site is hydrologically connected to Wrexham Industrial Estate LWS, Cefn Park LWS, Peter's Dingle LWS and Marchwiel Marsh LWS via the brook to the north of the site which leads into Redwither Brook and the River Clywedog. In the absence of mitigation, indirect impacts to these LWSs may occur as a result of increased levels of pollution into the brook.

Habitats and Flora

Notable Habitats

4.6 There are no notable habitats present within the site, however ancient semi-natural woodland lies adjacent to the northern site boundary.

4.7 The Arboriculture Impact Assessment (TEP Ref: 9871.001) recommends that a buffer zone should be maintained between the development and the ancient woodland to

prevent any direct or indirect impacts to this habitat as a result of the development. However, a buffer zone has not been applied during previous works on site and hardstanding has been constructed immediately adjacent to the ancient woodland. The existence of hardstanding immediately adjacent to this habitat suggests that further construction activities within the buffer zone should not result in any significant negative impacts to the ancient woodland.

4.8 Nevertheless, in the absence of mitigation the proposed development may directly or indirectly impact the adjacent woodland habitat through accidental damage, water and nutrient runoff, dust pollution and light spill.

Fauna

Amphibians

4.9 Under the current proposals, the earth banks with dense/continuous scrub and ephemeral/short perennial vegetation will be cleared to facilitate the development. These habitats have the potential to support ranging, foraging and sheltering amphibians. The plantation broad-leaved woodland also offers suitable sheltering habitat for amphibians however no direct impacts are anticipated to this habitat.

4.10 Due to the proximity of suitable breeding habitat for amphibians, there is potential for harm to occur to amphibians during site clearance works.

Badger

4.11 The plantation broad-leaved woodland and earth banks within the site offer suitable habitat for sett creation, however no signs of badger were observed during the survey. Habitats of greater suitability for badger are present within the wider landscape, particularly within the woodland corridor immediately to the north of the site. We accessed and no evidence of badger activity was recorded within this wood.

4.12 Loss of scrub, earth bank and ephemeral/perennial habitat within the site is unlikely to have a significant impact on any local badger populations. However, badgers may range into the site and there is the potential for harm to occur to badgers during site clearance and construction activities.

Bats

4.13 The plantation broad-leaved woodland within the site offers suitable foraging and commuting habitat for bats and provides connectivity to the wider landscape. There is no suitable bat roosting habitat present within the site. Under the current proposals, the plantation broad-leaved woodland will not be directly impacted by the development and therefore no direct impacts to foraging and commuting bats are expected.

4.14 The ancient woodland adjacent to the northern site boundary may offer suitable bat roosting habitat, however no direct impacts to this habitat are anticipated.

4.15 The dense/continuous scrub and hedgerow offers limited foraging habitat for bats and loss of these habitats are unlikely to impact local populations of bats and will not result in habitat fragmentation. Replacement scrub and tree planting within the site will provide enhanced foraging and commuting opportunities for bats.

4.16 There is the potential for indirect impacts to roosting, foraging and commuting bats during site construction and operation from increased lighting levels and light spill onto potential roosting habitat.

Birds

4.17 Under the current proposals, suitable bird nesting and foraging habitats will be cleared to facilitate construction of the warehouse. No direct impacts to the plantation broad-leaved woodland within the site are anticipated.

4.18 There is a risk of damage or destroying a nest if vegetation clearance is carried out in the nesting period (generally considered to be between March to August inclusive, although geographical position of the site will influence this period and some species nest also commonly nest outside this period).

4.19 Although there will be temporary disturbance to birds during site clearance and construction activities, loss of these habitats is unlikely to have a significant impact on the local bird assemblage.

Invertebrates

4.20 The site provides suitable breeding, foraging and sheltering habitat for a range of terrestrial invertebrate species, particularly dingy and grizzled skipper butterflies. The bare ground and ephemeral/short perennial habitats may support these species and under the current proposals these habitats will be lost to facilitate the development. Hence, loss of this habitat within the site may adversely affect local populations of dingy and grizzled skipper, if present within the site.

Otter

4.21 A brook lies approximately 30m north of the northern site boundary and the ancient woodland adjacent to the site may offer suitable terrestrial habitat for otter. The site itself offers limited terrestrial habitat for otter and no evidence of otter was observed within the site during the Extended Phase 1 habitat survey. We accessed the watercourse to confirm its suitability for otter and no evidence was noted, It is also worth noted the high levels of disturbance from the warehouse at the rear of the site from members of the public and delivery vehicles.

4.22 The woodland and scrub habitats within and adjacent to the site and the spoil pile offer suitable sheltering and foraging habitat for reptiles. The ephemeral, bare ground and hardstanding habitats offer some suitability for basking and foraging reptiles. Furthermore, the balancing pond adjacent to the site and the brook to the north offer potential foraging habitat for grass snake.

4.23 Given that the current proposals require clearance of scrub and a large section of bund, there is a risk of harming reptiles during site clearance.

Hedgehog and Polecat

4.24 The woodland and scrub habitats both within and adjacent to the site are suitable for sheltering, commuting and foraging hedgehog and polecat. The grassland and ephemeral/short perennial habitats offer additional ranging and foraging habitat and the woodland, scrub and hedgerow offer hibernating habitat for hedgehog.

4.25 Under the current proposals, the woodland within the site will be retained. Loss of other habitats within the site is unlikely to impact local populations of hedgehog or polecat.

4.26 Due to the relatively small area of the scrub present within the site there is considered to be a low risk of encountering hedgehog and polecat during site clearance works. Nevertheless, site works have the potential to cause harm to these species, if present, and a precautionary approach is recommended.

5.0 Mitigation and Enhancement

5.1 This section describes appropriate and proportionate measures for impact avoidance, mitigation and enhancement required or recommended to address the potential ecological effects described in Section 4.0.

Wildlife Sites

5.2 Consultation with NRW is required with regard to potential impacts to River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid SAC and River Dee / Afon Dyfrdwy SSSI as a result of increased phosphate levels from foul water via mains drains.

5.3 Measures to protect nearby non-statutory designated sites and adjacent woodland and watercourses should include the production of a Construction Environmental Management Plan (CEMP) prior to the commencement of the construction stage.

Construction Environment Management Plan

5.4 The CEMP should include measures applicable to all construction activities, including:

- Demarcation of the working areas (including storage areas and accesses), using appropriate fencing, to protect retained habitats and features; and
- Clearance of scrub, grassland and other habitats to take place under supervision and at the appropriate time of year, as appropriate to the species in question.

5.5 The CEMP should also detail the environmental controls, protection measures and safety procedures that will be adopted during construction to prevent site run-off and potential pollution events. Windblown dust should be minimised by using wheel washing and damping down, while use of net fencing will catch windblown rubbish. To address the risk of singular accidental events, mitigation measures should include provision of spill kits and emergency procedures. Pollution prevention measures should also include minimising air pollution from plant emissions, including turning off engines when not in use.

Habitats and Flora

5.6 Ancient woodland (HPI, LBAP) is present adjacent to the northern site boundary. The plantation broad-leaved woodland within the site is subject to LDP Policy SP10 regarding Wrexham Industrial Estate Strategic Ecological Network.

5.7 Woodland and trees should be protected from accidental damage during site clearance and construction, in accordance with BS5837:2012 Trees in relation to design, demolition and construction. If feasible, it is recommended that buffer zone is put in place around existing woodland within and adjacent to the site to ensure that there are no impacts to these habitats during site clearance or construction works. If a buffer zone cannot be secured by design of the new aluminium processing warehouse, further impact assessment on adjacent woodland will be required.

5.8 Policy LPGN20 advises that the area of mitigation/compensation must be equivalent to the area of land that is being developed, i.e., a minimum of 50% must be left

undeveloped and retained in perpetuity for habitat management. This requirement was also confirmed in the Planning Enquiry Response received by Wrexham County Borough Council in August 2022 (ENQ/2022 /0219).

5.9 Under the current proposals, significantly less than 50% of the application site will be undeveloped and retained for biodiversity purposes. It is recommended that this is taken into consideration during the design process, however if this is unachievable it is understood that offsite habitat mitigation/compensation may be an option.

5.10 The following mitigation and enhancement measures are recommended:

- Maintain a 15m stand off from ancient woodland habitat and replace hardstanding with native scrub within the buffer zone.
- Replacement planting of native trees and scrub to compensate for loss of scrub.
- Management of the plantation woodland to include thinning and removal of failed specimens to allow a more diverse ground flora to establish.
- Enhancement of amenity grassland to a more species-rich grassland to compensate for the loss of modified neutral grassland within the site.
- Retention/creation of bare ground and ephemeral/perennial habitats.

Fauna

5.11 The following standard precautionary working methods should be implemented during site clearance and construction phases:

- Night-time working will be avoided if possible, including within the hour before dusk and an hour after dawn.
- A Sensitive Lighting Strategy for the site will be implemented, to avoid lighting of any potential foraging and/or commuting routes for wildlife and ensure potential impacts on small mammals are reduced.
- Excavations will be boarded or otherwise suitably covered at night. Where this is not practicable, a ramp will be provided (at an angle of no more than 45°) to allow any animal that may become trapped to escape.
- Pipes stored on site would be capped or if caps are not available, stored vertically to prevent entrapment.
- Any chemicals or pollutants used or created by the development must be stored and disposed of correctly according to COSHH regulations.

Amphibians

5.12 Common toad are SPI.

Avoidance and Mitigation Required

5.13 As the eDNA analysis returned a negative result for GCN in ponds P1-P3, works can continue under a Precautionary Working Method Statement (PWMS) including staged vegetation clearance measures and checks of potential refugia. This will ensure no harm to amphibian species during construction works. The PWMS should be appended to the CEMP.

Additional Measures or Enhancement Recommended

5.14 Replacement scrub planting and the provision of brash, log or rock piles will provide habitat for sheltering and hibernating amphibians, as well as invertebrates, hedgehogs and other small mammals.

Badger

5.15 Badgers are protected under the Protection of Badgers Act 1992 from killing, injury and certain acts of cruelty. Their setts are also protected from damage, obstruction or destruction.

Avoidance and Mitigation Required

5.16 If the proposed development is not completed within 12 months of this assessment, an updated badger survey will be required prior to the commencement of works to ensure that badgers have not moved into the site during the intervening period.

Bats

5.17 All British bats are European protected species, afforded full protection under the Habitats Regulations and the Wildlife & Countryside Act 1981 (as amended). Bats are protected from killing or injury, and from disturbance at the place of rest. Bat roosts are also protected from obstruction, damage or destruction (whether or not a bat is in occupation at the time).

Avoidance and Mitigation Required

5.18 The scheme should avoid any increase in lighting levels and minimise light spill by adopting sensitive lighting design, including the following principals:

- Avoid lighting on key habitat and important features e.g. trees with suitability for roosting bats and potential commuting habitat (woodland to west and north) by directing lighting to spill within the site.
- Narrow spectrum bulbs will be used, that do not emit UV light e.g. warm white spectrum lights (<2700Kelvin) or LED luminaires.
- Downward directional luminaires will be used to retain darkness above and using only luminaires with an upward light ratio of 0% and with good optical control.
- Any external security lighting should be set on motion-sensors and short (1min) timers.

- Artificial lighting may be required during construction, for example, where working hours extend beyond daylight hours. Lighting will only be used where and when necessary and should be appropriate, i.e. at levels that are visible and serve the intended function but that do not light excessive areas or provide light at times beyond the functional requirement.

5.19 New lighting should be designed in line with the Institution of Lighting Professionals Guidance Note 08/18 Bats and Artificial Lighting in the UK. It is recommended that an ecologist is consulted when designing the lighting scheme.

Additional Measures or Enhancement Recommended

5.20 Roosting habitat for bats can be enhanced within the wider site with the provision of bat boxes mounted onto existing mature trees or suitable buildings.

Birds

5.21 Native nesting birds, their nests and eggs are protected under the Wildlife & Countryside Act 1981 (as amended) from damage and destruction, from the time of nest construction to fledging of the young.

Avoidance and Mitigation Required

5.22 Works should be completed outside of the nesting period (typically taken to be March to August inclusive). Where avoidance of the nesting period is not practicable, a nesting bird check must be carried out by an ecologist no more than 24 hours prior to the works, to confirm that no active nests are present. In the event that an active nest is identified, works within the surrounding area must halt until the chicks have fledged. The required radius of the exclusion area will depend on the species found nesting and the context of the nesting location.

