

Report Title	Proposed industrial development, land at Clywedog Road South, Wrexham Industrial Estate, Wrexham - Ecological Appraisal
Client	Tension Control Bolts Ltd
Date	March 2011

this report was produced by



Unit 23, The Malthouse Business Centre,
Regent Street, Llangollen, Denbighshire, LL20 8HS
01978 860889

This report has been prepared by Marches Ecology with all reasonable skill, care and diligence within the terms of the Contract with the client.

We disclaim any responsibility to the client and others in respect of any matters outside the scope of the above.

This report is confidential to the client and we accept no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known. Any such party relies on the report at their own risk.

Report Title	Proposed industrial development, land at Clywedog Road South, Wrexham Industrial Estate, Wrexham - Ecological Appraisal
Client	Tension Control Bolts Ltd
Marches Ecology Ref	C109/Clywedog Rd S/v4
Date issued	March 2011
Author	Max Ellson
Checked by	Tom Knight

CONTENTS

EXECUTIVE SUMMARY.....	4
1 INTRODUCTION.....	5
1.1 PROJECT BACKGROUND	5
1.2 PREVIOUS ECOLOGICAL SURVEY	5
1.3 THE PROPOSED DEVELOPMENT	5
1.4 LEGISLATION AND POLICY	6
1.5 STRUCTURE OF THIS REPORT.....	9
2 METHODOLOGY.....	10
2.1 CONTEXTUAL INFORMATION	10
2.2 EXTENDED PHASE 1 HABITAT SURVEY	10
2.3 DETAILED SURVEYS.....	13
2.4 SITE EVALUATION.....	15
3 RESULTS	17
3.1 CONTEXTUAL INFORMATION	17
3.2 WREXHAM BIODIVERSITY ACTION PLAN	18
3.3 EXTENDED PHASE 1 HABITAT SURVEY	18
3.4 DETAILED SURVEYS.....	23
4 EVALUATION.....	31
4.1 HABITAT AND FLORA.....	31
4.2 FAUNA.....	32
4.3 SUMMARY OF ECOLOGICAL VALUE.....	35
5 ECOLOGICAL ISSUES	36
5.1 GENERAL.....	36
5.2 FURTHER SURVEY AND MITIGATION	36
6 TARGET NOTES.....	42
7 REFERENCES.....	44
8 DATA	47

Figure 1 – Site Location

Figure 2 – Extended Phase 1 Habitat Survey

Figure 3 – Protected Sites within 1 km of survey site

Figure 4 – Ponds and known Great Crested Newt records within 500 m

EXECUTIVE SUMMARY

Marches Ecology was commissioned by Tension Control Bolts Ltd to undertake an Ecological Appraisal of a parcel of land at Clywedog Road South, Wrexham Industrial Estate, Wrexham (OS Grid Ref. SJ 370 494). The Ecological Appraisal is provided in support of a planning application for an industrial development at the site. The appraisal initially comprised a limited review of ecological background data (to provide contextual information) and an Extended Phase 1 Habitat Survey (undertaken on 03rd August 2009). Further to this survey and review of ecological background data (as well as consultation with Wrexham County Borough Council and the Countryside Council for Wales), further detailed surveys were undertaken in 2010 for Otter, Water Vole, reptiles and Great Crested Newts.

The survey site is characterised by species-rich neutral grassland and tall-herb vegetation, considered to be of district value. Seven plants of note were recorded; Cherry-plum, Prickly Lettuce, Grass Vetchling, Bristly Ox-tongue, Pepper-saxifrage, Hoary Ragwort and Common Adder's-tongue.

Evidence of species that receive specific legal protection recorded within the survey site was limited to Badger. Habitat that could potentially support several protected species was also noted; bats, Water Vole, Otter, Great Crested Newt, reptiles and breeding birds.

- The survey site is considered likely to provide mostly limited value for foraging bats, although the ditch/ stream corridor/ scrub (along the western boundary) may be of particular potential value for foraging/ commuting. No trees with any roost potential were recorded.
- No evidence of Water Vole and Otter (utilising the ditch/ stream corridor) was determined during detailed survey.
- The survey site provides high quality terrestrial habitat for Great Crested Newts. A presence/ absence survey for Great Crested Newts of all waterbodies within 500 m revealed Great Crested Newt eggs at two waterbodies, the closest of which is 310 m from the boundary of the survey site. Great Crested Newt eggs were also found in a ditch approximately 80 m to the north of the survey site. The background data search revealed that Great Crested Newts have been recorded terrestrially from land to the immediate north.
- No evidence of reptiles was determined during a presence/ absence survey; this indicates likely absence and that a significant population does not inhabit the survey area at the present time.
- The habitat resource available within the survey site is likely to provide opportunities for a small number of nesting birds including possibly ground-nesting species.

Individual Dingy Skipper was also recorded on two occasions within the survey site. Dingy Skipper is listed as a „Species of principal importance for the conservation of biological diversity in Wales“ under *Section 42* of the *NERC Act 2006*. It is considered that the population supported by the survey site is likely to be small (comprising a few individuals at most).

The proposed development as indicated on drawing no. 10/036/PL/03A indicates that approximately 63.22% of the survey site will be developed with the remaining 36.78% being provided as an ecological compensation area (to be subject to appropriate enhancement, including new ponds). An appropriate management plan will guide the long-term management of this area. In addition, mitigation associated with the development includes for a pre-construction survey for Badgers, appropriate lighting (with regards bats), proceeding under a Welsh Assembly Government „development“ licence with regards Great Crested Newt and clearance of vegetation outside the breeding bird season.

1 INTRODUCTION

1.1 Project Background

- 1.1.1 Marches Ecology was commissioned by Tension Control Bolts Ltd to undertake an Ecological Appraisal of a parcel at Clywedog Road South, Wrexham Industrial Estate, Wrexham (OS Grid Ref. SJ 370 494). The Ecological Appraisal is provided in support of a planning application for an industrial development at the site. The location of the proposed development site is shown on *Figure 1*.
- 1.1.2 This Ecological Appraisal report has three principal aims:
- to provide an initial appraisal of the ecological value of the site and local ecological resource;
 - to detail further surveys that may be required; and
 - to identify potential development constraints relating to ecology and outline potential mitigation.
- 1.1.3 The appraisal initially comprised a limited review of ecological background data (to provide contextual information) and an Extended Phase 1 Habitat Survey. The Extended Phase 1 Habitat Survey was undertaken on 03rd August 2009. Further to this survey and review of ecological background data (as well as consultation with Wrexham County Borough Council and the Countryside Council for Wales), further detailed surveys were undertaken in 2010 as follows:
- an Otter (*Lutra lutra*) and Water Vole (*Arvicola amphibius*) survey;
 - a reptile presence/ absence survey; and
 - a Great Crested Newt (*Triturus cristatus*) presence/ absence survey.

This report incorporates the findings of these surveys and data review.

1.2 Previous Ecological Survey

- 1.2.1 Marches Ecology undertook a site walkover of the survey site in December 2008 as part of an unrelated commission. Land immediately adjacent to the northern boundary of the survey site was subject to ecological survey in 2007 by Biota:

Biota (2007). *Ecological Survey at Clywedog Road, Wrexham Industrial Estate*.
Unpublished report (No. 2007/64).

This is referred to as appropriate within this Ecological Appraisal report.

1.3 The Proposed Development

- 1.3.1 Preliminary details of the proposed development are shown on a C4 Consulting LLP drawing no. 10/036/PL/03A entitled „*Clywedog Road South, Wrexham Industrial Estate, Wrexham, Proposed Site Layout*“ (dated 03/11). This indicative layout illustrates that the proposed development will comprise of the following:

- a single light industrial unit (of 40,000sq ft) – this will incorporate office accommodation and staff facilities, with associated surrounding areas of hard-standing (to include 54 car-parking spaces and a service yard; and
 - a separate terrace of five smaller light industrial units ranging in size from 3000 to 5000sq ft – associated areas of hard-standing will include 31 car-parking spaces.
- 1.3.2 A new access road will be provided off Clywedog Road South which will pass between the single light industrial unit to the north, and the separate terrace of five smaller light industrial units. Both areas (and the proposed ecological compensation area, refer below) will be surrounded by 2 m high security fencing. A 2 m wide footpath will also be provided between the development site and Clywedog Road South. It is likely that the development will be phased with the separate terrace developed after the single light industrial unit.
- 1.3.3 The „survey site“ (comprising both the proposed development site and compensation area) is approximately 2.42 hectares in size. The proposed development footprint itself (as described above) will incorporate approximately 1.53 hectares (63.22%) with approximately 0.89 hectares (36.78%) to be set aside as an ecological compensation area (refer to *Section 5*). The ecological compensation area is mostly located along the western side of the survey site, with additional narrow zones located adjacent to the northern and southern boundaries.

1.4 Legislation and Policy

Introduction

- 1.4.1 This sub-section provides a brief summary of key relevant legislation. It should not be considered a comprehensive review and is not meant to be so. It is provided here for information only and is not intended to replace specialised legal advice. It does not replace the text of the legislation, but summarises the salient points.

Badgers

- 1.4.2 The Badger is protected in Britain under the *Protection of Badgers Act 1992* and *Schedule 6* of the *Wildlife and Countryside Act 1981* (as amended). The legislation affords protection to Badger and Badger setts, and makes it a criminal offence to:
- wilfully kill, injure, take, possess or cruelly ill-treat a Badger, or attempt to do so;
 - interfere with a sett by damaging or destroying it;
 - to obstruct access to, or any entrance of, a Badger sett; or
 - to disturb a Badger when it is occupying a sett.

Bats

- 1.4.3 All species of British bat are listed on *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), and receive full protection under *Section 9*. Protection was extended by the *Countryside and Rights of Way Act 2000* (the CRoW Act). They are also listed as European Protected Species on *Schedule 2* of *The Conservation of Habitats and Species Regulations 2010* which gives them full protection under *Regulation 40(1)*.
- 1.4.4 Under the above legislation it is an offence to intentionally or recklessly:
- kill, injure or take an individual of such a species;
 - possess any part of such species either alive or dead;

- damage, destroy or obstruct access to any place or structure used by such species for shelter, rest, protection or breeding;
- disturb such a species whilst using any place of shelter or protection; or
- sell or attempt to sell any such species.

1.4.5 Several species of bat are included as Priority Species in the UK Biodiversity Action Plan (UK BAP) and also as species of principal importance for the conservation of biological diversity in Wales under *Section 42* of the *Natural Environment and Rural Communities Act 2006* (NERC Act 2006).

1.4.6 All species of British bat are also protected under *Schedule 6* of the *Wildlife and Countryside Act 1981* (as amended). This protection relates specifically to trapping and direct pursuit of the species.

Water Vole and Otter

1.4.7 The Water Vole (*Arvicola amphibius*) is protected under *Section 9* of *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended). This protection was extended by the *CRoW Act 2000*. Under the above legislation it is an offence to intentionally or recklessly:

- damage, destroy or obstruct access to any structure or place that Water Voles use for shelter or protection; or
- disturb a Water Vole while it is using such a place.

1.4.8 Following amendment of this legislation in August 2008 the following offences also apply:

- intentionally kill, injure or take any wild Water Vole;
- possess or control any live or dead wild Water Vole or any part of, or anything derived from, such an animal;
- sell, offer or expose for sale, or have in his possession or transports for the purpose of sale, any live or dead water vole, or any part of, or anything derived from, such an animal; or
- publish or cause to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things.

1.4.9 The Water Vole is also a UK BAP priority species and is included in *Section 42* of the NERC Act 2006 as a species of principal importance for the conservation of biological diversity in Wales.

1.4.10 The Otter (*Lutra lutra*) is listed on *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), and receive full protection under *Section 9*. The 1981 Act was amended by the *Countryside and Rights of Way Act 2000* (the CRoW Act) which further extends the protection. It is also listed on *Annexe IV* of the European Union Directive on Natural Habitats and Wild Fauna and Flora (*Council Directive 92/43/EEC*), which is implemented in the UK by *The Conservation of Habitats and Species Regulations 2010*. It is included on *Schedule 2* of these regulations which gives it full protection under *Regulation 40(1)*. The Otter is therefore a so-called European Protected Species.

1.4.11 Under the above legislation it is an offence to intentionally or recklessly:

- kill, injure or take an individual of such a species;

- possess any part of such species either alive or dead;
- damage, destroy or obstruct access to any place or structure used by such species for shelter, rest, protection or breeding;
- disturb such a species whilst using any place of shelter or protection; or
- sell or attempt to sell any such species.

- 1.4.12 The Otter is also a UK BAP priority species and is included in *Section 42* of the NERC Act 2006 as a species of principal importance for the conservation of biological diversity in Wales.

Great Crested Newts

- 1.4.13 Great Crested Newts are listed on *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), and receive full protection under *Section 9*. The 1981 Act was amended by the *Countryside and Rights of Way Act 2000* (the CRow Act) which further extends the protection. It is also listed on *Annexes II* and *IV* of the European Union Directive on Natural Habitats and Wild Fauna and Flora (*Council Directive 92/43/EEC*), which is implemented in the UK by *The Conservation of Habitats and Species Regulations 2010*. It is included on *Schedule 2* of the Habitats Regulations which gives it full protection under *Regulation 40(1)*. The Great Crested Newt is therefore a so-called European Protected Species. The legislation applies to all life stages of the Great Crested Newt, including eggs, larvae, juveniles and adults.

- 1.4.14 Under the above legislation it is an offence to intentionally or recklessly:
- kill, injure or take an individual of such a species;
 - possess any part of such species either alive or dead;
 - damage, destroy or obstruct access to any place or structure used by such species for shelter, rest, protection or breeding;
 - disturb such a species whilst using any place of shelter or protection; or
 - sell or attempt to sell any such species.

- 1.4.15 The Great Crested Newt is a priority species in the UK Biodiversity Action Plan (UK Biodiversity Steering Group 1995, 1998a & b), which includes objectives and targets to protect and restore newt habitats and to create new sites through habitat management and re-creation. *Section 42* of the *Natural Environment and Rural Communities Act 2006* (NERC Act 2006) provides a list of habitats and species of principal importance for the conservation of biological diversity in Wales. The Great Crested Newt is included on this list. The Great Crested Newt is also identified as a priority species in the Wrexham Biodiversity Action Plan (Wrexham County Borough, 2003). The Wrexham BAP is a supplementary planning guidance document.

Reptiles

- 1.4.16 Viviparous Lizard, Grass Snake, Slow-worm and Adder are all listed under *Schedule 5* of the *Wildlife and Countryside Act 1981* (as amended), in respect of *Section 9(5)* and part of *Section 9(1)*. This protection was extended by the CRow Act.
- 1.4.17 Under the above legislation it is an offence to:
- intentionally or recklessly kill or injure any individual of such a species; or
 - sell or attempt to sell any part of the species alive or dead.

- 1.4.18 All four of the above listed reptiles are UK BAP priority species and are also included in *Section 42* of the *NERC Act 2006*.

Birds

- 1.4.19 All species of bird are protected under *Section 1* of the *Wildlife and Countryside Act 1981* (as amended). The protection was extended by the *Countryside and Rights of Way Act 2000*.
- 1.4.20 The legislation makes it an offence to intentionally or recklessly:
- kill, injure or take any wild bird;
 - take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
 - take or destroy an egg of any wild bird.
- 1.4.21 Certain species of bird are listed on *Schedule 1* of the *Wildlife and Countryside Act 1981* (as amended) and receive protection under *Sections 1(4)* and *1(5)* of the Act. The legislation confers special penalties where the above mentioned offences are committed for any such bird and also make it an offence to intentionally or recklessly:
- disturb any such bird, whilst building its nest or it is in or near a nest containing dependant young; or
 - disturb the dependant young of such a bird.
- 1.4.22 *Section 74(2)* of the *Countryside and Rights of Way Act 2000* (now under *Section 42* of the *Natural Environment and Rural Communities Act 2006*) requires the government to prepare and publish a list of species and habitats that it considers to be of principal importance for the conservation of biological diversity in Wales. This list includes several birds. *Section 74* places a duty on the government to have regard, in exercising all its functions, to conserve biological diversity in accordance with the United Nations Convention on Biodiversity.
- 1.4.23 *Sections 40 to 42* of the *Natural Environment and Rural Communities Act 2006* (NERC Act) replace *S74* of the *CRoW Act*. *Section 40* of the *NERC Act* extends to all public authorities (includes local planning authorities) the existing *S74* duty to have regard to biodiversity as far as is consistent with the proper exercise of their functions.

1.5 Structure of this Report

- 1.5.1 The remainder of this report is structured as follows:

Section 2 describes the methodology;

Section 3 describes the results;

Section 4 presents the evaluation;

Section 5 outlines ecological issues including potential mitigation; and

Section 6 contains the target notes.

Further sections give references and tables of data.

2 METHODOLOGY

2.1 Contextual Information

2.1.1 The limited review of background ecological information involved consulting with both the Countryside Council for Wales (Matthew Ellis, Regional Species and Biodiversity Officer) and Wrexham County Borough Council (Zara Lomax, Ecologist) with regards gathering information on protected species records and statutorily protected sites for nature conservation (within approximately 1 km of the survey site boundary). This provided background information on the ecological status of the site and its surroundings.

2.1.2 In addition widely available contextual information was consulted as follows:

- the National Biodiversity Network Gateway (<http://data.nbn.org.uk/>);
- the MAGIC (Multi-Agency Geographical Information for the Countryside) environmental database (<http://www.magic.gov.uk>);
- UK BAP;
- Wrexham BAP
(http://www.wrexham.gov.uk/english/planning_portal/biodiversity/wxmbap.htm);
- Wrexham LANDMAP
(http://www.wrexham.gov.uk/english/planning_portal/landmap/spg.htm); and
- the Countryside Council for Wales „Protected Sites“ web-site
<http://www.ccw.gov.uk/interactive-maps/protected-areas-map.aspx>.

2.2 Extended Phase 1 Habitat Survey

2.2.1 The Extended Phase 1 Habitat Survey was carried out on 03rd August 2009 by Max Ellison of Marches Ecology. The weather was cloudy, warm and with a moderate breeze. The survey focussed on the land parcel in which the proposed development is to be located, as well as the compensation area (referred to henceforth as the „survey site“, as shown on *Figure 2*). Immediately adjacent habitat was considered where this was possible to view from the site boundary.

2.2.2 The standard initial habitat survey method is Phase 1 Habitat Survey. It involves identifying areas or features of particular interest either in terms of their botanical interest, and/or habitat potential for protected or other notable species.

2.2.3 The Phase 1 Habitat Survey has been adapted in this instance as an „extended“ Phase 1 Habitat Survey, where more information has been obtained to inform site assessment. The methods used centre on the Phase 1 Habitat Survey approach (JNCC 2003) as extended for use in Environmental Impact Assessment (Institute of Environmental Assessment 1995). Extended Phase 1 Habitat Survey is necessarily a more holistic approach than Phase 1 Habitat Survey and provides an understanding of habitat use by faunal groups (IEEM 2005). This involves the following elements:

- Habitat mapping using a set of standard colour codes to indicate habitat types on a Phase 1 Habitat map.

- Description of features of ecological or nature conservation interest in notes relating to numbered locations on the Phase 1 Habitat map, called target notes. Target notes are recorded for habitat and features of possible botanical interest and features relating to animals including protected vertebrates.
- 2.2.4 In addition to the habitat map and target notes, a plant species list was compiled (provided in *Table 12, Section 8*). Plant nomenclature in this report follows Stace (1997).
- 2.2.5 August is a good time of year for general botanical recording, although some early flowering species may no longer be visible. It is unrealistic to suppose that walk-through surveys can generate completely exhaustive species lists at any time of year. It is considered that the list in this report indicates the character of the vegetation and the ecological value of the area inspected.
- 2.2.6 Habitats and other features were assessed for protected and other notable vertebrates that are likely to occur in the region and within the survey area. Evidence of activity was noted when encountered. In addition a subjective assessment of the relative ecological value of the survey area, based on professional experience, was completed. Further information describing the methods employed for particular species where deemed relevant to the site are provided in the following sections. Target notes were made for features of interest, and these are given in *Section 6* and mapped in *Figure 2*.

Badger

- 2.2.7 Areas that might be used by Badger (*Meles meles*) for foraging and sett building were assessed during the Extended Phase I Habitat Survey. Incidental foraging signs, tree scratching, paths, latrines and setts were recorded if found (Harris *et al.*, 1989). The survey site was fully accessed and immediately adjacent land was viewed from within the access boundaries wherever possible.

Bats

- 2.2.8 The survey for bats during the Extended Phase 1 Habitat Survey involved making an assessment of the habitat for foraging, and assessing locations for roosting. No buildings or other built structures occur within the survey site. Trees are briefly described and features that increase the likelihood of them being used for bat-roosting are identified (given as Target Notes in *Section 6*). If any definite signs of bats had been found (such as droppings and feeding remains), they would have been recorded.
- 2.2.9 Where appropriate, a brief external inspection of each tree within the survey site was completed. No ladders or other climbing equipment were used during this inspection. Cracks were not inspected internally and it is therefore possible that bats or evidence of bats could have been overlooked if located out of view. The methodology for the bat assessment was carried out from surveyor experience and followed methodologies adapted from Bat Conservation Trust (2007).

Assessment of Bat-roost Potential - Trees

- 2.2.10 Trees were classified on roosting opportunities for bats, and the general condition of the tree. Potential bat roosting features including any significant cracks, splits, hollows or holes in the trunk or branches, areas of loose bark, and features such as dense *Hedera helix* (Ivy)

cover, or branches that overlap were also recorded. This information enabled each tree to be categorised as follows.

- *High Bat Roost Potential.* Trees with good bat roost potential have numerous or extensive cavities, such as major sections of hollow trunk. They are likely to be used by bats and could be suitable for a maternity roost.
- *Moderate Bat Roost Potential.* Trees with moderate bat roost potential are those with small holes such as woodpecker nest-holes, or cracks. They could be used by individual bats and might be suitable for a maternity roost or other types of roost.
- *Limited Bat Roost Potential.* Trees with limited bat roost potential are those with superficial cracks and holes or small sections of loose bark and/or dense growths of *Hedera helix* (Ivy). They might be used as occasional or transient roosts, but are unlikely to be suitable for large colonies.
- *No Bat Roost Potential.* Trees with no bat roosting potential are those with no holes or cracks, often young trees in good condition. This category was used to identify and discount features or locations of a type which can in some cases potentially be suitable for roosting bats.

Water Vole and Otter

2.2.11 Watercourses/ water bodies were assessed for their suitability for Water Vole (*Arvicola amphibius*) during the Extended Phase 1 Habitat Survey. The assessment method was adapted from that described in Strachan & Moorhouse (2006) as recommended by IEEM (2005), and JNCC (2004). The key environmental factors are as follows:

- water level regime;
- channel management regime;
- bank material/ substrate;
- availability of food (year-round);
- channel dimensions;
- predation (presence of Mink *Mustela vison* and possibly domestic cats);
- bank-side/ emergent vegetation and cover (cover should usually be at least 60%);
- level of disturbance;
- size and continuity of habitat;
- livestock access;
- water quality; and
- competition (particularly the presence of Brown Rat *Rattus norvegicus*).

2.2.12 The habitat within the site was assessed for its suitability for Otter (*Lutra lutra*) during the Extended Phase 1 Habitat Survey. A similar assessment [to that used for Water Vole] was used to determine the potential value of the habitat for Otter (*Lutra lutra*).