Additional Measures or Enhancement Recommended

5.23 In addition to replacement scrub planting, nesting habitat for birds can be further enhanced within the wider site with the provision of a variety of bird boxes mounted onto existing mature trees within woodland in the west of the site or on new/existing buildings within the wider Hydro Aluminium site.

Invertebrates

5.24 Dingy skipper and grizzled skipper are Section 7 Species of Principal Importance.

Avoidance and Mitigation Required

5.25 A minimum of two butterfly surveys was carried out on the 17th and 30th May 2023, during the optimum period for surveying dingy and grizzled skipper to determine their presence within the site. Following the completion of the butterfly surveys, low numbers of dingy skipper were noted, indication small meta-poulations.

Additional Measures or Enhancement Recommended

5.26 There are noted within the Grizzled Skipper Survey by Conops Entomology Ltd in Appendix D.

Otter

5.27 Otters and their habitats are protected under the Habitats Regulations and the Wildlife & Countryside Act 1981 (as amended). The otter is also a SPI.

Avoidance and Mitigation Required

5.28 A pre-commencement check for otter should be completed

Additional Measures or Enhancement Recommended

5.29 No additional measures or enhancement is recommended for otter.

Reptiles

5.30 Common lizard, slow-worm, grass snake and adder are protected under the Wildlife and Countryside Act 1981 (as amended) from killing and injury and are all SPI.

Avoidance and Mitigation Required

5.31 A pre-construction check for reptiles is required by a suitably experienced ecologist prior to vegetation clearance. Vegetation clearance will also need to be carried out under a Precautionary Working Method Statement (PWMS) including staged vegetation clearance measures and checks of potential refugia. This will ensure no harm to reptile species during construction works. The PWMS should be appended to the CEMP.

Additional Measures or Enhancement Recommended

5.32 The provision of brash, log or rock piles placed in south-facing and sunny areas near to dense vegetation will provide habitat for sheltering and hibernating reptiles, as well as amphibians, invertebrates, hedgehogs and other small mammals. Corrugated iron sheets and roofing felt placed over bare ground or short vegetation can also provide basking and sheltering habitat for reptiles.

Hedgehog and Polecat

5.33 Both hedgehog and polecat are Section 7 Species of Principal Importance and polecat are additionally protected under Schedule 6 of the Wildlife and Countryside Act which prohibits killing by certain methods.

Avoidance and Mitigation Required

5.34 Implementation of a Precautionary Working Method Statement (PWMS) including staged vegetation clearance measures and checking of potential refugia will ensure

no harm to hedgehog, polecat or other small mammals, if present during site clearance works.

Additional Measures or Enhancement Recommended

5.35 The provision of hedgehog houses and hibernacula is recommended to provide shelter, nesting and hibernation opportunities for hedgehog and other small mammals. These should be places in a sheltered location near to woodland and scrub or within the woodland itself.

5.36 Use of rodenticides should be avoided or limited to prevent death or sub-lethal effects to polecat.

Appendix A

Ecology Desk Study

THE ENVIRONMENT PARTNERSHIP









Hydro Aluminium

Wrexham Industrial Estate

Ecological Desk Study

Prepared For: Portal Construction NW Ltd

Document Reference: 9871.001

April 2023

Version 1.0

Project Name:	Hydro Aluminium, Wrexham Industrial Estate
Location:	Wrexham
Document Title:	Ecological Desk Study
Client:	Portal Construction NW Ltd
Year of Surveys:	2023
Report Prepared:	April 2023
Prepared by:	The Environment Partnership Ltd
Office:	Warrington
Document Ref:	9871.001

Document history and status:

Version	Date	Description of Issue	Author	Checked	Approved
1.0	Apr 2023	Original	PP	SR	LG
2.0	May 2024	Updates	KR	LG	LG

The Environment Partnership Ltd is a private limited company registered in England. Registered number 7745159. Registered office: 401 Faraday Street, Birchwood Park, Warrington, WA3 6GA.

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The content of this document has been prepared in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Code of Professional Conduct and is compliant with British Standard BS42020:2013 Biodiversity Code of Practice for Planning and Development.

The conclusions and recommendations contained in this document are based upon information gathered by TEP and provided by third parties. Information provided by third parties and referred to herein has not been independently verified by TEP, unless otherwise expressly stated in the document.

Nothing in this report constitutes legal opinion. If legal opinion is required, the advice of a qualified legal professional should be secured.

Contents

Page

1.0 INTRODUCTION 1
Site Location 1
Context 1
2.0 METHODS 2
Scope and Data Sources 2
3.0 LEGISLATION AND POLICY 4
Relevant Legislation 4
Relevant Policy 9
Local Planning Policy 10
4.0 WILDLIFE SITES 13
Statutory Sites 13
Non-Statutory Wildlife Sites 19
5.0 NOTABLE HABITATS 21
Habitats of Principal Importance (HPI) 21
6.0 PROTECTED AND NOTABLE SPECIES 23
Pre-existing Species Records 23

Figures

Figure 1: Site location 1
Figure 2: Statutory wildlife sites of international significance within 10km of the site 15
Figure 3: Statutory wildlife sites of national significance within 5km of the site 16
Figure 4: Statutory wildlife sites of regional/local significance within 2km of the site 18
Figure 5: Non-statutory wildlife sites within 2km of the site (map provided by Cofnod) 20
Figure 6: Notable habitats 22

Tables

Table 1: Scope and preliminary ecological Zones of Influence (ZOI) 2
Table 2: Statutory wildlife sites 13
Table 3: Non-statutory local wildlife sites within 2km of the site 19
Table 4: Summary of pre-existing species records returned by Cofnod 23

1.0 Introduction

1.1 The Environment Partnership (TEP) was commissioned by Portal Construction NW Ltd in February 2023, to complete an Ecological Desk Study to inform and support an EIA Screening Opinion for land known as Hydro Aluminium located in Wrexham Industrial Estate (hereafter referred to as 'the site').

Site Location

1.2 The location of the site is illustrated in Figure 1. The approximate central grid reference of the site is SJ 37557 49230.

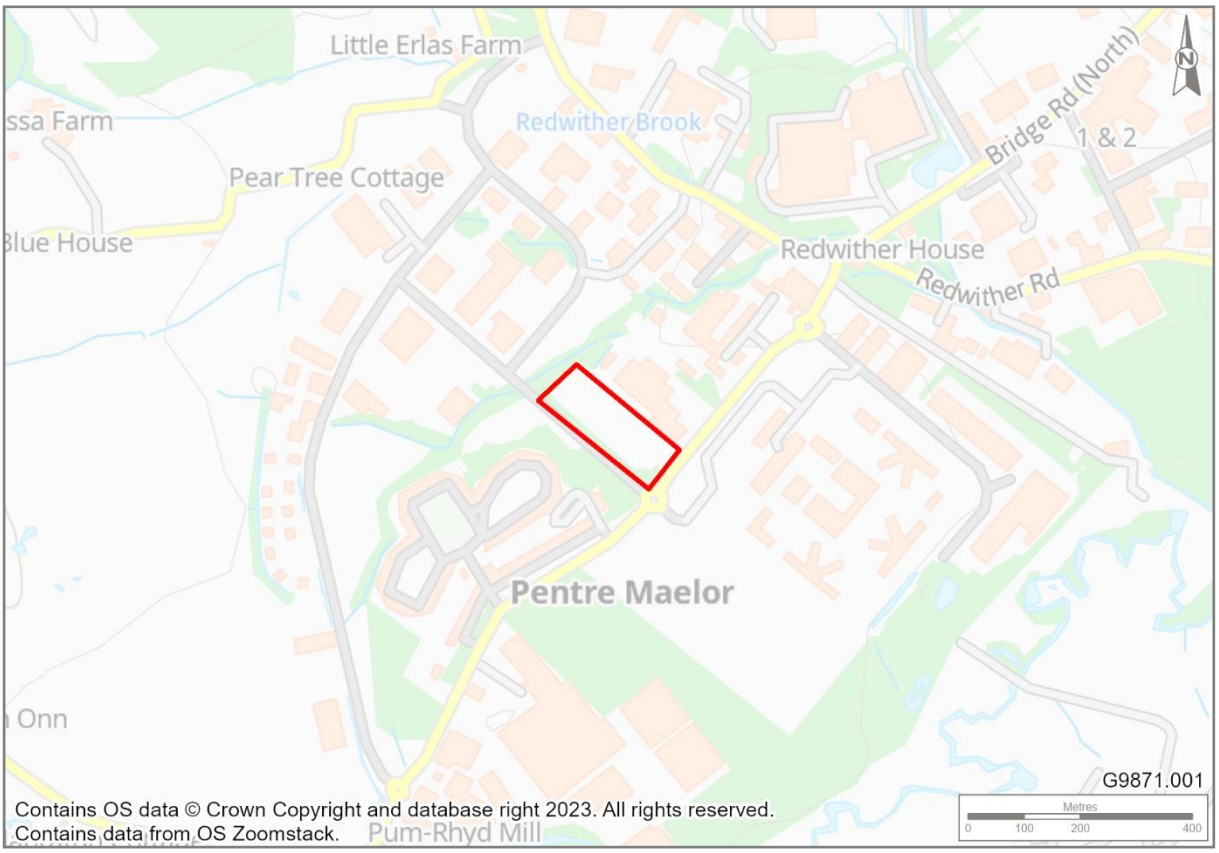


Figure 1: Site location

Context

1.3 The site is located within the administrative area of Wrexham County Borough Council. It is designated as the Clywedog Road East site within Wrexham Industrial Estate, which is allocated for Employment by Policy E1 in the Wrexham Unitary Development Plan (adopted February 2005).

2.0 Methods

Scope and Data Sources

2.1 The ecological Zone of Influence (ZOI) is an area defined by the ecological assessment within which valued ecological features may be subject to significant biophysical changes as a consequence of the proposed development under assessment.

2.2 For the purposes of this assessment, the preliminary ZOIs within which ecological features were searched for as part of this desk study were varied according to the geo-spatial and/or legal significance of the feature.

2.3 Table 1 summarises the scope and the preliminary ZOIs applied for this desk study. The preliminary ZOIs were applied by extending search radii of the respective distances from the site boundary.

Table 1: Scope and preliminary ecological Zones of Influence (ZOI)

Feature	Scope	Key Source(s)	ZOI
Statutory wildlife sites:	Ramsar sites Proposed Ramsar sites Special Areas of Conservation (SAC) Possible SAC SAC with marine components Special Protection Areas (SPA) Potential SPA Marine Conservation Zones	Natural Resources Wales (NRW) (public sector information) Natural England (public sector information)	10km
	Sites of Special Scientific Interest (SSSI) National Parks National Nature Reserves (NNR) Marine Nature Reserves (MNR)	NRW Natural England	5km
	Local Nature Reserves (LNR) Country Parks	NRW DataMapWales	2km
Non-statutory wildlife sites:	County Wildlife Sites (CWS) Local Wildlife Sites (LWS) Sites of Importance for Nature Conservation (SINC)	Cofnod Records Centre Wrexham Unitary Development Plan[1] Wrexham Unitary Development Plan Proposals Map 2 (Side 2)[2]	2km
Notable habitats:	Ancient Woodland Habitats of principal importance Main rivers Habitat Network / Nature Recovery Network	DataMapWales North Wales Environmental Information Service (Cofnod)	500m

[1] Wrexham County Borough Council (2005). Wrexham Unitary Development Plan. [Online] Available at: *https://www.wrexham.gov.uk/sites/default/files/2020-05/udp-statement.pdf* [Accessed 17th March 2023].

[2] Wrexham County Borough Council (2005). Wrexham Unitary Development Plan Policies Map 2 (Side 2). [Online] Available at: *https://www.wrexham.gov.uk/sites/default/files/2021-03/map2_inset2_inset3.pdf* [Accessed 17th March 2023].