Great Crested Newt

Habitat Assessment

2.2.13 The quality of terrestrial and aquatic habitat for Great Crested Newt (*Triturus cristatus*) was assessed during the Extended Phase 1 Habitat Survey. The assessment of aquatic habitat was based on the Habitat Suitability Index (Oldham, *et al.* 2000) that identifies several

criteria that influence the suitability of ponds for Great Crested Newts. These criteria are as follows:

- Geographic location;
- Pond area (Dimensions);
- Pond permanence (Will it dry out?);
- Water quality (Clarity, eutrophic status and substrate);
- Pond shading (Percentage of the pond that is shaded);
- Presence of wildfowl and/ or fish;
- Pond density/ isolation (Is the pond isolated or near other water bodies?);
- Surrounding terrestrial habitat ("newt friendly habitat");
- Macrophyte content (Including marginal and aquatic vegetation); and
- Barriers to the proposed works (Major roads, rivers, large expanses of developed land).

Reptiles

Habitat Assessment

- 2.2.14 The Extended Phase 1 Habitat Survey concentrated on qualitative assessment of the habitat for reptiles. The survey involved identifying areas that are suitable for reptiles; potential basking areas, hibernation sites and foraging habitat. English Nature (2004) provides further information on the distribution and ecology of the four widespread species. Habitat requirements differ between species but can be summarised as follows after Beebee & Griffiths (2000):

- Viviparous Lizards (*Zootoca vivipara*) use a variety of habitats from woodland glades to walls and pastures, although one of their favoured habitats is rough grassland.
- Slow-worms (*Anguis fragilis*) use similar habitats to Viviparous Lizards, and are often found in rough grassland, gardens and derelict land.
- Grass Snakes (*Natrix natrix*) have broadly similar requirements to Viviparous Lizards with a greater reliance on ponds and wetlands for their food source.
- Adders (*Vipera berus*) use a range of fairly open habitats with some cover, but are most often found in dry heath.

Birds

- 2.2.15 The habitat within the survey site was assessed for its potential value for breeding birds during the Extended Phase 1 Habitat Survey.

2.3 Detailed Surveys

Introduction

- 2.3.1 Further to the Extended Phase 1 Habitat Survey and ecological data review, consultation was sought with Wrexham County Borough Council (Emma Broad, Biodiversity Officer) and the Countryside Council for Wales (Matthew Ellis, Regional Species and Biodiversity Officer) in order to agree the scope of detailed surveys. The following detailed survey requirements were identified:

- an Otter (*Lutra lutra*) and Water Vole (*Arvicola amphibius*) survey;
- a reptile presence/ absence survey; and
- a Great Crested Newt (*Triturus cristatus*) presence/ absence survey.

- 2.3.2 The Otter and Water Vole survey was undertaken by Max Ellson of Marches Ecology on 08th June 2010. The reptile presence/ absence survey was undertaken between the 3rd May and 11th June 2010 by Max Ellson and Tom Knight of Marches Ecology. The Great Crested Newt presence/ absence survey was undertaken between 26th April and 10th May 2010 by Max Ellson and Tom Knight.

Water Vole and Otter Survey

- 2.3.3 A detailed survey visit for signs of Water Vole and Otter activity was undertaken of the ditch at *Target Note 4 (Figure 2)*. The survey focused on the ditch corridor within the survey site, and was also extended approximately 50 m upstream (it being culverted to the south). A small ditch that joins this ditch at *Target Note 4* from the west was also surveyed to a distance of approximately 50 m. For the Otter survey, a single spot-check was also undertaken where the ditch meets a minor road, approximately 260 m to the north of the survey site boundary (approximate OS Grid Ref. SJ 372 497).
- 2.3.4 The Water Vole survey method was adapted from that described in Strachan and Moorhouse (2006) as recommended by IEEM (2005), and JNCC (2004). All vegetation within 2 m of the bank-top is searched for signs of Water Vole activity including sightings, latrines, feeding remains and platforms, paths and footprints, burrows and above-ground nests. All of this information is recorded on a standard survey form (Strachan & Moorhouse 2006). In addition the habitat was assessed to determine its potential suitability for Water Voles; the key environmental factors are outlined above in *paragraph 2.2.12*. Mid-April to September is the optimal period for finding Water Vole breeding territories which are marked by latrines (Strachan & Moorhouse 2006).
- 2.3.5 Survey for Otter comprised recording the positions and densities of spraints, holts, couches, and other field signs, where present. The survey methodology broadly followed that outlined in NRA (1993) as recommended by IEEM (2005), JNCC (2004), and Chanin (2003). There is no substantive guidance on Otter survey effort (apart from for Environmental Impact Assessment level projects). One visit at an appropriate time of year was considered suitable for this project, particularly taking into account the nature of the proposed development (discussed in *Section 5*). May to September is the key survey period for Otter.

Great Crested Newt presence/ absence survey

- 2.3.6 Normally survey for Great Crested Newts in relation to a development proposal is extended to include all potentially suitable waterbodies within 500 m of the site boundary. The detailed presence/ absence survey comprised four survey visits to each waterbody identified within 500 m between 26th April and 10th May 2010. The presence/ absence survey was conducted in accordance with the CCW Level III methodology detailed in the Great Crested Newt Guidance Note Number 7 (Version 2002/1). Level III survey requires a standardised torch and/or bottle trap survey in suitable weather conditions.
- 2.3.7 During each of the survey visits a combination of the following three survey techniques was employed:
- Egg search – conducted at each waterbody on each of the survey visits unless a Great Crested Newt egg is found. Egg searches involve the careful inspection of marginal plants for newt eggs that are laid on suitable leaves, with the leaf subsequently folded over the egg. If an egg is found the remaining survey visits may not be needed unless a population assessment is required.

- Torch surveys – conducted at each waterbody on each of the survey visits using a 1.5 million candlelight power clu-lite torch. This involves shining the torch into the waterbodies at night when newts are most active and therefore more visible.
- Bottle-trapping – involves the setting of funnel-traps (2-litre plastic bottles with the tops inverted) into the pond margins. The traps are usually set during the evening of one survey visit and have to be collected early the following morning. Under the CCW survey licence, restrictions are placed on how long these traps are left in place principally for welfare considerations. This technique is particularly useful in weed-filled ponds or where visibility is otherwise poor.

2.3.8 The presence/ absence survey was conducted by Tom Knight and Max Ellson who hold current Countryside Council for Wales (CCW) Great Crested Newt „survey/disturbance“ licences (Tom Knight No. OTH:SA:213:2008 and Max Ellson No. 20679:OTH:SA:2010).

2.3.9 Further to the completion of the presence/ absence survey, Great Crested Newt eggs were located in a ditch approximately 80 m to the north of the survey site boundary; this ditch had not been subject to detailed survey in this location. Following consultation with Emma Broad and Matthew Ellis it was determined that no further detailed survey would be required in this instance.

Reptile presence/ absence survey

2.3.10 Although reptiles are largely active between March and October, the best survey months tend to be April to June and September. The reptile presence/ absence survey was initiated in May 2010, with visits also undertaken in early June. Refugia were installed as outlined in *paragraph 2.3.11* below; these were then re-visited during the survey period in order to record any reptiles found. When walking between refuges the surveyor also noted down any reptiles seen as some species do not use refuges as readily as others. Froglife (1999) suggests that at least seven visits in suitable weather conditions are required, although ten visits were undertaken on this occasion to ensure a robust survey effort.

2.3.11 Froglife (1999) indicates that for general survey purposes five to ten refuges per hectare is adequate, although the number used during this survey was higher to give a better chance of recording reptiles if present. A total of fifty artificial refugia (a combination of 0.5 m² pieces of roofing felt and corrugated metal sheets) were deployed around the survey site. Survey effort concentrated on potentially valuable habitat or other features for reptiles identified during the Extended Phase 1 Habitat Survey.

2.4 Site Evaluation

2.4.1 The ecological value of habitats and/or species is often assessed according to a number of widely used criteria of which perhaps the most frequently used are naturalness, extent, rarity, and diversity. For the purpose of this report the ecological value of the habitat and species present on the site has been determined using the approach detailed in IEEM 2006 (paragraphs 3.20 to 3.42 and 3.52 to 3.55). Broadly speaking habitat value should be obtained by using published, ideally local, site selection criteria and legal or in some instances conservation status. The ecological value of a species considers its distribution and legal or conservation status, the latter is mostly due to inherent rarity.

2.4.2 Significant species were defined as follows:

- species protected by the *Wildlife and Countryside Act 1981 (as amended)*;
- species protected by European directives;
- species listed in *Section 42* of the *NERC Act 2006*;
- red data book species; and
- other species listed as scarce or notable in literature issued by conservation organisations or learned societies.

2.4.3 Biodiversity Action Plans and lists of declining species (e.g. The of Birds of Conservation Concern: Eaton *et al.*, 2009) have been used only where there is insufficient information to identify local status and can only provide indicative value. Such Action Plans and lists are more important for guiding proposals for habitat creation/enhancement.

3 RESULTS

3.1 Contextual Information

Statutory and Non-statutory Designated Sites

- 3.1.1 There are no statutory designated sites within 1 km of the survey site. There are two Wildlife Sites (WS) within the 1 km search area (refer to *Figure 3* and *Table 1* below). The summary descriptions in *Table 1* are adapted from information supplied by Wrexham County Borough Council.

Table 1 – Non-statutory Designated Sites

Site name and reference	Grid Reference	Approximate distance from site boundary	Summary Description
Cefn Park (W316)	SJ362 500	300 m	Two broad-leaved woodlands within Cefn Park. Big Wood is the largest and is dominated by ash, oak, sycamore and occasional mature wych elm. There is a rich ground flora including dog's mercury, bluebell, wood anemone and ramsons.
Erlas Black Wood, part of Wrexham Industrial Estate (W337)	SJ377 500	750 m	Ancient broad-leaved woodland, dominated by mature oak.

- 3.1.2 The criteria used to select Wildlife Sites in Wrexham County Borough have been developed in conjunction with North Wales Wildlife Trust, Countryside Council for Wales and other local authorities. WCBC identify Wildlife Sites as follows:

‘areas of substantive value including both the most important and most distinctive species, habitats, geological and geomorphological features within a national, regional and local context’.

Species

- 3.1.3 Matthew Ellis of Countryside Council for Wales (CCW) provided a plan indicating locations of protected species records within the general locality of the survey site; only those within approximately 1 km are outlined below. Locations of records for Badger, bats (no specific species) and Great Crested Newt were provided; these did not include dates or other details (e.g. type of record, date, number of animals, etc). In summary, there are records for the following:

- Badger – one record in Big Wood, located approximately 680 m to the north of the survey site.
- Bats – four records, the nearest of which is located approximately 580 m to the east of the survey site.
- Great Crested Newt – eight records. Further information was requested for the only record within 500 m of the survey site. This revealed that the record was a 1992 egg-search record for „Pear Tree Cottage“ (OS Grid Ref. 336988 349540). The location on the map provided (replicated on *Figure 4*) appears to indicate that the record is from the

ditch to the immediate north of the survey site; however Pear Tree Cottage itself is located approximately 130 m to the north of the boundary.

3.1.4 Information supplied by Zara Lomax of WCBC broadly tallied with that provided by CCW.

3.1.5 A review of species records on the NBN website for the wider area provided the following additional records:

- A large number of records for various bat species from the SJ34 10-km square (within which the survey site is located) including a record for Whiskered bat (*Myotis mystacinus*) for SJ3749 (the same grid square in which the survey site is located) and a record for Whiskered Bat, *Chiroptera* sp. and *Pipistrellus* sp. from immediately adjacent 1 km grid squares.
- A large number of records for Great Crested Newt from the SJ34 10-km square predominantly to the east and south of the survey site.
- A record for both Slow-worm and Adder from SJ3849 (Wrexham Industrial Estate), dated 1999. This is located within an adjacent 1 km grid square to the survey site.

3.1.6 In addition to the above, Biota (2007) recorded Great Crested Newts from land immediately north of the survey site (OS Grid Ref. 337106, 349509, approximately 70 m from the survey site boundary) on two occasions during surveys in 2007. A maximum of three Great Crested Newts were recorded (during terrestrial searches), as well as eight Smooth Newt.