Feature	Scope	Key Source(s)	ZOI
Protected or notable species:	Pre-existing records for protected or notable species[3], non-native invasive species	Cofnod	2km
Policy and Related Guidance	Land allocations and relevant environment / biodiversity policy	Wrexham County Borough Council Planning Policy and Proposals Map	As applicable to site

2.4 An absence of records does not indicate the absence of protected species from the search area.

[3] Notable and protected species records may include those listed under any of the following:

- Protected species listed under Schedule 2 (animals) or Schedule 5 (plants) under the Conservation of Habitats and Species Regulations 2017 (EPS);
- Protected bird species under Schedule 1 of the Wildlife and Countryside Act 1981, as amended (WCA1);
- Protected animal species under Schedule 5 of the Wildlife and Countryside Act 1981, as amended (WCA5);
- Protected plant species under Schedule 8 of the Wildlife and Countryside Act 1981, as amended (WCA8);
- Invasive non-native plant species under Schedule 9 of the Wildlife and Countryside Act 1981, as amended (WCA9);
- Invasive Alien Species (Enforcement and Permitting) Order 2019 (IAS);
- Protection of Badgers Act 1992 (PBA);
- Species of principal importance (SPI) under Section 7 of the Environment (Wales) Act 2016 (S7);
- Red and Amber listed Birds of Conservation Concern (UK) (BRd/BAm); and
- Local Biodiversity Action Plan Species (LBAP).

3.0 Legislation and Policy

3.1 This section details legislation and planning policy which may have relevance to the site. Only legislation and policy of key relevance to biodiversity are included.

Relevant Legislation

International Conventions

3.2 The UK is a Contracting Party to numerous environmental conventions, the commonest form of international agreements to encourage a coordinated response to managing the environment. Key environmental conventions ratified in the UK include:

- The Convention on Wetlands of International Importance especially as Waterfowl Habitat ('Ramsar Convention'[4] or 'Wetlands Convention') - provides the only international mechanism for protecting sites of global importance;
- The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention[5]) - imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species;
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention[6] or CMS) - provides strict protection for endangered migratory species. The UK has currently ratified four legally binding Agreements under the convention relating to bats (EUROBATS), African-Eurasian migratory birds (AEWA), small cetaceans in the Baltic, Irish and North Seas (ASCOBANS) and albatrosses and petrels (ACAP) in addition to five Memorandum of Understanding (MoU) and is non-party range state to a further Agreement and a further MoU;
- The Convention Concerning the Protection of the World Cultural and Natural Heritage (UNESCO World Heritage Convention) - seeks to protect both cultural and natural heritage;
- The Convention on Biological Diversity (Biodiversity Convention[7] or CBD) - provides a legal framework for biodiversity conservation. Within the UK, delivery of the CBD and the Strategic Plan for Biodiversity 2011-2020[8] is guided by the UK Post-2010 Biodiversity Framework[9].

[4] Convention on Wetlands of International Importance especially as Waterfowl Habitat, Ramsar, 2.2.1971 *https://www.ramsar.org/*

[5] Convention on the Conservation of European Wildlife and Natural Habitats. Bern, 1979 *https://www.coe.int/*

[6] Convention on the Conservation of Migratory Species of Wild Animals, Bonn, June 1979 *https://www.cms.int/*

[7] Convention on Biological Diversity, Rio de Janeiro, June 1992*https://www.cbd.int/*

[8] In October 2010, at the 10th Conference of the Parties to the CBD in Nagoya, Japan, the Parties adopted a new 'Strategic Plan for Biodiversity 2011–2020' along with its 20 'Aichi targets'. *https://www.cbd.int/sp/*

[9] The framework is overseen by the Environment Departments of the four UK governments working through the Four Countries' Biodiversity Group. It demonstrates how the UK, through each of the four countries, contributes to achieving the 'Aichi targets', and identifies the activities required to complement the individual country biodiversity strategies *https://jncc.gov.uk/our-work/uk-post-2010-biodiversity-framework/*

3.3 The legal obligations of the multiple Conventions to which the UK is a Contracting Party are enacted through a suite of national environmental legislation. The most relevant are described in the following paragraphs.

Conservation of Habitats and Species Regulations

3.4 The Conservation of Habitats and Species Regulations 2017[10] (2017 Regulations) transposed the land and marine aspects of the Habitats Directive (Council Directive 92/43/EEC) and certain elements of the Wild Birds Directive (Directive 2009/147/EC) (known as the Nature Directives) into domestic law.

3.5 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[11] (2019 Regulations) amends the 2017 Regulations to make them operable following the withdrawal of the United Kingdom from the European Union (EU). Most of the changes involve transferral of functions from European Commission to the appropriate authorities in England and Wales, also extending to Scotland and Northern Ireland and applies to Scotland and Northern Ireland (including the adjacent territorial sea to a limited degree), as regards reserved and excepted matters respectively. It also amends Section 27 of the Wildlife and Countryside Act 1981 to maintain existing protections and enforcement for species of wild birds.

3.6 All other processes or terms in the 2017 Regulations remain unchanged and existing guidance and obligations (of a competent authority) remain relevant.

National Site Network

3.7 Under the 2019 Regulations, Special Areas of Conservation (SAC) and Special Protection Areas (SPA) in the UK no longer form part of the EU's 'Natura 2000' ecological network, but instead (along with new SACs and SPAs designated under the 2019 Regulations) form the new National Site Network (NSN). Ramsar sites[4] do not form part of the NSN but remain protected in the same way as SACs and SPAs.

3.8 Proposals which may significantly affect a site belonging to the NSN and which are not connected with or necessary to the management of that site require (by Regulations 63 and 64 of the 2017 Regulations, as amended by Regulations 24 and 25 of the 2019 Regulations, respectively) competent authorities to undertake an Appropriate Assessment of the implications of the plan or project in view of that site's conservation objectives. This process is commonly referred to as a 'Habitats Regulations Assessment' (HRA). The assessment must consider the potential effects both of the plan/project itself and in combination with other plans or projects. Where an adverse effect on the site's integrity cannot be ruled out, and where there are no alternative solutions, the plan or project can only proceed if there are imperative reasons of over-riding public interest (IROPI) and if the necessary compensatory measures can be secured.

[10] Conservation of Habitats and Species Regulations 2017 (SI 2017/1012) *https://www.legislation.gov.uk/uksi/2017/1012/*

[11] Conservation of Habitats and Species Regulations 2019 (SI 2019/579) *https://www.legislation.gov.uk/uksi/2019/579/*

Protected Species

3.9 Certain animals and their breeding sites or resting places are protected under Regulation 43 of the 2017 Regulations, which makes it illegal to:

- Deliberately capture, injure or kill any such animal or to deliberately take or destroy the eggs of such an animal;
- Deliberately disturb such an animal; and
- Damage or destroy a breeding site or resting place of such an animal.

3.10 Disturbance is defined in the 2017 Regulations as an activity which is likely to impair a species' ability to survive, to breed or reproduce, to rear or nurture young or, in the case of animals hibernating or migratory species, to hibernate, migrate or which may affect significantly the local distribution or abundance; of the species.

3.11 A bat's resting place is known as a roost site. Because bats tend to be faithful to roost sites but their biology is such that different roost site characteristics are preferred at different times of the year by different species for different functions, a bat roost is considered to be afforded protection even when it is not occupied.

3.12 Certain plant species are protected under Regulation 47 of the 2017 Regulations against deliberate picking, collecting, cutting, uprooting or destruction. It is also an offence to be in possession or control and to transport any live or dead plant or part of a plant of such a species which has been taken in the wild.

3.13 The 2017 Regulations (Regulation 55) enables a relevant licensing body to grant a licence for certain activities that may affect animal or plant species protected by the above provisions. The purpose must conform to one of those listed under Regulation 55(2). For most development related activities, the purpose normally relates to Regulation 55(2)(e) 'preserving public health or public safety or other imperative reasons of overriding public interest, including those of a social or economic nature and beneficial consequence of primary importance for the environment' – commonly known as the IROPI test. Regulation 55(9) introduces two further tests that the licensing body must consider:

- There is no satisfactory alternative; and
- The favourable conservation status of the species concerned will be maintained and/or enhanced.

3.14 Under Regulation 9(1) of the 2017 Regulations (as amended), competent authorities "must exercise their functions which are relevant to nature conservation… so as to secure compliance with the requirements of the Directives". Regulation 9(3) requires a competent authority, in exercising any of its function, to "have regard to the requirements of the Directives so far as they be affected by the exercise of those functions." Local planning authorities must therefore consider the above three 'tests' when determining if planning permission should be granted for developments likely to cause an offence under the Regulations.

Wildlife and Countryside Act 1981

3.15 The Wildlife and Countryside Act 1981 (as amended)[12] (WCA) is a major legal instrument for wildlife protection in the UK. In respect of habitats and flora, the WCA protects important habitats and/or species as Sites of Special Scientific Interest (SSSI). The designation of UK Ramsar sites[4] has usually been underpinned through prior notification of these areas as SSSI and accordingly they receive statutory protection under the WCA.

3.16 The obligations of the Bern Convention[5] (the protection of wild plant and animal species and their natural habitats) are transposed into law for England and Wales[13] by the WCA. The legal requirement for the protection of migratory species listed by the Bonn Convention[6] is also provided by the WCA.

3.17 All wild birds (as defined by the WCA and with exception to species listed in Schedule 2) are protected under the WCA, which makes it illegal to:

- Intentionally kill, injure or take any wild bird;
- Take, damage or destroy the nest (whilst being built or in use) of any wild bird; or
- Take or destroy the eggs of any wild bird.

3.18 Special penalties are available for offences related to birds listed in Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young. The Secretary of State may also designate Areas of Special Protection (subject to exceptions) to provide further protection to birds. The WCA also prohibits certain methods of killing, injuring, or taking birds, restricts the sale and possession of captive bred birds, and sets standards for keeping birds in captivity.

3.19 Certain animal species (listed under Schedule 5) of the WCA receive protection which makes it illegal (with certain exceptions) to:

- Intentionally kill, injure or take any such animal;
- Intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any such animal;
- Intentionally or recklessly disturb such animals while they occupy a place used for shelter or protection.

3.20 Plant species listed under Schedule 8 of the WCA are protected from unauthorised intentional picking, uprooting and destruction. It is an offence to plant or otherwise cause to grow in the wild any plant that is included in Schedule 9.

[12] Wildlife and Countryside Act 1981 c. 69 *https://www.legislation.gov.uk/ukpga/1981/69/*

[13] In Scotland by the Nature Conservation (Scotland) Act 2004 (as amended) and in Northern Ireland by Wildlife (Northern Ireland) Order 1985 and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985.

Countryside and Rights of Way Act 2000

3.21 Part III of the Countryside and Rights of Way Act 2000[14] (CROW) deals specifically with wildlife protection and nature conservation. It requires that Government Departments have regard for the conservation of biodiversity, in accordance with the CBD. In addition, it requires that The Secretary of State publishes a list of living organisms and habitat types that are considered to be of principal importance in conserving biodiversity.

3.22 CROW also amends the WCA, expanding the terms of offences to include reckless activity. It increases the legal protection of threatened species, by also making it an offence to "recklessly" obstruct access to a sheltering place used by an animal listed in Schedule 5 of the WCA or "recklessly" disturb an animal occupying such a structure or place.

Environment (Wales) Act 2016

3.23 Section 6 of the Environment Act places a duty on public authorities to 'seek to maintain and enhance biodiversity' so far as it is consistent with the proper exercise of those functions. In so doing, public authorities must also seek to 'promote the resilience of ecosystems'.

3.24 Section 7 of the Environment (Wales) Act requires The Welsh Ministers to publish, review and revise lists of living organisms and types of habitat in Wales, which they consider are of key significance to sustain and improve biodiversity in relation to Wales. This is known as the S7 list.

Hedgerows Regulations 1997

3.25 Important hedgerows are protected from removal by the Hedgerows Regulations[15] (as amended). Regulation 3 defines the hedgerows to which the Regulations apply. Regulation 4 sets out the criteria for identifying "important hedgerows" including ecological, landscape or historical/cultural reasons. Under the Hedgerows Regulations it is against the law to remove or destroy certain hedgerows without permission from the local planning authority. Works to "important hedgerows" are exempt under the Hedgerows Regulations if planning consent is granted which allows their removal.

3.26 The identification of important hedgerows also provides an additional means to value hedgerows aside from their botanical value (e.g. species richness) as the assessment of importance also includes characteristics relating to maturity and structure (e.g. associated features, connectivity, integrity) which will affect the functional value of the hedgerow.

[14] Countryside and Rights of Way Act 2000 c. 37 *https://www.legislation.gov.uk/ukpga/2000/37/*

[15] The Hedgerow Regulations 1997 (SI 1997/1167) *https://www.legislation.gov.uk/uksi/1997/1160/*

Protection of Badgers Act 1992

3.27 Badgers and their setts receive statutory protection under the Protection of Badgers Act 1992 (PBA)[16]. This makes it an offence to wilfully kill, injure, take, possess or cruelly ill-treat a badger, or to attempt to do so; or to intentionally or recklessly interfere with a sett.

3.28 Sett interference includes disturbing badgers whilst they are occupying a sett, as well as damaging or destroying a sett or obstructing access to it. A badger sett is defined in the legislation as "any structure or place, which displays signs indicating current use by a badger."

Relevant Policy

Planning Policy Wales Edition 11 (2021)

3.29 Planning Policy Wales (Edition 11, February 2021) delivers land use planning policy for Wales and provides a framework for the effective preparation of local planning authorities' development plans. This is supplemented by 21 topic based Technical Advice Notes (TANs). Technical Advice Note 5- Nature Conservation and Planning is a key TAN in relation to nature conservation and biodiversity.

3.30 TAN 5 states that the town and country planning system in Wales should:

- Work to achieve nature conservation objectives through a partnership between local planning authorities, NRW, the Environment Agency Wales, voluntary organisations, developers, landowners and other key stakeholders;
- Integrate nature conservation into all planning decisions looking for development to deliver social, economic and environmental objectives together over time;
- Ensure that the UK's international and national obligations for site, species and habitat protection are fully met in all planning decisions;
- Look for development to provide a net benefit for biodiversity conservation with no significant loss of habitats or populations of species, locally or nationally;
- Help to ensure that development does not damage, or restrict access to, or the study of, geological sites and features or impede the evolution of natural processes and systems especially on rivers and the coast;
- Forge and strengthen links between the town and country planning system and biodiversity action planning particularly through policies in local development plans and the preparation of supplementary planning guidance that adds value to Local Biodiversity Action Plans (LBAPs) by highlighting the ways in which the planning system can help to deliver the objectives of LBAPs in practical ways; and
- Plan to accommodate and reduce the effects of climate change by encouraging development that will reduce damaging emissions and energy consumption and that help habitats and species to respond to climate change.

[16] Protection of Badgers Act 1992 c. 51 *https://www.legislation.gov.uk/ukpga/1992/51/*

Local Planning Policy

Natural Resources Wales Area Statements

3.31 NRW has developed seven Area Statements covering different areas of Wales. These statements are seen as a collaborative response to the Natural Resources Policy, published by the Welsh Government in 2017.

3.32 The following sections of the Area Statement relate to biodiversity and nature conservation in Northeast Wales:

- Promoting the resilience of ecosystems in maintaining and enhancing biodiversity[17].

Wrexham Unitary Development Plan 1996 – 2011 (adopted 14th February 2005)

3.33 The Wrexham Unitary Development Plan (UDP) is the adopted development plan for the Borough and sets out the council's spatial vision for the 15-year period from 1996 until 2011.

3.34 The following policies in the Wrexham UDP are of relevance to biodiversity and/or the site's allocation:

Strategic Policies

- Policy PS2: Development must not materially detrimentally affect countryside, landscape/townscape character, open space, or the quality of the natural environment.
- Policy PS11: Encouragement will be given to proposals which improve the biodiversity value of sites and to the establishment of local nature reserves where the nature conservation and landscape interest of the land will be protected and enhanced.

Specific Policies

- Policy GDP1: Development Objectives
- Policy EC4: Hedgerows, Trees and Woodland
- Policy EC6: Biodiversity Conservation

Relevant Local Planning Guidance Notes

- LPGN 17: Trees and Development
- LPGN 29: Employment Development and Nature Conservation
- LPGN 30: Design
- LPGN 32: Biodiversity and Development

[17] Natural Resources Wales. Promoting the resilience of ecosystems in maintaining and enhancing biodiversity. [Online] Available at: *https://naturalresources.wales/about-us/area-statements/north-east-wales-area-statement/promoting-the-resilience-of-ecosystems-in-maintaining-and-enhancing-biodiversity/?lang=en* [Accessed 17th March 2023].

Wrexham Local Development Plan 2 (LDP2) 2013 – 2028

3.35 The Wrexham Local Development Plan 2 (LDP2)[18] is a long-term land use and development strategy focused on achieving sustainable development. The LDP2 is currently being prepared by Wrexham County Borough Council and will replace the current adopted UDP.

Local Planning Guidance Notes

3.36 Wrexham County Borough Council have approved a series of local planning guidance notes to support their Development Plan policy.

3.37 The planning guidance notes of relevance to biodiversity and/or the site's allocation include:

- Employment Development and Nature Conservation[19]; and
- Biodiversity & Development[20].

Local Biodiversity Action Plans (LBAP)

3.38 The following habitats are identified within LBAPs by Wrexham Borough Council:

- Derelict and Industrial Land
- Garden
- Linear aquatic habitats (rivers, streams, canals)
- Ponds
- Upland moorland
- Woodland
- Lowland raised bog
- Lowland wood-pasture and parkland
- Wet woodland

3.39 The following species are identified within LBAPs by Wrexham Borough Council:

- Great crested newt *Triturus cristatus*
- Barn owl *Tyto alba*
- Song thrush *Turdus philomelos*
- Badger *Meles meles*
- Otter *Lutra lutra*

[18] Wrexham County Borough Council. Wrexham Local Development Plan 2 (LDP2) 2013 to 2028. [Online] Available at: *https://www.wrexham.gov.uk/service/development-plans-and-other-planning-policy/wrexham-local-development-plan-2-ldp2-2013-2028* [Accessed 17th March 2023].

[19] Wrexham County Borough Council (2009). Local Planning Guidance Note 29: Employment Development and Nature Conservation. [Online] Available at: *https://www.wrexham.gov.uk/sites/default/files/2020-05/lpg-29e.pdf* [Accessed 17th March 2023].

[20] Wrexham County Borough Council (2011). Local Planning Guidance Note 32: Biodiversity & Development. [Online] Available at: *https://www.wrexham.gov.uk/sites/default/files/2020-05/lpg-32e.pdf* [Accessed 17th March 2023].

- Lesser horseshoe bat *Rhinolophus hipposideros*
- Black poplar *Populus nigra*

4.0 Wildlife Sites

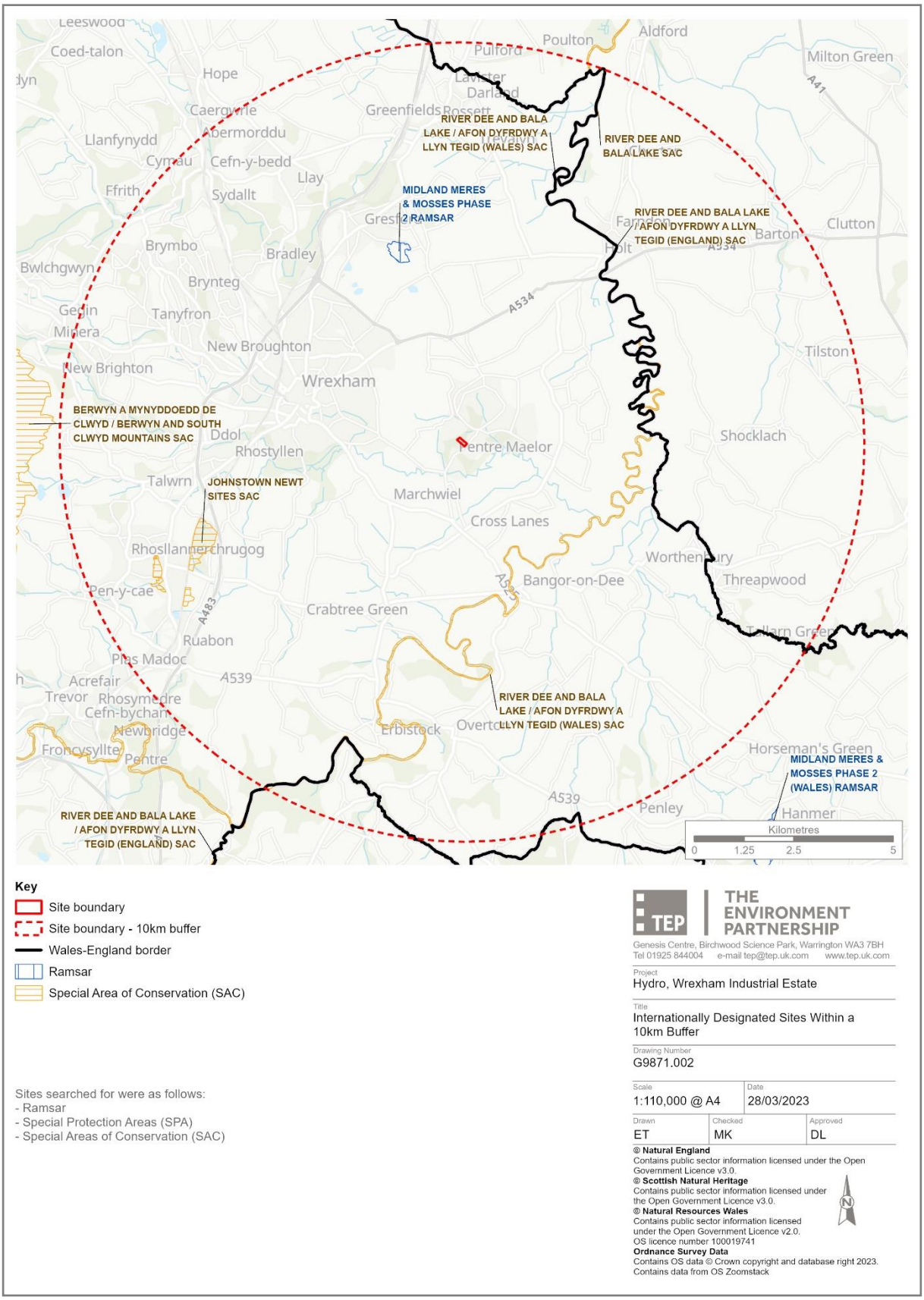
Statutory Sites

4.1 There are four internationally significant statutory wildlife designations within 10km of the site (Figure 2) and four nationally significant statutory wildlife sites within 5km of the site (Figure 3). These are detailed in Table 2 below. Links to citations are also provided.

Table 2: Statutory wildlife sites

Site Name	Designation & Citation Link	Location Relevant to Site	Reason for Site Designation
Statutory wildlife sites of international significance within 10km of the site (Figure 2)			
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales)	SAC – *Citation*	4.0km east	Annex I Habitats (Primary): ■ Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho Batrachion* vegetation Annex II Species (Primary): ■ Atlantic salmon *Salmo salar;* ■ Floating water-plantain *Luronium natans*; Annex II Species (Qualifying): ■ Sea lamprey *Petromyzon marinus;* ■ Brook lamprey *Lampetra planeri;* ■ Bullhead *Cottus gobio;* ■ Otter *Lutra lutra.*
River Dee and Bala Lake (England)	SAC – *Citation*	4.3km east	Annex I Habitats (Primary): ■ Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho Batrachion* vegetation Annex II Species (Primary): ■ Atlantic salmon*;* ■ Floating water-plantain; Annex II Species (Qualifying): ■ Sea lamprey*;* ■ Brook lamprey*;* ■ Bullhead*;* ■ Otter*.*
Midland Meres & Mosses Phase 2 (Wales)	Ramsar – *Citation*	4.7km northwest, beyond the A534	The site's primary interest is its wide range of lowland wetland types and successional stages within a distinct biogeographical area. Nationally important flora: ■ *Higher plants - Calamagrostis stricta, Carex elongate, Cicuta virosa* and *Thelypteris palustris.* ■ *Lower plants - Sphagnum pulchrum* and *Dicranum undulatum.* Bird species occurring at levels of national importance: *Peak counts in spring/autumn* ■ Northern shoveler *Anas clypeata.* *Peak counts in winter*

Site Name	Designation & Citation Link	Location Relevant to Site	Reason for Site Designation
			■ Great cormorant *Phalacrocorax carbo carbo, g*reat bittern *Botaurus sterraris stellaris* and *w*ater rail *Rallus aquaticus.* Nationally important invertebrates: ■ *Limnophila heterogyna, Atylotus plebeius, Hagenella clathrata, Limnophila fasciata, Carorita limnaea, Glyphipteryx lathamella, Trichiosoma vitellinae, Eilema serica, Brachythops wusteneii, Pachinematus xanthocarpos, Sittcus floricola, Lampronia fuscatella* and *Hybomitra lurida.*
Johnstown Newt Sites	SAC – *Citation*	6.5km southwest, beyond the River Clwedog, the A525 and the A483	■ Supports one of the largest known populations of great crested newts *Triturus cristatus* in Great Britain. ■ Good populations of the widespread amphibian species are also present. Annex II Species (Primary): ■ Great crested newt.
Statutory wildlife sites of national significance within 5km of the site (Figure 3)			
Afon Dyfrdwy (River Dee)	SSSI - *Citation*	3.4km east	■ The Afon Dyfrdwy is of special geological and biological interest. ■ Supports populations of floating water-plantain, slender hare's-ear *Bupleurum tenuissimum*, sea barley *Hordeum marinum*, hard-grass *Parapholis strigosa*, otter, Atlantic salmon, bullhead, brook lamprey, river lamprey *Lampetra fluviatilis*, sea lamprey, club-tailed dragonfly *Gomphus vulgatissimus* and other aquatic invertebrates.
Sontley Marsh	SSSI - *Citation*	3.5km southwest, beyond the River Clywedog and the A525	■ Sontley Marsh is of special botanical interest. ■ One of the best wetland examples in Clwyd of the "southern mesotrophic mire" type more characteristic of south-west Wales and, in North Wales, largely restricted to Ynys Môn, Dwyfor and Clwyd.
River Dee (England) SSSI	SSSI - *Citation*	4.3km east	■ The River Dee is notified for its nationally important transition through a range of river types from mesotrophic to eutrophic. ■ It is also notified for Atlantic salmon, otter, club-tailed dragonfly and fluvial geomorphology.
Vicarage Moss	SSSI - *Citation*	4.7km northwest, beyond the A534	■ Vicarage Moss is of special geomorphological and botanical interest. ■ Vicarage Moss is the largest example of a basin mire in Clwyd, the vegetation being distinctly zoned, particularly in the isolated mire occupying a subsidiary kettle hole to the south.