3.2 Wrexham Biodiversity Action Plan

3.2.1 Two habitats identified as priority habitats in the Wrexham Biodiversity Action Plan (WBAP¹) are of potential relevance to the survey site – Derelict/ Industrial Land and River, Stream and Canal. The WBAP states that 22 UK priority species were selected for Wrexham County Borough of which seven currently have Species Action Plans (SAPs). Those of potential relevance to the survey site include Badger, Otter, Great Crested Newt, Barn Owl and Song Thrush. The WBAP also includes a „Provisional List of Locally Important/Endangered Species“.

3.3 Extended Phase 1 Habitat Survey

Site Description

3.3.1 The survey site is located immediately adjacent to Clywedog Road South and extends to approximately 2.42 hectares. It is located approximately 3.6 km to the east of Wrexham town centre. Wrexham *Landmap* identifies the survey site as being on the boundary of character area 11: Wrexham Industrial Estate. This extensive area is characterised by mixed manufacturing and business uses. The western part of the Industrial Estate (where the survey site is located) is within an undulating landscape, with a resemblance to the Welsh Maelor topography. Species-rich grassland and scrub and wetland habitats are noted as a feature of this area. It also describes „small watercourses, ditches, and ponds“ as being „frequent, providing good habitats for water voles, great crested newts and other aquatic species“.

¹ http://www.wrexham.gov.uk/english/planning_portal/biodiversity/wxmbap.htm

- 3.3.2 The survey site is bounded on all sides by either post-and-wire or palisade fences. Immediately to the north, the site is bordered by an area of species-rich neutral grassland with stands of tall-herbs within the grounds of an industrial unit. To the east the site is bounded by Clywedog Road South and further to the east a range of industrial premises with largely highly managed grounds. To the southeast of the site (west of Pentre Maelor housing estate) there is a further large area of species-rich neutral grassland and tall-herb vegetation. Malpas Tractors is located directly to the south of the site; this unit comprises a single building with the remaining area characterised by hard-standing. To the west the site is bordered by open countryside of agriculturally improved pastures and arable fields. This farmland is identified as a „Green Barrier“ in the Wrexham Unitary Development Plan². These fields are mostly bounded by hedges/ lines of trees often with associated ditches.

Habitat and Flora

The Survey Site

- 3.3.3 The survey site is dominated by open ground supporting species-rich neutral grassland/ tall-herb vegetation. The Extended Phase 1 Habitat map is provided as *Figure 2*. Habitat types recorded within the survey site are as follows:

- Neutral grassland (with associated tall-herb vegetation);
- Continuous and scattered scrub/trees; and
- A ditch/ stream.

Neutral Grassland and Tall-herb Vegetation

- 3.3.4 The neutral grassland resource is described at *Target Note 1* (refer to photos below). It appears to have developed on relatively recently cleared land (possibly in the last 10-20 years); there is evidence of parallel „furrow“ lines. The substrate appears to be dominated by clay material and although surface water was limited to occasional deeper furrows, the site is known to support extensive surface water after periods of heavy rain. Broadly, much of the grassland resource is similar in structure and composition, being species-rich and with an approximate average sward height of between 0.5 and 0.75 m. It is unmanaged and could be described as rank; despite this the grassland is (overall) species-rich.



²http://www.planningportal.gov.uk/wps/portal/genpub_DevelopmentPlans?docRef=DEVPlans&scope=202&langid=0

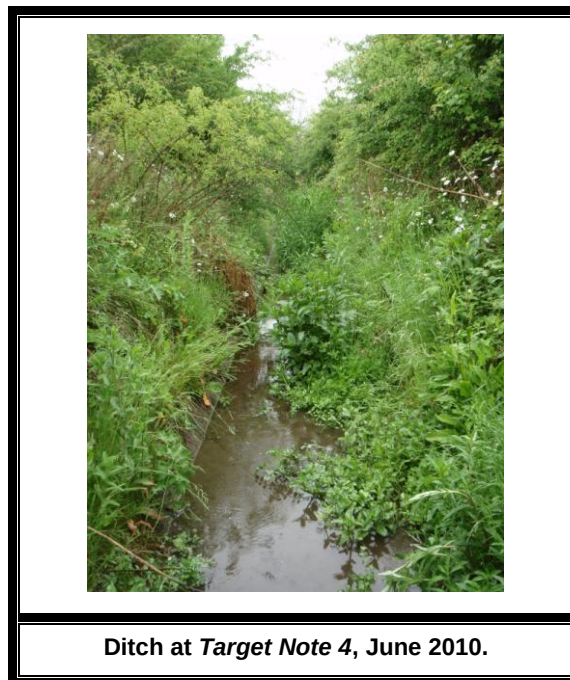
- 3.3.5 The sward is characterised by frequent/ locally abundant *Deschampsia cespitosa* (Tufted Hair-grass) and *Carex nigra* (Common Sedge) with frequent *Holcus lanatus* (Yorkshire-fog). Tussocks of *Juncus inflexus* (Hard Rush) and *Carex otrubae* (False-fox Sedge) are locally frequent. A range of other grasses and sedges are scattered throughout. A wide range of tall-herbs and lower growing forbs occur throughout the sward. *Centaurea nigra* (Common Knapweed) and *Ranunculus repens* (Creeping Buttercup) are abundant, with *Lathyrus nissolia* (Grass Vetchling), *Pulicaria dysenterica* (Common Fleabane), *Potentilla reptans* (Creeping Cinquefoil) and *Torilis nodosa* (Upright Hedge-parsley) being locally frequent to abundant. Notable other species include frequent *Senecio erucifolius* (Hoary Ragwort), occasional to locally frequent *Dactylorhiza fuchsii* (Common Spotted-orchid) and *Silene silaus* (Pepper-saxifrage) and very occasional *Picris echioides* (Bristly Ox-tongue) and *Lactuca serriola* (Prickly Lettuce).
- 3.3.6 Small stands of tall-herbs are scattered throughout [too small to map on Figure 2] although a larger stand is located at Target Note 1a. Here *Epilobium hirsutum* (Great Willowherb) dominates with locally abundant *Deschampsia cespitosa* (Tufted Hair-grass) and frequent *Juncus inflexus* (Hard Rush), *Cirsium vulgare* (Spear Thistle), *Scrophularia nodosa* (Common Figwort), *Rumex conglomeratus* (Clustered Dock) and *Cardamine pratense* (Cuckooflower). There are also scattered small stands of *Typha latifolia* (Bulrush). Very locally, the grassland could be considered to be marshy grassland (for example at Target Note 1b and in the north-western corner of the site where *Juncus inflexus* (Hard Rush) dominates with frequent *Pulicaria dysenterica* (Common Fleabane) and *Achillea ptarmica* (Sneezewort), and locally *Mentha aquatica* (Water Mint).

Scrub/ trees

- 3.3.7 At Target Note 3, a narrow band of scrub/ scrub-woodland is located on the western boundary of the survey site. It is approximately 10 m across at its widest point and is partly located on a slight slope up to the boundary fence. This feature has largely been planted; planting stakes are still evident. Trees and shrubs present include abundant *Prunus cerasifera* (Cherry-plum) and occasional *Malus domestica* agg. (Apple), *Quercus robur* (Pedunculate Oak), *Fraxinus excelsior* (Ash) and *Crataegus monogyna* (Hawthorn). The associated field layer is mostly grass dominated and species-poor, although a few plants of the notable species *Ophioglossum vulgatum* (Common Adder's-Tongue) were recorded.
- 3.3.8 Scrub is also associated with the banks of a ditch/ stream (described at Target Note 4) located on the western boundary of the survey site. The eastern bank supports a narrow band of dense scrub dominated by *Crataegus monogyna* (Hawthorn) with associates including locally dominant *Rubus fruticosus* agg. (Bramble) and occasional *Rosa canina* agg. (Dog-rose), *Salix cinerea* (Grey Willow) and young *Quercus robur* (Pedunculate Oak) saplings. The western bank (and a narrow band of adjacent land between the ditch and a boundary fence) mostly supports dense scrub/ scrub-woodland. Both *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) are abundant with associates including locally frequent *Quercus robur* (Pedunculate Oak), with *Malus domestica* agg. (Apple), *Fraxinus excelsior* (Ash), *Salix fragilis* (Crack Willow) and *Rosa arvensis* (Field-Rose).
- 3.3.9 There is scattered young scrub across the neutral grassland (described at Target Note 1); mostly individual shrubs of *Salix cinerea* (Grey Willow), *Rosa canina* agg. (Dog-rose) and *Crataegus monogyna* (Hawthorn), and locally incipient *Rubus fruticosus* agg. (Bramble).

Ditch/ Stream

- 3.3.10 A short section of ditch/ stream (*Target Note 4*) is located adjacent to part of the western boundary of the survey site (refer to photo below). It runs in a southerly direction from the north-west corner for approximately 100 m, before entering into a culvert. It is approximately 1.5 m wide at water level and a maximum of 0.2 m deep, over a silty substrate. Much of the channel has a concrete bed and banks to a height of approximately 1.5 m. It has a slow to moderate flow. The majority is heavily shaded by overhanging trees/ shrubs; here in-channel vegetation appears limited to the floating-leaved *Lemna minor* (Common Duckweed) and occasional marginal plants. In more open areas the channel is characterised by abundant *Apium nodiflorum* (Fool's Water-cress).



Adjacent Land

- 3.3.11 As outlined in *paragraph 3.3.2* above, an area of species-rich neutral grassland with stands of tall-herbs is located within the grounds of an industrial unit to the immediate north of the survey site (*Target Note 6*). There is also a narrow band of young mixed plantation woodland on a man-made embankment in this area (*Target Note 7*). The ditch at *Target Note 4* continues to the north of the survey site.

Fauna

Badger

- 3.3.12 No setts were recorded within the survey site. Opportunities for sett construction are limited to the denser areas of scrub located along the western boundary, including that associated with the banks of the ditch/ stream (*Target Note 4*) and dense scrub on a shallow slope at *Target Note 3*. Access to much of the dense scrub vegetation was restricted due to its impenetrable nature; it is possible that a sett may have been obscured within such vegetation. Opportunities also occur on immediately adjacent land, including the area of plantation/ scrub to the immediate north of the survey site (*Target Note 7*) and potentially associated with the base of hedges that bound agricultural fields to the immediate west.

- 3.3.13 Signs of Badger activity within the survey site were restricted to three breach points and two paths. A moderately used Badger path crosses the site from a breach at the southwest corner, passing through the middle of the site and exiting/ entering along the northern boundary (*Target Note 2a*). A further well-used breach was recorded in the northwest corner at *Target Note 5*. The associated short length of path disappears into dense scrub within the site; it is possible, as outlined above, that a sett may have been obscured within this vegetation. Although no signs of foraging were observed within the survey site, it is possible that Badgers may utilise it for this purpose; for example there are some *Malus domestica* agg. (Apple) trees and other fruit trees that they may take fallen fruit from. Generally the grassland and tall-herb vegetation is likely to provide a low quality foraging resource. The agricultural land to the west provides better opportunities; evidence of foraging was noted on the edge of an arable field at *Target Note 2c*.

Bats

- 3.3.14 There are no buildings, or other built structures, within the survey site. There are also no individual standard trees other than those associated with the scrub/ scrub-woodland resource described at *Target Notes 3 and 4*. At *Target Note 3*, the largest trees are approximately 12 m tall with diameters at breast height (dbh"s) of 0.3 m. Similarly, the largest trees at *Target Note 4* are approximately 10 m tall with dbh"s of 0.3 m. These trees are too young/ small to be of any potential value for roosting bats.
- 3.3.15 The dominant habitat type within the survey site; neutral grassland/ tall-herbs may be of some value for foraging bats; depending on the invertebrate resource present. The ditch/ stream corridor and associated scrub along the western boundary (*Target Notes 3 and 4*) could potentially be utilised by bat species that favour such linear features for foraging/ commuting.