Key

- Site boundary
- Site boundary - 10km buffer
- Wales-England border
- Ramsar
- Special Area of Conservation (SAC)

Sites searched for were as follows:
- Ramsar
- Special Protection Areas (SPA)
- Special Areas of Conservation (SAC)

THE ENVIRONMENT PARTNERSHIP
Genesis Centre, Birchwood Science Park, Warrington WA3 7BH
Tel 01925 844004 e-mail tep@tep.uk.com www.tep.uk.com

Project: Hydro, Wrexham Industrial Estate

Title: Internationally Designated Sites Within a 10km Buffer

Drawing Number: G9871.002

Scale	Date
1:110,000 @ A4	28/03/2023

Drawn	Checked	Approved
ET	MK	DL

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Contains data from OS Zoomstack

Figure 2: Statutory wildlife sites of international significance within 10km of the site

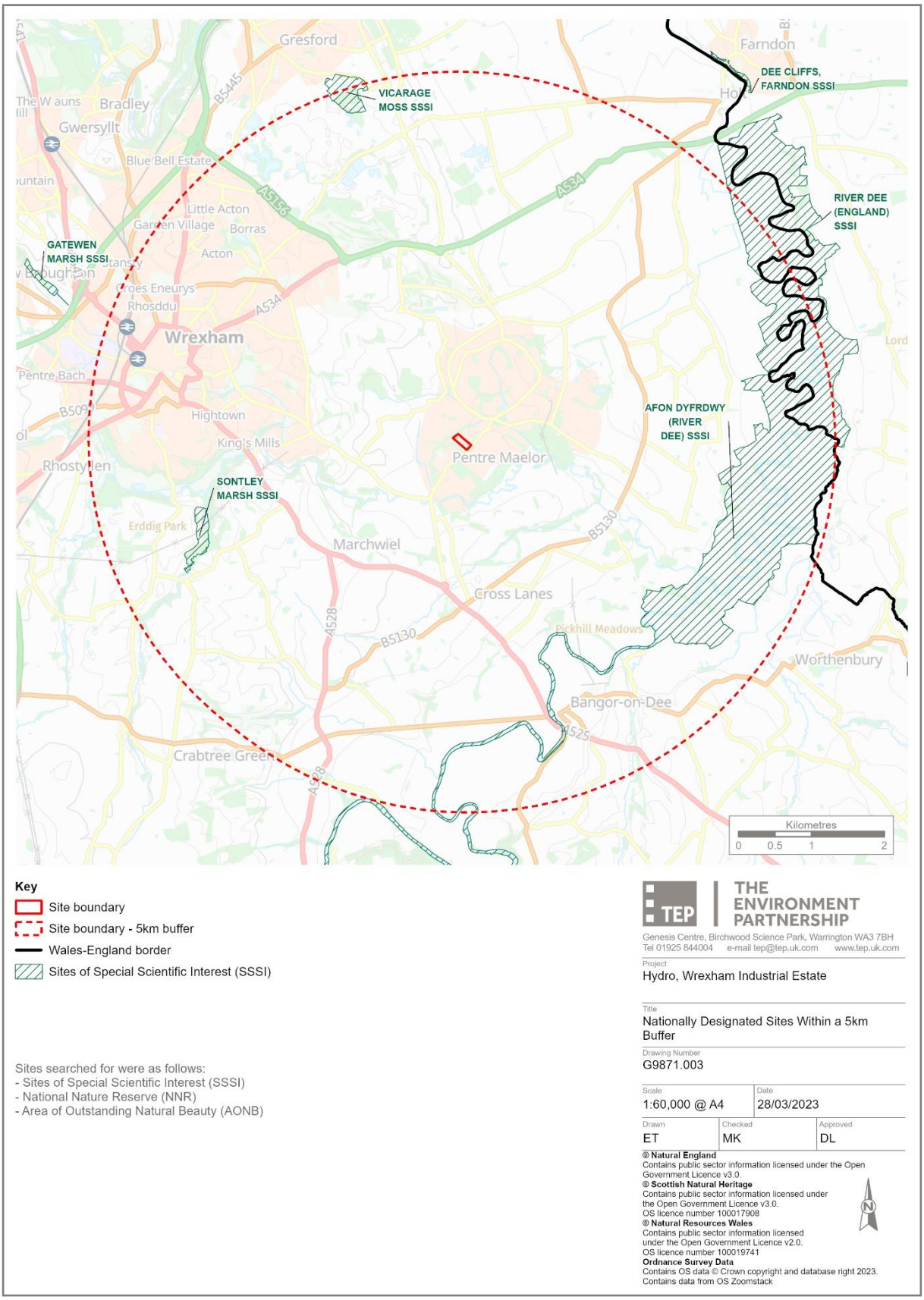


Figure 3: Statutory wildlife sites of national significance within 5km of the site

4.2 There are no statutory wildlife sites of regional / local significance within 2km of the site (Figure 4).

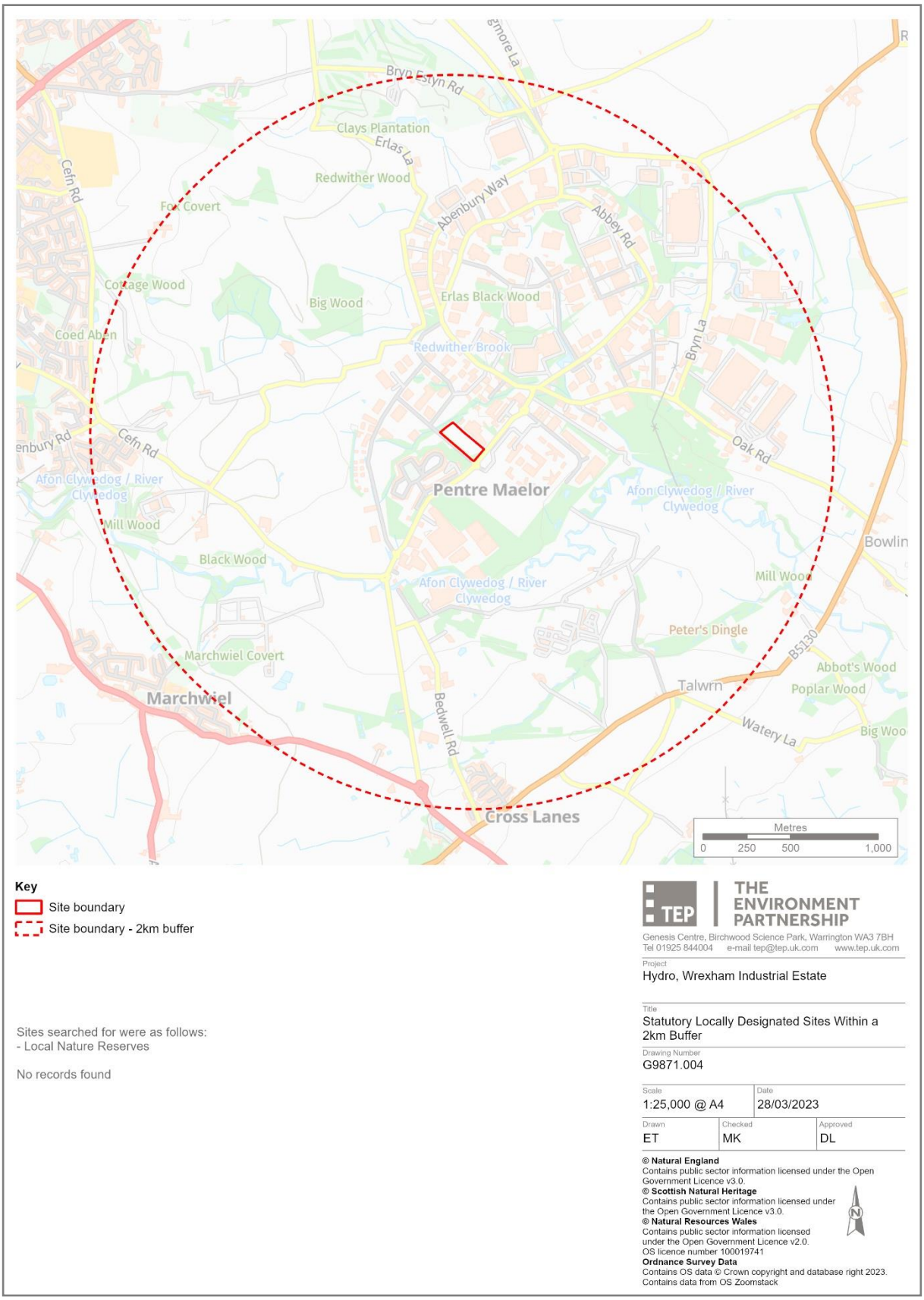


Figure 4: Statutory wildlife sites of regional/local significance within 2km of the site

Non-Statutory Wildlife Sites

4.3 There are four non-statutory locally designated wildlife sites within 2km of the site. These are summarised in **Error! Reference source not found.**3 below.

Table 3: Non-statutory local wildlife sites within 2km of the site

Site Name and Map Reference	Designation	Location Relevant to Site	Site Description and Key Interest Feature(s)
Wrexham Industrial Estate (Ref: 3)	LWS – *Citation*	0.73km north	A series of sites within the industrial estate which includes unmanaged grassland and ancient broadleaved woodland.
Cefn Park (Ref: 1)	LWS – *Citation*	0.82km northwest	A series of semi-natural broadleaved woodlands and fen habitats within Cefn Park Estate.
Peter's Dingle (Ref: 2)	LWS – *Citation*	1.57km southeast	Semi-natural broadleaved woodland, comprised of ash *Fraxinus excelsior*, sycamore *Acer pseudoplatanus* and dog's mercury *Mercurialis perennis*, along a brook.
Marchwiel Marsh (Ref: 4)	LWS – *Citation*	1.97km southwest	A marshy grassland dominated by rushes *Juncus* sp..



Figure 5: Non-statutory wildlife sites within 2km of the site (map provided by Cofnod)

5.0 Notable Habitats

Habitats of Principal Importance (HPI)

5.1 No notable habitat types identified on NRW priority habitat inventories are present within the site (Figure 6). However, an area of Ancient Semi Natural Woodland is present adjacent to the northwest boundary of the site.