Water Vole and Otter

- 3.3.16 The short-section of ditch/ stream at *Target Note 4* provides potential, though sub-optimal quality, habitat for Water Voles. It provides suitable vegetative cover, a food resource, and the potential for animals to burrow into the earth banks above the concrete reinforcement. No signs of Water Vole were recorded (during the Extended Phase 1 Habitat Survey) although a thorough and systematic survey was not undertaken. The ditch/ stream appears to be culverted for approximately 150 m to the south of where it enters a culvert on the survey site. It also extends to the west and north of the survey site. To the west it extends into agricultural land whilst to the north it passes along the boundary of the Industrial Estate, often in culverted sections.
- 3.3.17 Otters could potentially include the ditch/ stream within their territory. The dense vegetation along parts of the ditch corridor provides potential areas for transient couches (or resting places) and also possibly for breeding. If the ditch/ stream is utilised, it is only likely to be used infrequently by dispersing animals or individuals commuting between different parts of a territory. No signs of Otter were recorded (during the Extended Phase 1 Habitat Survey) although a thorough and systematic survey was not undertaken.

Great Crested Newt

- 3.3.18 Aquatic habitat within the survey site is limited to the short section of ditch described at *Target Note 4*. This has a slow to moderate flow and is considered unlikely to provide

suitable conditions for breeding [for Great Crested Newts]. It could potentially provide suitable aquatic habitat for foraging.

- 3.3.19 The terrestrial habitat that characterises the survey site (grassland/ tall-herb vegetation and scrub) is considered to provide potential high quality terrestrial habitat (foraging/ dispersal/ hibernation) for Great Crested Newts. The ditch/ scrub corridor on the western boundary may be of particular value for dispersal.

Reptiles

- 3.3.20 The habitat within the survey site (unmanaged grassland with stands of tall-herbs and associated scrub edges) is potentially suitable for all four widespread reptile species but in particular Slow-worm, Viviparous Lizard and Grass Snake. The short section of ditch/ stream corridor may be of particular value for Grass Snake; this species is known to have a large home range and often travels along watercourses. The survey site is linked to suitable grassland habitat immediately to the north and is located within approximately 80 m of a further large area of species-rich neutral grassland and tall-herb vegetation (located to the west of Pentre Maelor housing estate); it is therefore not an isolated ecological unit.

Birds

- 3.3.21 Potential nesting opportunities within the survey site are mainly limited to the scrub resource located adjacent to the western boundary (*Target Note 3 and 4*). The grassland may also be suitable for a few ground-nesting species e.g. Meadow Pipit (*Anthus pratensis*).

Other Species

- 3.3.22 A number of plots of land within Wrexham Industrial Estate are known to support two butterfly species of conservation interest: Grizzled Skipper (*Pyrgus malvae*) and Dingy Skipper (*Erynnis tages*). The survey site is not thought to provide suitable habitat for Grizzled Skipper.
- 3.3.23 A single Dingy Skipper was recorded whilst undertaking detailed surveys for other species on both the 2nd and 4th June 2010. However the survey site is not thought to provide much suitable habitat as the vast majority of the grassland is tall and rank. There is no short grassland with potential larval food-plants over bare substrate. Typically on the Industrial Estate the larval host-plant of this species is *Lotus corniculatus* (Common Bird's-foot-trefoil). Although Common Bird's-foot-trefoil is occasional on the survey site it is generally located within tall grassland. The area of land to the north of the survey site that supports species-rich grassland of variable heights is considered to provide potentially suitable habitat (though access was not gained to confirm the presence of the key plant species).

3.4 Detailed Surveys

Water Vole and Otter Survey

- 3.4.1 No signs of Water Vole were recorded during the detailed survey. No signs of Otter were recorded either, including at the spot-check location.

Great Crested Newt Presence/ Absence Survey

Introduction

- 3.4.2 An initial review of the OS map 1:25, 000 scale indicated that there are nine waterbodies (other than ditches and streams) within approximately 500 m of the survey site (*Figure 4*). A walkover survey undertaken by Marches Ecology in the area as part of a previous, but unrelated, commission in December 2008 identified that five of the nine ponds identified from desk-based sources (Waterbodies 1-4 and 6 on *Figure 4*) are no-longer present. Two of the remaining four waterbodies (Waterbodies 5 and 9) were observed during the walkover survey. Waterbodies 8 and 10a were believed to be present. One further waterbody is also known to occur within 500 m; Waterbody 7 on *Figure 4*.
- 3.4.3 As such four survey visits to all six waterbodies (Waterbodies 5, 7, 8, 9, 10a and a ditch at number 11, *Figure 4*) previously identified as being located within 500 m of the survey site boundary were completed in April/ May 2010. During the first visit a seventh waterbody (Waterbody 10b) was located in the same field unit as number 10a and was therefore included in the survey. As Cofnod and CCW provided a Great Crested Newt record believed to be from Pear Tree Cottage enquiries were made at this house to ascertain whether a pond is present at this location and whether it would be possible to include this pond in the survey. The land-owner confirmed that there is a pond present but denied access for survey. He confirmed that the pond had been stocked with fish in the past.
- 3.4.4 The results of the survey visits are presented in *Tables 2* (waterbody descriptions), 3 (weather conditions) and 4 to 10 (survey results) below. Bottle traps were set on the evening of the date recorded and checked early the following morning. The number given in brackets in the bottle trapping column in *Tables 4* to *10* indicates the number of traps deployed at each waterbody on each visit.

Waterbody Descriptions

- 3.4.5 Each waterbody was visited on the 27th April 2010. *Table 2* below provides a brief description compiled on that date as well as approximate distances from the survey site boundary; Waterbodies 7, 9 and 11 are located within 250 m of the survey site boundary and Waterbodies 5, 8, 10a and 10b within 250 to 500 m.

Table 2 – Waterbody Descriptions

Waterbody no.	OS Grid Reference	Approx. distance from survey site boundary	Description
Waterbodies within 0 to 250 m of survey site boundary			
11	336966, 349464	0 m	Ditch. It is approximately 1.5 m wide at water level and approximately 0.2 m deep, over a silty substrate. Much of the channel has a concrete bed and banks to a height of approximately 1.5 m. It has a slow to moderate flow although in places accumulations of leaf litter and over-hanging vegetation reduce the flow-rate. The majority is heavily shaded by overhanging trees/ shrubs; here in-channel vegetation appears limited to the floating-leaved <i>Lemna minor</i> (Common Duckweed) and occasional marginal plants. In more open areas the channel is characterised by abundant <i>Apium nodiflorum</i> (Fool's Water-cress) with locally frequent <i>Epilobium hirsutum</i> (Great Willowherb) and lesser amounts of both <i>Mentha aquatica</i> (Water Mint) and <i>Veronica beccabunga</i> (Brooklime). The banks extend to approximately 2 m above the water level being of earth material above the concrete reinforcement; they are steep at approximately 60°.
9	336843, 349264	107 m	A circular pond that is approximately 20 m wide. Approximately 75% of the margin is shaded by adjacent <i>Quercus robur</i> (Pedunculate Oak) trees and shrubs. The southern margin is open; where marginal vegetation is present it is well browsed by livestock/ geese (although much of the pond is fenced). Marginal vegetation includes locally frequent <i>Juncus effusus</i> (Soft-rush), <i>Solanum dulcamara</i> (Bittersweet), <i>Agrostis stolonifera</i> (Creeping Bent) with lesser amounts of <i>Sparganium erectum</i> (Branched Bur-reed), <i>Glyceria fluitans</i> (Floating Sweet-grass) and <i>Lycopus europaeus</i> (Gypsywort). The water quality may be poor and may have been subject to eutrophication. Fish may be present. The immediate bankside vegetation to the north, east and west is characterised by rank grassland, tall herbs, trees, shrubs and a hedge. To the south there is an improved grassland field. The banks consist of earth and extend to up to 1.5 m above the water level.
7	336806, 349540	166 m	A pond in the garden of Llwyn Aben. It is largely shallow (0.1 to 0.4 m) and apparently dries out in the summer. It receives run-off from the adjacent road. It measures approximately 35 m by 6-10 m. Most of the pond is heavily used/ browsed by domestic wildfowl and much of the marginal vegetation is browsed/ trampled. In places the margins include locally frequent blanketweed, <i>Phalaris arundinacea</i> (Reed Canary-grass), <i>Agrostis stolonifera</i> (Creeping Bent), <i>Typha latifolia</i> (Bulrush), <i>Carex</i> sp. (A Sedge), <i>Solanum dulcamara</i> (Bittersweet) and <i>Glyceria fluitans</i> (Floating Sweet-grass) with lesser amounts of <i>Galium palustre</i> (Common Marsh-bedstraw) and <i>Apium nodiflorum</i> (Fool's Water-cress). The margins are mostly open although approximately 50% is

Waterbody no.	OS Grid Reference	Approx. distance from survey site boundary	Description
			shaded by adjacent trees/ shrubs. The water is relatively clear and there are no fish present. The banks are characterised by amenity grassland with trees/ shrubs.
Waterbodies within 250 to 500 m of survey site boundary			
10a	336874, 349023	310 m	A shallow depression in an improved grassland field that measures approximately 15 m by 5-6 m. The earth banks extend to approximately 0.5 m above water level at 15-30°. Water depth extends to no more than 0.25 m. It is open to livestock and has been trampled throughout. It is also used by wildfowl. The margins are dominated by <i>Juncus effusus</i> (Soft-rush) with <i>Ranunculus repens</i> (Creeping Buttercup), <i>Agrostis stolonifera</i> (Creeping Bent) and <i>Glyceria fluitans</i> (Floating Sweet-grass). The surface is dominated by <i>Glyceria fluitans</i> (Floating Sweet-grass) with locally frequent <i>Myosotis scorpioides</i> (Water Forget-me-not), <i>Cardamine pratensis</i> (Cuckooflower) and lesser amounts of <i>Ranunculus sceleratus</i> (Celery-leaved Buttercup), <i>Veronica beccabunga</i> (Brooklime), <i>Lemna minor</i> (Common Duckweed), <i>Galium palustre</i> (Common Marsh-bedstraw), <i>Carex</i> sp. (A Sedge), <i>Juncus acutiflorus</i> (Sharp-flowered Rush), <i>Alisma plantago-aquatica</i> (Water-plantain), <i>Apium nodiflorum</i> (Fool's Water-cress), <i>Ranunculus</i> sp. (A Water-crowfoot) and <i>Callitriche stagnalis</i> (Common Water-starwort).
5	336632, 349507	325 m	A pond (by Blue Cottage) that is roughly oval in shape and measures approximately 20 m by 15 m. The depth is unknown. A short stretch along the northern margin is partially open but otherwise the margins support <i>Salix cinerea</i> (Grey Willow) which extends out across most of the surface. Access to the water's edge was therefore difficult other than along the northern margin. No aquatic or marginal vegetation was visible at the time of the survey and as such no potential egg-laying plants are present. It is possible that the water quality is poor. Much of the banks are constructed of tipped rubble and other tipped debris is present in the pond. No fish were observed during the survey. A Moorhen (<i>Gallinula chloropus</i>) nest was recorded and the pond was utilised by a small number of ducks.
8	336617, 349130	383 m	This pond is more-or-less circular in shape and measures approximately 20-25 m across. It is located in an improved grassland field. The depth is unknown although there is a significant depth of silt/ leaf litter in the margins. The general water quality is not known although the water was turbid throughout the survey period. The margins are heavily trampled by livestock. No aquatic vegetation was visible at the time of survey. There is virtually no marginal vegetation other than small patches of <i>Agrostis stolonifera</i> (Creeping Bent) and <i>Glyceria fluitans</i> (Floating Sweet-grass) with a small amount of <i>Juncus effusus</i> (Soft-rush). The banks extend to approximately 0.3-1.5 m above the water level with a

Waterbody no.	OS Grid Reference	Approx. distance from survey site boundary	Description
			slope of 30-60°. The western bank is bordered by <i>Quercus robur</i> (Pedunculate Oak) trees with <i>Crataegus monogyna</i> (Hawthorn). As such approximately 40-50% of the pond margin is shaded. This pond is heavily used by waterfowl including Canada Geese (<i>Branta canadensis</i>). A floating „duck platform“ is present.
10b	336793, 348978	385 m	A shallow depression in the same field as Waterbody 10a. It measures approximately 15 m by 7 m and 0.2 m deep but is otherwise similar to Waterbody 10a.

Weather Conditions

- 3.4.6 The weather was suitable for torch survey on all survey dates. The weather conditions are summarised in the following table.

Table 3 – Weather Conditions

Visit	Date	Temperature at dusk	Wind (Beaufort scale)	General weather conditions
1	26.04.10	11.1 °C	0-1.	Dry, partly cloudy.
2	28.04.10	14.7 °C	0-1	Dry, cloudy.
3	04.05.10	9-10 °C	1-2.	Partly cloudy, dry.
4	10.05.10	8 °C	0-1	Dry and clear.

Survey Results

Table 4 – Survey Results for Visits to Waterbody 5

Visit	Date	Egg search	Torching	Bottle trapping (5 traps)
1	26.04.10	Nil	No amphibians.	No amphibians.
2	28.04.10	Nil	No amphibians.	No amphibians.
3	04.05.10	Nil	No amphibians.	No further bottle trapping undertaken.
4	10.05.10	Nil	No amphibians.	
Maximum count: No amphibians.				

Table 5 – Survey Results for Visits to Waterbody 7

Visit	Date	Egg search	Torching	Bottle trapping (15 traps)
1	26.04.10	+ve Lv	1 ♂ Lv	No amphibians.
2	28.04.10	+ve Lv	No amphibians.	6 ♂ Lv
3	04.05.10	+ve Lv	No amphibians.	1 ♀ Lv
4	10.05.10	+ve Lv	No amphibians.	1 ♀ Lv
Maximum count: 6 Smooth Newt				

Table 6 – Survey Results for Visits to Waterbody 8

Visit	Date	Egg search	Torching	Bottle trapping (10 traps)
1	26.04.10	Nil	No amphibians.	No amphibians.
2	28.04.10	Nil	No amphibians.	1 ♂ Lv.
3	04.05.10	Nil	No amphibians.	No amphibians.
4	10.05.10	Nil	No amphibians.	No amphibians.
Maximum count: 1 Smooth Newt				

Table 7 – Survey Results for Visits to Waterbody 9

Visit	Date	Egg search	Torching	Bottle trapping (20 traps)
1	26.04.10	+ve Lv	2 Rt	2 ♀ Lv, Rt tadpoles
2	28.04.10	+ve Lv	No amphibians.	Rt tadpoles
3	04.05.10	+ve Lv	No amphibians.	1 ♀ Lv, 6 ♂ Lv
4	10.05.10	+ve Lv	No amphibians.	2 ♀ Lv, 2 ♂ Lv
Maximum count: 7 Smooth Newt, 2 Common Frog				

Table 8 – Survey Results for Visits to Waterbody 10a

Visit	Date	Egg search	Torching	Bottle trapping
1	26.04.10	+ve Tc, +ve Lv	No amphibians.	Not possible as too shallow.
2	28.04.10	-	No amphibians.	
Survey visits aborted after second visit as too shallow for bottle trapping and torching difficult due to vegetation.				
11.05.10 Netting: 1 ♂ Lv, Rt tadpoles				
Maximum count: Great Crested Newt eggs only, 1 Smooth Newt.				

Table 9 – Survey Results for Visits to Waterbody 10b

Visit	Date	Egg search	Torching	Bottle trapping
1	26.04.10	+ve Tc, +ve Lv	No amphibians.	Not possible as too shallow.
2	28.04.10	-	No amphibians.	
Survey visits aborted after second visit as too shallow for bottle trapping and torching difficult due to vegetation.				
11.05.10 Netting: Rt tadpoles				
Maximum count: Great Crested Newt & Smooth Newt eggs only.				

Table 10 – Survey Results for Visits to Waterbody 11

Visit	Date	Egg search	Torching	Bottle trapping
1	26.04.10	Nil	No amphibians.	Not possible as too shallow & concrete sides.
2	28.04.10	Nil	No amphibians.	
Survey visits aborted after second visit as considered unsuitable for Great Crested Newts due to strength of flow.				
Maximum count: No amphibians				

Key to above tables:Tc – Great Crested Newt (*Triturus cristatus*)Lv – Smooth Newt (*Lissotriton vulgaris*)Rt – Common Frog (*Rana temporaria*)Rt t – Common Frog (*Rana temporaria*) tadpole

- 3.4.7 Further to the completion of the presence/ absence survey, Great Crested Newt eggs were recorded in a ditch (that is a continuation of Waterbody 11) approximately 80 m to the north of the survey site boundary (during detailed survey for Water Vole/ Otter).

Summary

- 3.4.8 Great Crested Newt eggs were recorded in two of the seven waterbodies subject to the presence/ absence survey, the closest of which (Waterbody 10a) is approximately 310 m from the survey site boundary. Great Crested Newt eggs have also been recorded from a ditch approximately 80 m from the survey site boundary. No adult Great Crested Newts were recorded from any of the surveyed waterbodies. Low numbers of Smooth Newt (adults and or eggs) were recorded from five of the seven surveyed waterbodies and Common Frog from one of the waterbodies.

Reptile Presence/ Absence Survey

- 3.4.9 The weather was generally good on all survey dates and suitable for this type of survey. The weather conditions are summarised in the following table.

Table 11 – Weather Conditions

Visit	Date	Time of Visit	Temperature Range	Wind (Beaufort scale)	General weather conditions
1	03.05.2010	PM	11.5-12.5°C	1-2(3)	Dry, 50% scattered cloud, frequent direct sun.
2	17.05.2010	AM	14.5°C	1-2	Dry, 50% scattered cloud, occasional direct sun.
3	18.05.2010	AM	18.3°C	1	Dry, 5-10% cloud, frequent direct sun.
4	24.05.2010	AM	15°C	1-2(3)	Dry, clear sky.
5	27.05.2010	AM	15.6°C	2	Dry, 40-50% scattered cloud, occasional direct sun.
6	28.05.2010	AM	13.5-15°C	0-1	Dry, 30-40% scattered cloud, frequent direct sun.
7	02.06.2010	AM	14.5-15.5°C	0-1	Dry, 30% scattered cloud, frequent direct sun.
8	04.06.2010	AM	16.5-18°C	1-2	Dry, clear sky.
9	08.06.2010	PM	15.5-16°C	0-1	Heavy rain in morning, 90% cloud.
10	10.06.2010	AM	14°C	0-1	100% cloud.

- 3.4.10 No reptiles were recorded during the ten survey visits outlined in *Table 11*. Common Toads (*Bufo bufo*) were recorded on three occasions under refugia (a maximum of 3 individuals in one visit).

4 EVALUATION

4.1 Habitat and Flora

Neutral Grassland and Tall-herb Vegetation

4.1.1 The survey site is dominated by species-rich neutral grassland with tall-herb vegetation. As the history of the survey site is unknown it is not possible to determine whether the grassland resource has developed on brown-field (*i.e.* previously developed) land or from agricultural fields that have been left unmanaged. However, considering its location within the boundaries of the Industrial Estate, it is considered that it is likely to be brown-field land. Regardless of its origin, it is thought to have been cleared in the recent past as furrow lines are evident. „Open mosaic habitats on previously developed land“ is both a UK BAP priority habitat and a habitat of principal importance within Wales under *Section 42* of the *NERC Act 2006*. The biodiversity value of derelict and industrial land is also recognised in the provision of a specific Habitat Action Plan (HAP) within the Wrexham BAP (Wrexham County Borough 2003). The UK BAP criteria³ for the selection of examples of this habitat type that are of high nature conservation value include the following:

- Rich and/or large examples of the habitat;
- Areas that have maintained bare ground and pioneer communities over an extended period;
- Threatened areas that support either the last remaining examples where the habitat was formerly widespread/ extensive, or rare/ specialised types of this habitat where the nature of the substrate is unusual;
- Presence of UK BAP priority species or Red Data Book/List species; and
- Importance of an exceptional assemblage of key species groups.

4.1.2 The habitat within the survey site, whilst broadly conforming to this habitat type, is unlikely to fulfil the above criteria, with the possible exception of the presence of UK BAP priority species (this is discussed in *Sections 4.2* and *4.3* below). If left unmanaged the floristic diversity is likely to decline over time as the species-rich grassland becomes more rank, ultimately leading to the development of scrub and possibly woodland. In addition, the vegetation would develop readily on similar sites and is inherently recreatable. Despite this, given its relative species-richness this habitat is considered likely to be of district⁴ value.

Other Habitat Types

4.1.3 Wrexham BAP includes a HAP for „River, stream and canal“. The short section of ditch/ stream within the survey site may be covered by this HAP. Although it would be covered under „Rivers“ in the UK BAP and the *NERC Act* it is unlikely to qualify as a priority habitat type. With the associated narrow scrub along the western boundary, it provides a potentially valuable and relatively undisturbed corridor habitat for a range of species. As such these habitat features (when considered individually) are likely to be of local value⁵.

³ http://www.ukbap.org.uk/library/UK_BAP_priority_habitat_descriptions_20080929.pdf

⁴ District value – areas of habitat that are considered to enrich the habitat resource within the context of the district (*i.e.* Wrexham County Borough) (after IEEM 2006).

⁵ Local value – areas of habitat that are considered to enrich the habitat resource within the context of the parish or neighbourhood (after IEEM 2006).

Flora

- 4.1.4 Seven plants of note were recorded within the survey site; *Prunus cerasifera* (Cherry-plum), *Lactuca serriola* (Prickly Lettuce), *Lathyrus nissolia* (Grass Vetchling), *Picris echioides* (Bristly Ox-tongue), *Silene silene* (Pepper-saxifrage), *Senecio erucifolius* (Hoary Ragwort) and *Ophioglossum vulgatum* (Common Adder's-Tongue). Cherry-plum and Common Adder's-Tongue were associated with the planted scrub at *Target Note 3*. Prickly Lettuce and Bristly Ox-tongue were recorded in low numbers within the neutral grassland at *Target Note 1*. Grass Vetchling, Pepper-saxifrage and Hoary Ragwort were all recorded as being frequent or abundant within the neutral grassland.
- 4.1.5 All of these plant species are identified as „scarce“⁶ in VC50 – Denbighshire (Green 2006). Cherry-plum is considered to be non-native. Both Cheffings & Farrell (2005) and Dines (2008) categorise the remaining plants as of „Least Concern“ in the most recent Vascular Plant Red Data Lists for Great Britain and Wales respectively. Most of these plants are considered to be under-recorded. Prickly Lettuce is identified as „locally threatened“ in the Wrexham BAP.

4.2 Fauna

General

- 4.2.1 Evidence of species that receive specific legal protection recorded within the survey site or immediately adjacent habitats was limited to Badger.

Badger

- 4.2.2 No setts were recorded within the survey site. Opportunities for sett construction are limited to the denser areas of scrub located along the western boundary. Signs of Badger activity were restricted to three breach points and two paths. Overall the site is considered of relatively low potential value for foraging. Badger has a specific Species Action Plan (SAP) in the Wrexham BAP.
- 4.2.3 Habitat that could potentially support several protected species was also noted. These species are as follows:
- Bats;
 - Water Vole;
 - Otter;
 - Great Crested Newt;
 - Reptiles; and
 - Breeding birds.

Bats

- 4.2.4 The survey site is considered likely to provide mostly limited value for foraging bats, although the ditch/ stream corridor and associated scrub along the western boundary may be of particular potential value for foraging/ commuting. No trees with any roost potential were recorded. The limited data review provided a bat record from approximately 580 m to the

⁶ In Vice County 50, a scarce plant is described as being recorded in 4-15 10 km squares.

east of the survey site and the Industrial Estate is known to be utilised by a number of species.

Water Vole and Otter

- 4.2.5 The short length of ditch/ stream along the western boundary is considered to provide sub-optimal potential habitat for Water Vole. There are no Water Vole records from SJ34 on the NBN Gateway. No evidence of Water Vole was recorded during the detailed survey; this species will not be mentioned further in this report.
- 4.2.6 The ditch/ stream could potentially be used by Otters particularly for dispersal/ commuting. It also provides dense vegetative cover along the adjacent banks. However the likelihood that it is used by this species is reduced by its relative isolation. The length of stream within the survey site is located almost 1 km away from the Afon Clywedog (the closest watercourse known to support Otter) with no obvious, uninterrupted dispersal route evident (from studying OS mapping). No evidence of Otter was recorded during the detailed survey; this species will not be mentioned further in this report. Otter has a SAP in the Wrexham BAP.