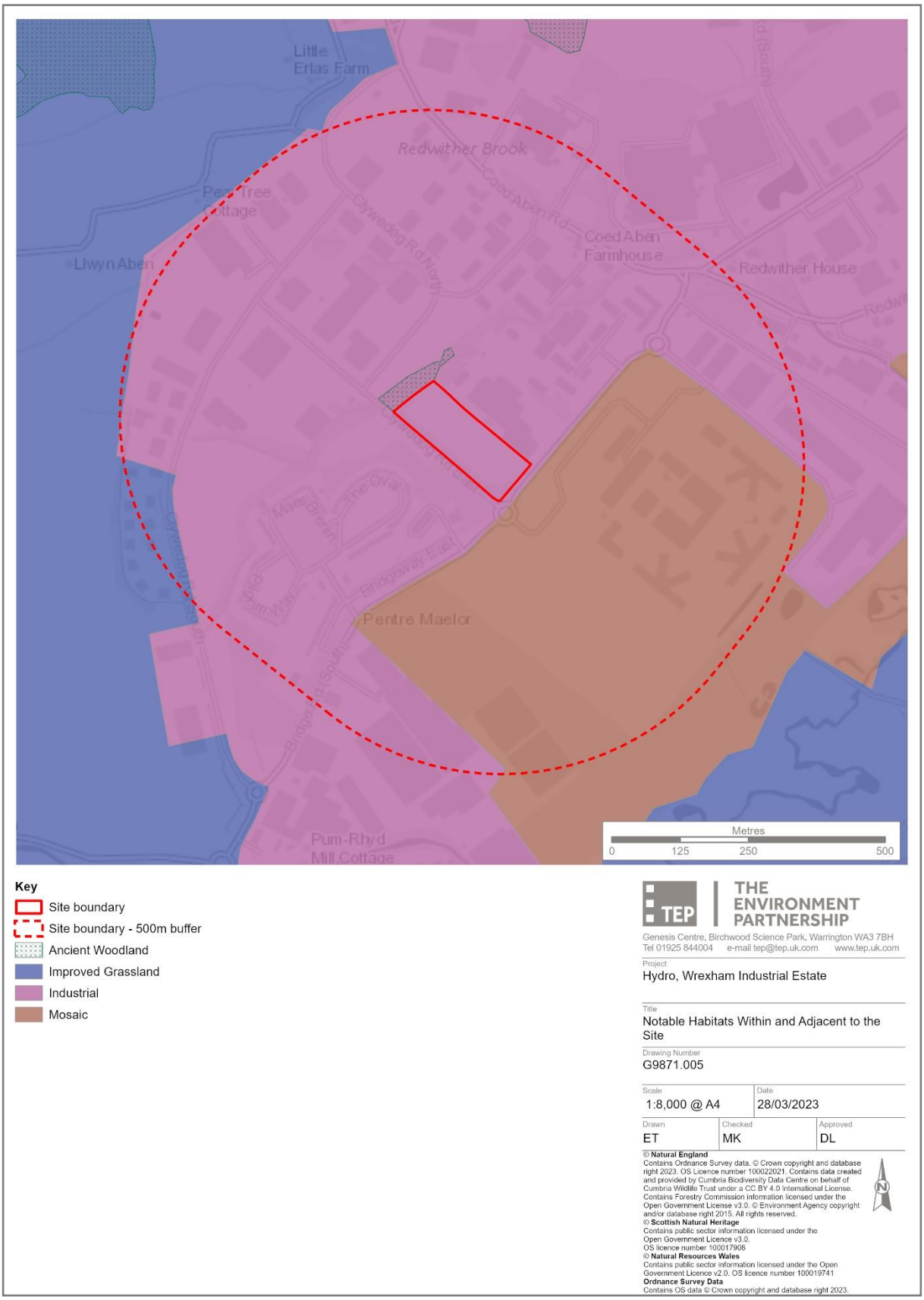


Figure 6: Notable habitats

6.0 Protected and Notable Species

Species Records

6.1 1,908 species records were returned from Cofnod for within 2km of the site. Records from within the last decade are summarised in Table 4. Birds are highly mobile, and the location of badger records are confidential; therefore, the precise locations of bird and badger records have not been provided.

Table 4: Summary of pre-existing species records returned by Cofnod

Name of Species	Relevant Legislation / Status	Number of records	Nearest record
Amphibians			
Common toad *Bufo bufo*	SPI	17	0.32km south
Great crested newt *Triturus cristatus*	EPS, WCA5, SPI, LBAP	45	0.32km south
Birds			
Barn owl *Tyto alba*	WCA1, LBAP	5	Within 2.00km
Black-headed gull *Chroicocephalus ridibundus*	BAm	3	Within 2.00km
Bullfinch *Pyrrhula pyrrhula*	SPI, BAm	7	Within 2.00km
Cetti's warbler *Cettia cetti*	WCA1	1	Within 2.00km
Crossbill *Loxia curvirostra*	WCA1	1	Within 2.00km
Cuckoo *Cuculus canorus*	SPI, BRd	1	Within 2.00km
Dunnock *Prunella modularis*	SPI, BAm	1	Within 2.00km
Fieldfare *Turdus pilaris*	WCA1, BRd	2	Within 2.00km
Goshawk *Accipiter gentilis*	WCA1	1	Within 2.00km
Great black-backed gull *Larus marinus*	BAm	1	Within 2.00km
Greenfinch *Chloris chloris*	BRd	1	Within 2.00km
Grey wagtail *Motacilla cinerea*	BAm	4	Within 2.00km
Herring gull *Larus argentatus*	SPI, BRd	7	Within 2.00km
Hobby *Falco subbuteo*	WCA1	1	Within 2.00km
House martin *Delichon urbicum*	BRd	3	Within 2.00km

Name of Species	Relevant Legislation / Status	Number of records	Nearest record
House sparrow *Passer domesticus*	SPI, BRd	2	Within 2.00km
Kestrel *Falco tinnunculus*	BAm	13	Within 2.00km
Kingfisher *Alcedo atthis*	WCA1	1	Within 2.00km
Lesser black-backed gull *Larus fuscus*	BAm	3	Within 2.00km
Lesser redpoll *Acanthis cabaret*	SPI, BRd	1	Within 2.00km
Linnet *Linaria cannabina*	SPI, BRd	1	Within 2.00km
Little ringed plover *Charadrius dubius*	WCA1	1	Within 2.00km
Mallard *Anas platyrhynchos*	BAm	1	Within 2.00km
Meadow pipit *Anthus pratensis*	BAm	2	Within 2.00km
Mistle thrush *Turdus viscivorus*	BRd	4	Within 2.00km
Moorhen *Gallinula chloropus*	BAm	1	Within 2.00km
Peregrine *Falco peregrinus*	WCA1	3	Within 2.00km
Redwing *Turdus iliacus*	WCA1, BAm	3	Within 2.00km
Reed bunting *Emberiza schoeniclus*	SPI, BAm	1	Within 2.00km
Rook *Corvus frugilegus*	BAm	4	Within 2.00km
Sedge warbler *Acrocephalus schoenobaenus*	BAm	3	Within 2.00km
Skylark *Alauda arvensis*	SPI, BRd	2	Within 2.00km
Song thrush *Turdus philomelos*	SPI, BAm, LBAP	4	Within 2.00km
Sparrowhawk *Accipiter nisus*	BAm	2	Within 2.00km
Starling *Sturnus vulgaris*	SPI, BRd	2	Within 2.00km
Stock dove *Columba oenas*	BAm	1	Within 2.00km
Swift *Apus apus*	BRd	4	Within 2.00km
Whitethroat *Sylvia communis*	BAm	5	Within 2.00km
Willow warbler	BAm	2	Within 2.00km

Name of Species	Relevant Legislation / Status	Number of records	Nearest record
Phylloscopus trochilus			
Woodcock *Scolopax rusticola*	BRd	3	Within 2.00km
Woodpigeon *Columba palumbus*	BAm	5	Within 2.00km
Wren *Troglodytes troglodytes*	BAm	3	Within 2.00km
Fish			
European eel *Anguilla anguilla*	SPI	2	1.08km north
Invertebrates			
Blood-vein *Timandra comae*	SPI	1	0.55km southeast
Cinnabar *Tyria jacobaeae*	SPI	1	0.80km northeast
Dingy skipper *Erynnis tages*	SPI	69	0.27km south
Grizzled skipper *Pyrgus malvae*	SPI	55	0.31km east
Latticed heath *Chiasmia clathrata*	SPI	4	0.47km south
Shaded broad-bar *Scotopteryx chenopodiata*	SPI	1	1.17km northeast
Small heath *Coenonympha pamphilus*	SPI	33	0.44km north
Mammals			
Brandt's bat *Myotis brandtii*	EPS, WCA5	2	0.86km northeast
Brown long-eared bat *Plecotus auritus*	EPS, WCA5, SPI	2	0.40km northeast
Common pipistrelle *Pipistrellus pipistrellus*	EPS, WCA5	7	0.43km northeast
Daubenton's bat *Myotis daubentonii*	EPS, WCA5	1	0.75km northeast
Eurasian badger *Meles meles*	[redacted]	[redacted]	[redacted]
Eurasian otter *Lutra lutra*	EPS, WCA5, SPI, LBAP	3	0.73km northeast
Myotis bat *Myotis sp.*	EPS, WCA5	2	0.75km northeast
Noctule *Nyctalus noctula*	EPS, WCA5, SPI	4	0.75km northeast
Polecat *Mustela putorius*	SPI	2	1.68km northeast
Soprano pipistrelle *Pipistrellus pygmaeus*	EPS, WCA5, SPI	3	1.05km north
West European hedgehog	SPI	3	0.44km northeast

Name of Species	Relevant Legislation / Status	Number of records	Nearest record
Erinaceus europaeus			
Plants			
Bluebell *Hyacinthoides non-scripta*	WCA8	1	0.86km northeast
Canadian waterweed *Elodea canadensis*	WCA9	1	1.08km north
Himalayan balsam *Impatiens glandulifera*	WCA9, IAS	2	1.12km east
Japanese knotweed *Fallopia japonica*	WCA9	3	0.43km northeast
Montbretia *Crocosmia pottsii x aurea = C. x crocosmiiflora*	WCA9	1	1.60km northeast
Pennyroyal *Mentha pulegium*	WCA8, SPI	1	1.41km northeast
Water fern *Azolla filiculoides*	WCA9	1	1.63km northeast
Reptiles			
Common lizard *Zootoca vivipara*	WCA5, SPI	1	1.42km northeast
Grass snake *Natrix helvetica*	WCA5, SPI	2	0.72km northeast

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Appendix B

Target Notes

Target Notes Report

Target Note TN1

TN1 Plantation broad-leaved woodland screening on large stepped bund

Galium aparine	Cleavers	A
Hedera helix	Ivy	A
Rubus fruticosus agg.	Bramble	A
Ranunculus repens	Creeping Buttercup	F
Taraxacum officinale agg.	Dandelion	F
Urtica dioica	Nettle	F
Dactylis glomerata	Cock's-foot	O
Epilobium sp.	Willowherb species	O
Geranium robertianum	Herb-Robert	O
Heracleum sphondylium	Hogweed	O
Lolium perenne	Perennial Ryegrass	O
Rumex obtusifolius	Broad-leaved Dock	O
Acer campestre, Canopy	Field Maple	
Betula pendula, Canopy	Silver Birch	
Crataegus monogyna, Canopy	Hawthorn	
Pinus sylvestris, Canopy	Scots Pine	
Prunus spinosa, Canopy	Blackthorn	
Salix fragilis, Canopy	Crack Willow	



KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Target Note TN2

Modified Neutral Grassland on large, stepped bund

Lolium perenne	Perennial Ryegrass	A
Moss sp.	Moss species	A
Festuca rubra	Red Fescue	F
Juncus inflexus	Hard Rush	F
Potentilla reptans	Creeping Cinquefoil	F
Rubus fruticosus agg.	Bramble	F
Rumex obtusifolius	Broad-leaved Dock	F
Salix species	Willow species	F
Centaurea nigra	Knapweed	O
Cirsium arvense	Creeping Thistle	O
Cirsium vulgare	Spear Thistle	O
Epilobium sp.	Willowherb species	O
Geranium robertianum	Herb-Robert	O
Hedera helix	Ivy	O
Helminthotheca echioides	Bristly Oxtongue	O
Heracleum sphondylium	Hogweed	O
Juncus effusus	Soft Rush	O
Ranunculus acris	Meadow Buttercup	O
Taraxacum officinale agg.	Dandelion	O
Achillea millefolium	Yarrow	R
Bellis perennis	Daisy	R
Cupressus × leylandii	Leyland Cypress	R
Plantago lanceolata	Ribwort Plantain	R
Rumex acetosa	Common Sorrel	R
Tussilago farfara	Colt's-foot	R



KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Target Note TN3

Lower area of stepped bund comprises bare earth with some ephemeral species but mostly moss sp..



KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Target Note TN4

Low bund with dense/continuous scrub and ephemeral/perennial species

Rubus fruticosus agg.	Bramble	A
Crataegus monogyna	Hawthorn	F
Prunus spinosa	Blackthorn	F
Quercus robur	English Oak	O



KEY - D = Dominant, A = Abundant, F = Frequent, O = Occasional, R = Rare

Target Note TN5

Linear balancing pond adjacent to the northern/eastern site boundary. Dense cover of Typha species.

Appendix C

eDNA results letter 2024 1040068-10204

Client: Nicola Morris,
The Environment Partnership

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

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

www.adas.uk

Sample ID: ADAS-4214	Condition on Receipt: Good	Volume: Passed
Client Identifier: South Bryn Lane, 10204	Description: pond water samples in preservative	
Date of Receipt: 02/05/2024	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	10/05/2024
Degradation Control[§]	Within Limits	Real Time PCR	10/05/2024
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	10/05/2024
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	10/05/2024	Date of issue:	10/05/2024

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

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

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

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

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

Appendix 1: Interpretation of results

Sample Condition

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

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

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

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

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

What do my results mean?

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

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

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

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

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

Client: Nicola Morris,
The Environment Partnership

ADAS
Spring Lodge
172 Chester Road
Helsby
WA6 0AR

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

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Sample ID: ADAS-92	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: 1, 9871	Description: pond water samples in preservative	
Date of Receipt: 12/05/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	1 of 2	Real Time PCR	17/05/2023
Degradation Control[§]	Within Limits	Real Time PCR	17/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	17/05/2023
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Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	17/05/2023	Date of issue:	17/05/2023

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

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

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

Client: Nicola Morris,
The Environment Partnership

ADAS
Spring Lodge
172 Chester Road
Helsby
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Tel: 01159 229249
Email: Helen.Rees@adas.co.uk

www.adas.uk

Sample ID: ADAS-94	Condition on Receipt: Good	Volume: Passed
Client Identifier: 2, 9871	Description: pond water samples in preservative	
Date of Receipt: 12/05/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	1 of 2	Real Time PCR	17/05/2023
Degradation Control[§]	Within Limits	Real Time PCR	17/05/2023
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Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	17/05/2023	Date of issue:	17/05/2023

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

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

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

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

Appendix 1: Interpretation of results

Sample Condition

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

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2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

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

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

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

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

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

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

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

Client: Nicola Morris,
The Environment Partnership

ADAS
Spring Lodge
172 Chester Road
Helsby
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Tel: 01159 229249
Email: Helen.Rees@adas.co.uk

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Sample ID: ADAS-91, 9871	Condition on Receipt: Medium Sediment	Volume: Passed
Client Identifier: 3	Description: pond water samples in preservative	
Date of Receipt: 23/05/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	25/05/2023
Degradation Control[§]	Within Limits	Real Time PCR	25/05/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	25/05/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:		Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	25/05/2023	Date of issue:	25/05/2023

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

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

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

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

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

Appendix 1: Interpretation of results

Sample Condition

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

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

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

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

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

What do my results mean?

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

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

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

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Appendix D

Grizzled Skipper Survey by Conops Entomology Ltd

Hydro Aluminium Deeside Ltd.

Grizzled Skipper Survey

By:
Conops Entomology Ltd





Date: 27 June 2023

Report Number: 23.32



Report title: Hydro Aluminium Deeside Ltd.
Grizzled Skipper Survey

Report Number: 23.32

By: Andy Jukes BSc (Hons) MCIEEM FRES
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Table of Contents

1	Introduction	4
2	Grizzled skipper ecology	4
3	Methods and timings	5
4	Results summary	8
5	Discussion	9
6	Site assessment	10
7	Recommendations	11

1 Introduction

1.1 Conops Entomology Ltd was commissioned to undertake a survey of the grizzled skipper butterfly (*Pyrgus malvae*) on land at Hydro Aluminium Deeside Ltd on the Wrexham Industrial Estate, Wrexham.

1.2 The site is located at OS grid reference SJ 37565 49193.

1.3 The site is located on the southern side of Wrexham Industrial Estate, to the east of Wrexham city.

1.4 The site comprises two areas of wildflowers, short sward grass and bare ground, including large areas of creeping cinquefoil (*Potentilla reptans*).

2 Grizzled skipper ecology

UK status
The grizzled skipper is a butterfly listed in Section 42 of the Natural Environment and Rural Communities Act (NERC Act) as a species of principal importance (referred to as S42). It is also a species listed by Butterfly Conservation as 'high priority', as it has declined by 49% since the 1970s[1].

Habitat preferences
The grizzled skipper is one of a suite of butterflies that depend upon early succession habitats, also referred to as open mosaic swards. The habitat mosaic includes areas of bare ground and short patchy swards that include one or more of the preferred larval food plants. The crucial and critical feature of high-value habitat is that the larval food plants are able to grow prostrate over the bare ground in order to elevate the microclimatic conditions that the grizzled skipper females preferentially select when laying their eggs. This elevated microclimate increases the developmental rates of the egg and young larvae, and possibly increases the success of larval hatching.
The adults also utilize the bare ground and short turf areas for foraging and basking, and are frequently observed basking on bare ground areas, particularly on cool but sunny days. Areas of taller sward grassland may also be beneficial for roosting and sheltering adult butterflies.

Food plants
The larvae are reliant upon plant species of the Rosaceae family. The most frequently utilized are wild strawberry (*Fragraria vesca*), creeping cinquefoil (*P. reptans*), and agrimony (*A. eupatoria*).

Life cycle
The life cycle of the species is dominated by the spring period when it is an adult and when eggs are laid. The approximate broad timings of each life cycle stage are as follows:

ova: May–June (laid on the larval host plant)
larva: late May–late July (largely stays on the leaves of the host plant, forming a small tent made from a leaf)
pupa: late July–May (pupates within a cocoon of leaves in low-growing vegetation less than 30 cm in height)
adult: Late April–June.

[1] Butterfly Conservation (2023). *Grizzled skipper species page*. [online] Available at: http://butterfly-conservation.org/50-1011/grizzled-skipper.html [Accessed on 20 June 2023].

3 Methods and timings

3.1 The survey comprised an initial walk over of all areas (see Map 1) to locate any suitable breeding habitat (areas 1–3 on Map 1) for the grizzled skipper and areas of adult foraging or roosting.

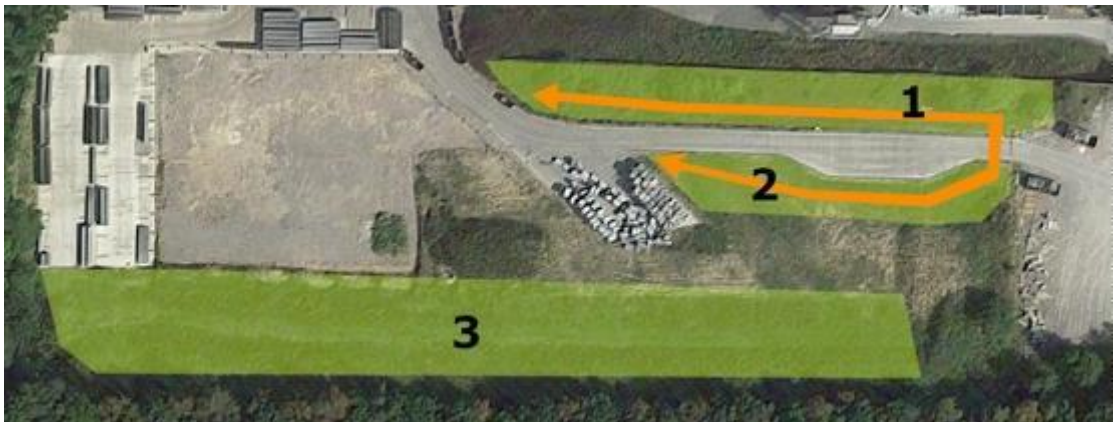
3.2 Suitable habitats are areas where the larval food plants are present, these being low-growing Rosaceae including creeping cinquefoil (*Potentilla reptans*) and over bare ground or very short turf.

3.3 Following the identification of key areas, a series of transect walks covering each area were conducted at least 10 times during each visit and all of the key areas.

3.4 Other notable (section 42) butterfly species were also noted during the transect walks.

3.5 The surveys were undertaken on the following dates:
17 May 2023: cool to warm and sunny, 14–17°C; and
30 May 2023: warm and sunny, 18–24°C.

Map 1 Areas of suitable habitat



Photograph 1 Looking west along area 1



Photograph 2 Looking west along area 2



Photograph 3 Looking west along area 3



4 Results summary

4.1 Grizzled skipper survey results:

Table 1 Grizzled skipper search

Survey date	Period of search (not including breaks)	Evidence
17/05/2023	9:30–13:00	*P. malvae* – average transect count = 4 adults No other butterflies of principal importance recorded
30/05/2023	12:00–14:40	*P. malvae* – average transect count = 2 adults No other butterflies of principal importance recorded

5 Discussion

Habitat suitability

5.1 The survey area is approximately 160 × 60 metres. Both sides of the road (areas 1 and 2 on Map 1) and an area on the southern side of the site (area 3 on Photograph 4) have a suitable breeding habitat with creeping cinquefoil (*P. reptans*) over bare ground.

5.2 The site, being industrial land, is low nutrient soils and rubble, which suits early successional plants and provides a warm microclimate. There is an abundance of creeping cinquefoil (*P. reptans*) along many areas of the site along with common bird's-foot trefoil (*Lotus corniculatus*), oxeye daisy (*Leucanthemum vulgare*), and common knapweed (*Centaurea nigra*) towards the boundaries.

5.3 Tall ruderals and brambles are also present, especially along the southern side of the site.

5.4 Grizzled skippers were noted on areas 1 and 2, but none were seen on area 3. The raised elevation of this area and its slightly cooler microclimate may be a factor limiting its suitability for breeding.

Photograph 4 Area 3, potential grizzled skipper breeding habitat



5.5 The short turf and bare ground component of the site is small and may be a limiting factor for sustaining a robust grizzled skipper colony.

5.6 However, Wrexham Industrial Estate is well known for its landscape-wide metapopulation of the species, and as such all sites, whether large or small, on which the species is recorded contribute to the robustness of the estate-wide resource of the butterfly, and all have a value because of that.

Other species of note

5.7 The NERC Act Section 42 dingy skipper butterfly (*Erynnis* tages) was not recorded from the site, despite there being patches of bird's-foot trefoil (*Lotus* spp.) plants on which it lays its eggs.

6 Site assessment

6.1 The site comprises three areas of suitable habitat for the grizzled skipper butterfly (see Map 1). However, adult activity was only recorded on areas 1 and 2. Area 3, being slightly elevated, may be suboptimal for the butterfly, but as it has a suitable habitat, it may be used intermittently by the butterfly.

6.2 The numbers of recorded adults are low (average of 3 adults per visit). This, however, is not the total colony size, only a gauge of the overall robustness of the species on the site. The colony size may be small, limited in size by the available suitable breeding habitat, but given the location of the site, being within the Wrexham Industrial Estate, it highly likely forms part of a metapopulation across the estate. This means that despite the site only holding a small colony, these individuals are highly likely to be mingling with other colonies across the Industrial Estate. This elevates the site's status, as these small colonies may be dependent upon each other to remain viable.

6.3 It is recommended that the site be viewed in this context and that efforts be made to retain the species on site through retention of a suitable breeding habitat, or if this cannot be retained, then another suitable habitat should be provided. This habitat should be at least of the same size as that which may be lost and of high value to the species. Advice on a suitable habitat for grizzled skipper is provided in the Recommendations section.

7 Recommendations

7.1 The success of any mitigation for loss of part or all of the site's key features will be dependent on incorporating the following habitats and features in juxtaposition with one another and creating features that are both extensive and optimal.

7.2 All invertebrate-related compensation should be undertaken on low-fertility soils.

7.3 It is important that all of the features noted in the recommendations form a mosaic and are retained or created in close proximity to one another and are in an optimal state. An optimal state for most of the features will be relatively easily achieved when utilizing nutrient-poor subsoils and/or reworking on-site materials.

Open mosaic swards

7.4 The bare ground constituent of the mitigation should include open areas that are exposed to full sun for much of the day, including the key period between 10:00 and 16:00 h.