Great Crested Newt

- 4.2.7 Aquatic habitat within the survey site is limited to the short section of ditch that is considered unlikely to provide suitable conditions for breeding (no evidence of such was determined during the detailed presence/ absence survey). It could however potentially provide suitable aquatic habitat for foraging. The whole of the survey site however provides a relatively large area of potentially high quality terrestrial habitat; this provides opportunities for foraging, dispersal and for hibernation; it is also linked to the wider landscape. The unmanaged grassland on the survey site does provide a better potential terrestrial habitat resource than provided by much of the agricultural land to the west.
- 4.2.8 The potential presence of Great Crested Newts in terrestrial habitat is governed more by the proximity of a suitable breeding pond than by the quality of the terrestrial habitat. There are seven known waterbodies within at least 500 m of the survey site (Waterbodies 5, 7, 8, 9, 10a, 10b and 11 on *Figure 4*). The closest of these waterbodies to the survey site is the ditch (Waterbody 11) that is partly located within the survey site and extends northwards away from the survey site; Waterbodies 7 and 9 are both located within 250 m of the survey site and Waterbodies 5, 8, 10 and 10b within 250 to 500 m.
- 4.2.9 No adult or juvenile Great Crested Newts were recorded during the presence/ absence survey. A small number of Great Crested Newt eggs only were recorded from Waterbodies 10a and 10b (approximately 310 m and 385 m from the survey site boundary respectively), and also in a ditch (that is a continuation of Waterbody 11) approximately 80 m to the north of the survey site boundary. Small numbers of Smooth Newt and Common Frog were also recorded.
- 4.2.10 Nine Great Crested Newt records have been provided for within 1 km of the survey site although only two are located within 500 m of the survey site. These comprise a 1992 egg-search record for „Pear Tree Cottage“ (OS Grid Ref. SJ 3698 4954) and a 2007 terrestrial record of three Great Crested Newts from the parcel of land to the immediate north of the survey site. There are a large number of records for Great Crested Newt around Wrexham Industrial Estate predominantly to the east and south of the site.

- 4.2.11 Based on both the results of the presence/ absence survey and the background data search there is one waterbody within 250 m of the survey site that supports Great Crested Newts (the ditch; a continuation of Waterbody 11 to the north of the survey site boundary). Two further waterbodies within 250 to 500 m (Waterbodies 10a and 10b) also support Great Crested Newts. Eggs were recorded within the ditch approximately 80 m from the boundary of the survey site; the population size is unknown. Eggs were also recorded from Waterbodies 10a and 10b. It is thought unlikely that more than a small population of Great Crested Newts would be supported at all three waterbodies.
- 4.2.12 There is direct habitat linkage between the survey site and the ditch to the north, as well as the immediate land parcel to the north where terrestrial Great Crested Newts have previously been recorded. As such the chance that Great Crested Newts might access the survey site is considered to be moderate to high, although it is thought likely that the numbers that may utilise the terrestrial habitat present would be small.

Reptiles

- 4.2.13 The terrestrial habitat within the survey site is potentially suitable for all four widespread reptile species but in particular Slow-worm, Viviparous Lizard and Grass Snake. The limited data review provided a record for both Slow-worm and Adder from SJ3849, an adjacent grid square to the survey site. Reptiles are known to utilise similar sites on the Industrial Estate. No evidence of reptiles was recorded during the detailed presence/ absence survey, for which ten visits have been undertaken. This level of survey effort complies with (and goes further than) advice provided by Froglife (1999). The lack of reptiles recorded during the presence/ absence survey indicates likely absence and that a significant population does not inhabit the survey area at the present time.

Birds

- 4.2.14 The habitat resource available within the survey site is likely to provide opportunities for a small number of nesting birds including possibly ground-nesting species. Species of bird that breed within the site cannot be confirmed without further survey.

Other Species

- 4.2.15 In addition to species that receive specific legal protection the survey site supports other species of conservation interest; Dingy Skipper and Common Toad.
- 4.2.16 The Dingy Skipper remains relatively widespread in north Wales and can be found in large numbers at some sites. It is largely uncommon due to loss of habitat in recent years. Although the Dingy Skipper is a sedentary species (most Dingy Skippers stay within small discrete colonies) and is unlikely to colonise new areas unless suitable habitat is directly adjacent to an existing population, observations of natural colonisations suggest that some individual Dingy Skippers can move several kilometres (Bourn *et al.* 2000). The Dingy Skipper (*Erynnis tages*) is listed as a „Species of principal importance for the conservation of biological diversity in Wales“ under Section 42 of the *Natural Environment and Rural Communities Act 2006 (NERC Act 2006)*. It is also a UK BAP priority species. It is identified by Butterfly Conservation as a medium priority species important in Wales. It is considered that the Dingy Skippers recorded on the survey site are likely to be part of a small population comprising a few individuals at most.

- 4.2.17 Common Toad has been recorded in low numbers from the survey site. This species is a species of principal importance for conservation of biological diversity in Wales under the *NERC Act 2006*, a UK BAP priority species and is identified as a „species of conservation concern“ in the Wrexham BAP. This area of the Industrial Estate is also known to be important for the other more widespread amphibians; Common Frog and Smooth Newt.

4.3 Summary of Ecological Value

- 4.3.1 The survey site is dominated by species-rich neutral grassland/ tall-herbs which may be considered to be of district ecological value; other habitat features are limited to a short section of ditch/ stream and associated scrub vegetation (individually of local value at most). Evidence of legally protected species recorded within the survey site was restricted to Badger, although habitat that could potentially support bats, Water Vole, Otter, Great Crested Newt, reptiles and breeding birds was also noted. Detailed surveys confirmed the absence of Water Vole and Otter from the ditch/ stream corridor and of the likely absence of reptiles from the survey site. Great Crested Newts eggs were recorded from three waterbodies within 500 m and the survey site provided high quality potential terrestrial habitat for this species. Dingy Skipper has also been recorded on the survey site, although the population is considered likely to be small.

5 ECOLOGICAL ISSUES

5.1 General

5.1.1 As outlined in *Section 1.3*, preliminary details of the proposed development are illustrated on a C4 Consulting LLP drawing no. 10/036/PL/03A entitled „*Clywedog Road South, Wrexham Industrial Estate, Wrexham, Proposed Site Layout*“ (dated 03/11). With regards the 36.78% of the site which is proposed to be set aside as an ecological compensation area, the drawing indicates that a single „*balancing pond*“ will be provided as well as „*footpaths to proposed staff amenity areas to be mown strips within grass*“. It is understood that the „*balancing pond*“ will incorporate a sustainable drainage system and that the „*staff amenity areas*“ will be limited to provision of seating (to allow limited access to the compensation area by on-site personnel).

5.1.2 This drawing and associated information has been used to provide an assessment of ecological issues as follows:

- further survey requirements; and
- potential development constraints and associated mitigation requirements.

These are dealt with in turn for habitats and flora, and specific species groups in the section below.

5.1.3 To undertake a detailed assessment of the potential impacts of any proposed development on the ecological resource, full details of the proposals would be required including the final development boundary, methods and machinery, timing of works, duration of works, access to the development areas and subsequent detailed landscaping/ restoration proposals. Potential mitigation outlined below is therefore fairly generic and would need further consideration both with regard to the scheme details and the results of further surveys if required. Should the details regarding the proposed development differ from that presented in drawing no. 10/036/PL/03A then the mitigation detailed below may need to be re-considered.

5.2 Further Survey and Mitigation

General

Wrexham Local Planning Guidance Note 29

5.2.1 Wrexham Local Planning Guidance Note 29 (Wrexham Industrial Estate: Employment Development and Nature Conservation) was adopted by Wrexham County Borough Council (WCBC) in April 2009. LPG29 states that [paragraph 6.8] „*in providing mitigation or compensation, an equivalent area of land must be provided unless it can be demonstrated that a smaller area of better quality would enhance the ecology of the site or the wider area*“ and further that [paragraph 6.7] „*on-site mitigation/ compensation [should] enhance the nature conservation value of the site and/ or the network of wildlife habitats of which it forms a part*“.

5.2.2 LPG29 also requires for the submission of a „method statement/ concept plan“ and „management plan“ with planning applications. It is understood (Damian Horridge, C4

Consulting LLP, *pers. comm.*) that the principles of these documents were agreed with WCBC at a pre-application meeting held on 14th December 2010.

Protected Sites

- 5.2.3 No statutory sites will be directly or indirectly impacted by any proposed development. There are no such sites within at least 1 km of the survey site boundary.
- 5.2.4 No non-statutory sites will be directly impacted by the proposed development. The closest such site is Cefn Park WS (W316) which is located 300 m to the north of the survey site boundary. Due to the scale and nature of the proposed development no indirect impacts on these sites are predicted.

Habitat and Flora

- 5.2.5 No further survey of the habitat or flora within the survey site is required. Seven locally scarce plants were recorded. As previously noted, the proposed development will comprise approximately 63.22% of the „survey site“, with the remaining 36.78% to be provided as an ecological compensation area. The compensation area will comprise species-rich neutral grassland as well as the scrub/ ditch corridor along the western margin of the survey site. It will be further detailed in the method statement/ concept plan (refer to *paragraph 5.2.2*).
- 5.2.6 Although the proposed development footprint will impact on locally scarce plants, populations of the five grassland species recorded should be retained within the compensation area. It may also be possible to create conditions for their natural establishment as part of any soft-landscaping proposals within the development footprint itself. The two locally scarce plants recorded in the scrub corridor at *Target Note 4* will be retained within the compensation area and, as such, will not be impacted by the proposed development.
- 5.2.7 Provision of the compensation area allows an opportunity to appropriately manage the grassland (taking into account other ecological features, such as butterflies, Great Crested Newts *etc*, refer below) in order to retain/ enhance its value and prevent succession and associated loss of ecological value. This will be detailed in a management plan (refer to *paragraph 5.2.2*). Further detail with regards the proposed pond is discussed with regards Great Crested Newts below. As referred to above, any proposed development should seek to utilise the neutral grassland (and associated soil) from the footprint of the development to spread over areas of any soft-landscaping proposals within the development footprint. Should this not be practical, appropriate wild-flower seed mixes (of at least British native origin) should be utilised wherever possible.
- 5.2.8 Drawing no. 10/036/PL/03A (indicative only) illustrates tree/ shrub planting along the southern boundary, the Clywedog Road South frontage and partly along the edge of the development site/ western block of the compensation area. Any such planting should utilise British native species (ideally of local provenance). Within the compensation area the planting of trees/ shrubs should be restricted (ideally no trees/ shrubs would be planted along the edge of the development site/ western block of the compensation area). However consideration could be given to planting hedgerows (to be managed) along the southern/ northern boundaries (as well as the Clywedog Road South frontage) to facilitate habitat linkage.