7.5 The bare ground should include a minimum of 30% bare ground; the rest of the resource should be short turf and patchy short turf swards. The ground surface can be uneven, with divots and shallow depressions. The microtopography is an important feature, as it increases the value of the mitigation. Overworking of the material should be avoided, as this tends to result in an even surface, which is undesirable for invertebrate mitigation.

7.6 The floral composition should follow that of the following butterfly bank.

Butterfly banks

7.7 These are an important feature that benefits brownfield butterflies (such as the grizzled skipper and dingy skipper) and also a wider resource of pollinating invertebrates that require thermophilic features and high-density flower stands.

7.8 Butterfly banks are essentially mounded materials. These features are partially compacted with machinery, but other parts of the banks can be allowed to settle naturally to encourage niche variation, through slumping.

7.9 Medium, coarse aggregate material should be used for these banks. A limestone or other high-pH material is preferable, as this gives rise to a richer flora and promotes the important low-growing Rosaceae.

7.10 Optimally, the banks should have a southerly facing aspect for greatest sun exposure and in a crescent or sinuous shape, which further varies the microclimate of the feature.

7.11 Ideally, the banks should be *very sparsely* sown with a suitable flower mix from a *reputable source and of UK provenance*, allowed to colonize naturally, or plug-planted with suitable grizzled skipper larval food plants. A combination of all options can be used.

7.12 The following plants are essential and mandatory for inclusion on the banks and also open mosaic areas:

Grizzled skipper:

- creeping cinquefoil (*Potentilla reptans*)
- wild strawberry (*Fragaria vesca*)

- agrimony (*Agrimonia eupatoria*)

Dingy skipper:
- common bird's-foot trefoil (*Lotus corniculatus*)

Flowering swards

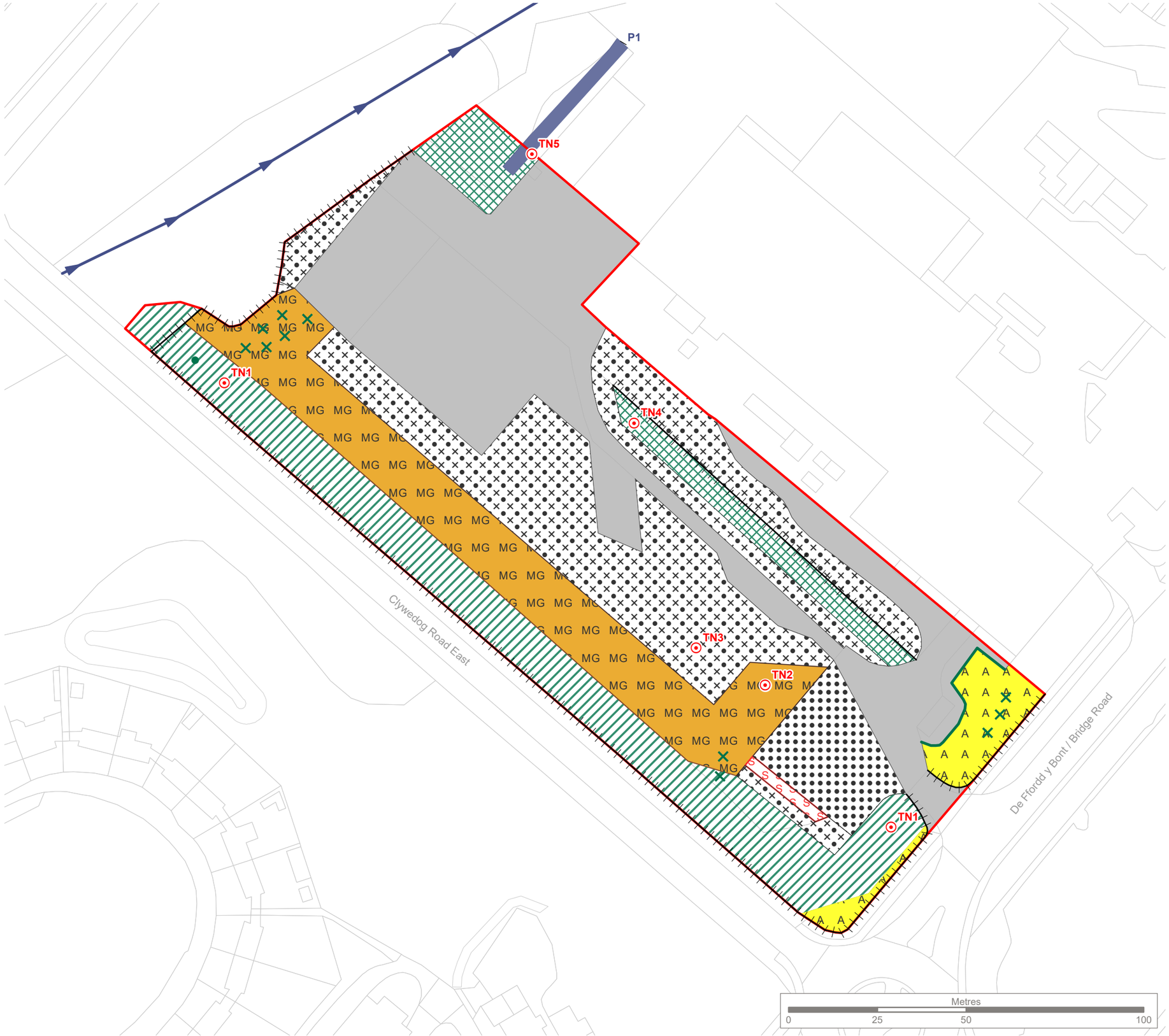
7.13 As part of the wider mosaic of feature used by grizzled skippers, principally for foraging and roosting, taller flowering areas should be sown with an appropriate mix of flowering plants from a reputable source and of UK provenance. This mix will also benefit the wider pollen- and nectar-foraging invertebrates and therefore can include the following:

- hawkweeds (*Hieracium* spp.)
- common bird's-foot trefoil (*Lotus corniculatus*)
- St. John's wort (*Hieracium* spp.)
- vetches (*Vicia* spp.)
- hawkbits (*Leontodon* spp.)
- red clover (*Trifolium pratense*)
- other trefoils (Fabaceae)
- meadow vetchling (*Lathyrus pratensis*)
- woundworts (*Stachys* spp.)
- wild carrot (*Daucus carota*).

7.14 The flowering swards should have a high density of flowers, and most standard mixes do not have a high enough proportion of flowering plants that are suitable for brownfield site mitigation, so a bespoke mix or additional ordering of supplementary flower seed is advised.

Drawings

G9871.007 Phase 1 Habitat Survey



KEY

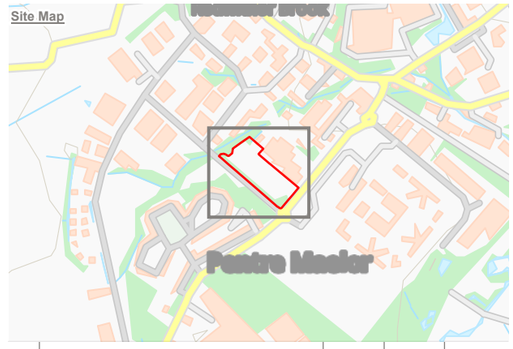
- Site boundary
- Target note
- Scattered scrub
- Scattered broad-leaved tree
- Running water
- Species-poor intact hedge
- Fence
- Plantation broad-leaved woodland
- Dense/continuous scrub
- Modified neutral grassland
- Standing water
- Spoil
- Amenity grassland
- Bare ground with ephemeral/short perennial
- Bare ground
- Hardstanding

Note:
The locations of habitats and habitat features are indicative.

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Site Map



Rev	Description	Drawn	Approved	Date
A	Additional land added to the North of the site.	MC	KR	07/06/2024

TEP THE ENVIRONMENT PARTNERSHIP

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Project
Hydro, Wrexham Industrial Estate

Title
Phase 1 Habitat Survey

Drawing Number
G9871.007A

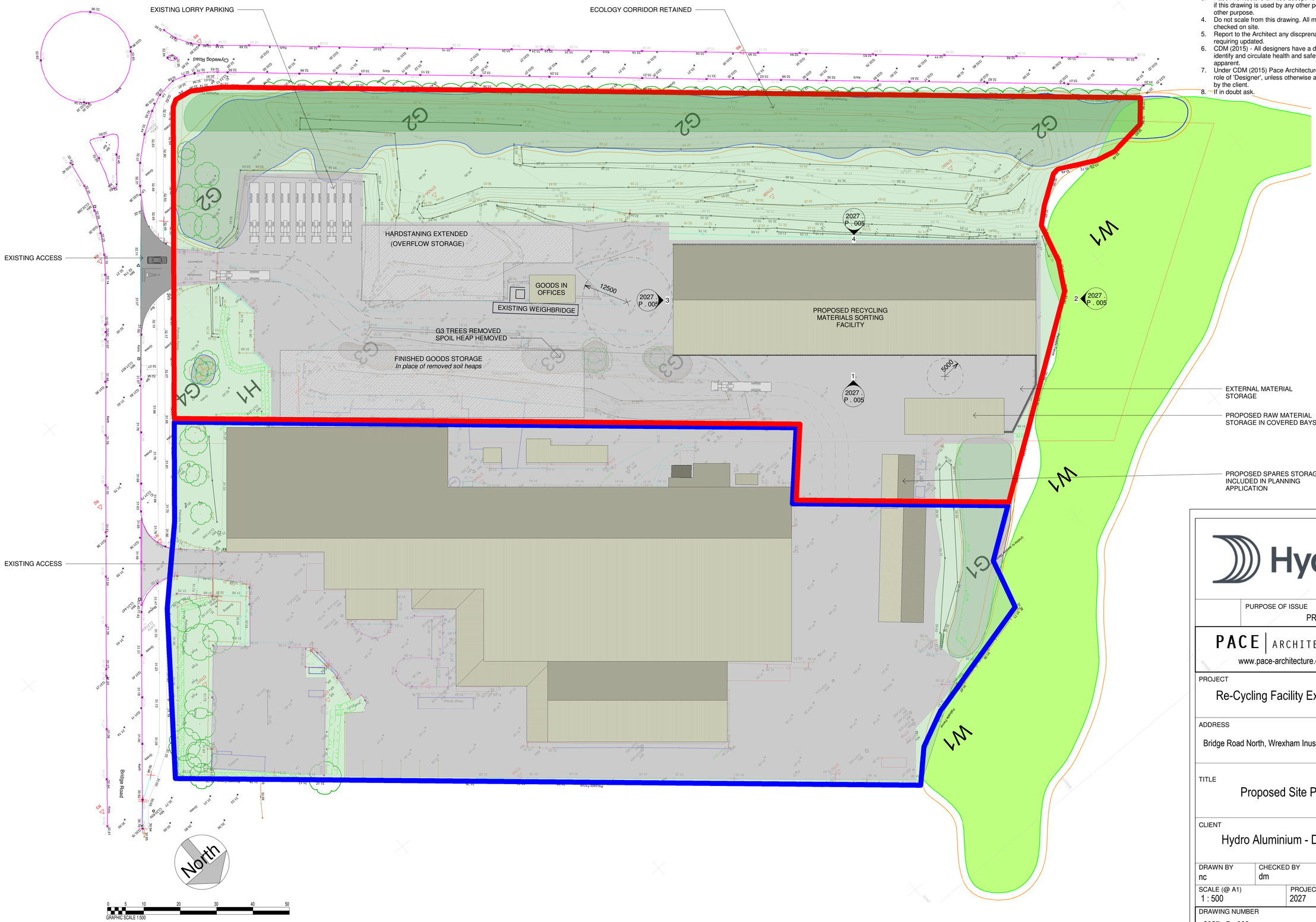
Drawn	Checked	Approved	Scale	Date
ET	MK	DL	1:1,100 @ A3	28/04/23

Drawings

2027. P. 003 - Proposed Site Plan_draft_23.05.24

1 Proposed Site Plan

1 : 500



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Hydro

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PROJECT
Re-Cycling Facility Expansion

ADDRESS
Bridge Road North, Wrexham Inustrial Estate

TITLE
Proposed Site Plan

CLIENT
Hydro Aluminium - Deeside

DRAWN BY	CHECKED BY	DATE
nc	dm	23.05.24

SCALE (@ A1)	PROJECT NUMBER
1 : 500	2027

DRAWING NUMBER	REV
2027 . P . 003	

23/05/2024 08:56:15

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