Fauna

Badger

- 5.2.9 No setts were recorded within the survey area, however the scrub adjacent to the western boundary (as well as various features on immediately adjacent land) presents opportunities for sett construction. As a consequence of the protection afforded to badgers and their setts, work that could disturb badgers is illegal without a licence. The Countryside Council for Wales has produced guidelines (CCW 1999) on the types of activity that it considers should be licensed within certain distances of sett entrances. For example, using very heavy machinery (usually tracked vehicles) within 30 m of an entrance to an active badger sett, lighter machinery (generally wheeled vehicles) within 20 m, and light work such as hand digging or scrub clearance within 10 m, may require a licence. In addition, CCW state that some activities (e.g. pile-driving) may cause disturbance at greater distances (usually 100 m) than those listed above.
- 5.2.10 Any features that could potentially support a sett (*Target Notes 3, 4 and 7*, as well as hedgerows located to the west of the survey site) and which are located within approximately 50 m of the proposed development boundary (including areas for example subject to pond construction) should be subject to a brief check immediately prior to construction or the implementation of other potentially licensable operations. This would ensure that no setts had been created in the intervening period. If a sett is located during this check decisions can be taken regarding any requirement for mitigation at that time.
- 5.2.11 As the survey site is not considered to be an important foraging resource for Badger, the development as proposed (63.22% development, 36.78% compensation area) is considered unlikely to result in any measurable impact. Any shrub/ tree/ hedgerow planting associated with the proposed development could incorporate native fruiting shrubs (e.g. Elder and Hawthorn), that may be utilised for foraging purposes. Although the development footprint will impinge on their pathway as recorded, Badgers will still be able to move north/ south across the compensation area (as they currently do).
- 5.2.12 As Badgers are known to traverse the survey site, there is potential for obstruction of Badger movements during any construction activities. Where construction includes the excavation of deep holes or trenches, such features should be filled in overnight or otherwise made safe by securely covering them or the provision of suitable ramps. In addition all open ends of pipes or other materials that Badgers may access should be securely blocked up overnight. Furthermore, any fencing that is required during the construction and operation phases should take into account Badger movements so that they are not unnecessarily obstructed.

Bats

- 5.2.13 No potential roost sites have been recorded on the survey site. There is the potential for the ditch/ scrub corridor along the western boundary of the survey site to be utilised by foraging/ commuting bats, however drawing no. 10/036/PL/03A indicates that this feature will not be impacted; no specific further survey or mitigation is therefore required. Any provision of hedgerows will be of potential future value to foraging/ commuting bats.
- 5.2.14 The potential impact of lighting on bats that may use the area should also be considered. Lighting associated with any proposed development should follow guidance provided by The Bat Conservation Trust and Institution of Lighting Engineers (2008). No details are currently

available concerning proposed lighting. Any security lighting to be installed on the industrial sheds or elsewhere should utilise low pressure sodium lamps or similar and where close to boundary features (e.g. *Target Notes 3 and 4*), and retained/ created grassland within the compensation area, should be fitted with baffles and point straight down into the site or to where it is needed to avoid light spillage. The brightness of these lamps should be as low as legally possible and they should be placed as low as possible on the new buildings.

Great Crested Newt

- 5.2.15 There are seven known ponds within 500 m of the survey site boundary. A single waterbody within 250 m of the survey site (the ditch; a continuation of Waterbody 11 to the north of the survey site boundary) is known to support Great Crested Newts (eggs). Two further waterbodies within 250 to 500 m (Waterbodies 10a and 10b) also support Great Crested Newts (eggs). It is thought unlikely that more than a small population of Great Crested Newts would be supported at all three waterbodies. A terrestrial record of Great Crested Newts has been provided for the land parcel to the immediate north of the survey site.
- 5.2.16 As such, and as the likelihood of Great Crested Newts potentially accessing the survey site is considered to be moderate to high, it is considered that a Welsh Assembly Government (WAG) „development“ licence will be required in order for development works to be legally carried out. The associated licence application would be required to consider in detail maintenance of the Favourable Conservation Status (FCS) of the species in this area both during construction and operation phases. Subject to granting of the WAG licence Great Crested Newts (and other amphibians) would be translocated from the proposed development footprint ahead of any preparatory or construction works. This is likely to require enclosing all work areas (including the footprint of the proposed ponds (refer below) and any soft landscaping areas) in amphibian exclusion fencing. Should the terrace of industrial units in the south of the development site be developed at a later stage, it may require semi-permanent exclusion fencing to be erected. Although 30-days (in suitable weather conditions) is usually the minimum trapping requirement there is the potential to reduce this or, for example, include a review mechanism after 15-20 days (dependant on capture rates) subject to discussion with Countryside Council for Wales.
- 5.2.17 The proposed ecological compensation area (36.78% of the site or 0.89 hectares, as indicated on drawing no. 10/036/PL/03A) would need to be provided in perpetuity (with appropriate land-tenure secured) and all development rights within the compensation area being relinquished. Commitment to long-term (normally 21 years) appropriate newt-friendly management of the compensation area will also need to be secured; this will be guided by a management plan with a 5-year review mechanism. Site security will need to be maintained and discussion will be required with WCBC and CCW regarding an appropriate mechanism. Appropriate management of the compensation area will need to be provided and funded, either directly through a third party (e.g. the local Wildlife Trust) or with appropriate advice from a third party. Monitoring of the translocated population may also be required.
- 5.2.18 Although drawing no. 10/036/PL/03A indicates a single „balancing pond“, it is suggested that several smaller ponds be excavated as well/ or instead of this feature (especially if the focus of the balancing pond is to be a sustainable drainage system, for example to include a reed bed or similar). The smaller ponds should in total be of an equivalent size to the single pond as shown; individually they should be of various sizes and depths and be designed to be

suitable for breeding Great Crested Newts. These ponds would be considered as compensation for terrestrial habitat that is to be lost (to Great Crested Newts) as part of the development; as such they would also need to be appropriately managed (as outlined above). It would also be appropriate to consider the construction of several associated hibernacula. Further detail will be included in the „method statement/ concept plan“.

Reptiles

- 5.2.19 Although no reptiles have been recorded within the survey site it is possible that individuals from adjacent suitable habitat may traverse the area. A simple watching brief protocol would be provided to check for reptiles during translocation of Great Crested Newts. Herptile exclusion fencing will be maintained around the development site during the construction phase.

Birds

- 5.2.20 No further survey is required. The destruction of any bird nests that are in use is illegal. The simplest option to avoid issues arising from the presence of nesting birds is to schedule work that affects nesting habitat (e.g. removal of trees, shrubs and other vegetation, including grassland) outside the nesting period (March to August inclusive). If it is not possible to clear vegetation outside the nesting season (including shrubs/ trees and grassland/ tall-herbs) all such areas should be checked by a suitably qualified ecologist prior to commencement of works. If a nest is found a buffer zone of no less than 5 m should be retained and fenced off around the nest until any chicks have fledged.
- 5.2.21 The development proposal indicated on drawing no. 10/036/PL/03A will result in the loss of grassland/ tall-herb habitat with some scattered shrubs. The ecological compensation area provides a similar habitat resource. If appropriate, it may also be possible to provide bird boxes on the proposed industrial sheds and or existing trees along the western margin of the survey site.

Other Species

- 5.2.22 *Section 42 of the Natural Environment and Rural Communities Act 2006* requires the National Assembly for Wales to prepare and publish a list of species and habitats that it considers to be of principal importance for the conservation of biological diversity in Wales. *Section 74* also places a duty on the National Assembly for Wales to have regard, in exercising all its functions, to conserve biological diversity in accordance with the United Nations Convention on Biodiversity.
- 5.2.23 Although the population size of Dingy Skipper is unknown, it is considered likely to be a few individuals at most. Considering the character of the habitat within the footprint of the proposed development (as indicated on drawing no. 10/036/PL/03A) the potential impacts of the proposed development on Dingy Skipper are thought likely to be negligible. Management of the grassland resource within the compensation area, to be guided by a management plan, should (taking into account the requirement for other species groups) include appropriate enhancement (such as mowing to create a variable sward height to include patches of low growing forbs and potentially physical perturbation to create small bare areas) in order that the site would be suitable for this species in the long-term.

- 5.2.24 The survey site is known to support small numbers of Common Toads. This area of the Industrial Estate is also known to be important for the other more widespread amphibians; Common Frog and Smooth Newt. Mitigation/ compensation for these species will be achieved in combination with any Great Crested Newt mitigation as outlined above.

6 TARGET NOTES

Target Note 1. Neutral grassland. This resource appears to have developed on relatively recently cleared land (possibly in the last 10-20 years); there is evidence of parallel „furrow“ lines. The substrate appears to be dominated by clay material and although surface water was limited to occasional deeper furrows, the site is known to support extensive surface water after periods of heavy rain. Broadly, much of the resource is similar in structure and composition, being species-rich and with an approximate average sward height of between 0.5 and 0.75 m; it is unmanaged and could be described as rank. The sward comprises a range of grasses and sedges such as frequent/ locally abundant *Deschampsia cespitosa* (Tufted Hair-grass) and *Carex nigra* (Common Sedge), frequent *Holcus lanatus* (Yorkshire-fog), locally frequent tussocks of *Juncus inflexus* (Hard Rush) and *Carex otrubae* (False-fox Sedge), with lesser amounts of *Juncus effusus* (Soft-rush), *Juncus conglomeratus* (Compact Rush), *Arrhenatherum elatius* (False Oat-grass), *Cynosurus cristatus* (Crested Dog's-tail), *Agrostis capillaris* (Common Bent), *Agrostis stolonifera* (Creeping Bent), *Phleum pratense* (Timothy) and *Poa trivialis* (Rough Meadow-grass). A wide range of tall-herbs and lower growing forbs occur throughout the sward. Species recorded include abundant *Centaurea nigra* (Common Knapweed) and *Ranunculus repens* (Creeping Buttercup), frequent to locally abundant *Lathyrus nissolia* (Grass Vetchling), *Pulicaria dysenterica* (Common Fleabane), *Potentilla reptans* (Creeping Cinquefoil) and *Torilis nodosa* (Upright Hedge-parsley), frequent *Leucanthemum vulgare* (Oxeye Daisy), *Vicia cracca* (Tufted Vetch), *Epilobium parviflorum* (Hoary Willowherb), *Senecio erucifolius* (Hoary Ragwort), *Vicia tetrasperma* (Smooth Tare), occasional to locally frequent *Dactylorhiza fuchsii* (Common Spotted-orchid) and *Silene silaus* (Pepper-saxifrage) and lesser amounts of *Plantago lanceolata* (Ribwort Plantain), *Lotus pedunculatus* (Greater Bird's-foot-trefoil), *Lotus corniculatus* (Common Bird's-foot-trefoil), *Lathyrus pratensis* (Meadow Vetchling), *Medicago lupulina* (Black Medick), *Achillea ptarmica* (Sneezewort), *Primula veris* (Cowslip), *Prunella vulgaris* (Selfheal), *Blackstonia perfoliata* (Yellowwort), *Centaurea erythraea* (Common Centaury), *Hypericum maculatum* (Imperforate St. John's-wort), *Heracleum sphondylium* (Hogweed), *Picris echioides* (Bristly Ox-tongue), *Achillea millefolium* (Yarrow), *Cirsium arvense* (Creeping Thistle), *Urtica dioica* (Common Nettle), *Lactuca serriola* (Prickly Lettuce) and *Epilobium hirsutum* (Great Willowherb).

Small stands of tall-herbs are scattered throughout [too small to map on *Figure 2*] although a larger stand is located at *Target Note 1a*. Here *Epilobium hirsutum* (Great Willowherb) dominates with locally abundant *Deschampsia cespitosa* (Tufted Hair-grass), frequent *Juncus inflexus* (Hard Rush), *Cirsium vulgare* (Spear Thistle), *Scrophularia nodosa* (Common Figwort), *Rumex conglomeratus* (Clustered Dock), *Cardamine pratense* (Cuckooflower), and lesser amounts of *Carex otrubae* (False Fox-sedge), *Pulicaria dysenterica* (Common Fleabane), *Centaurea nigra* (Common Knapweed), *Filipendula ulmaria* (Meadowsweet) and *Urtica dioica* (Common Nettle). There are also scattered small stands of *Typha latifolia* (Bulrush). Very locally, the grassland could be considered to be marshy grassland, for example at *Target Note 1b* where *Juncus inflexus* (Hard Rush) dominates with frequent *Pulicaria dysenterica* (Common Fleabane) and *Achillea ptarmica* (Sneezewort).

There is scattered young scrub across the neutral grassland; mostly individual shrubs of *Salix cinerea* (Grey Willow), *Rosa canina* agg. (Dog-rose) and *Crataegus monogyna* (Hawthorn), and locally incipient *Rubus fruticosus* agg. (Bramble).

Target Note 2a. An animal breach under a post-and-wire boundary fence. Although no evidence of Badger (*Meles meles*) was located at this breach it is connected, via a moderately used animal path (*Target Note 2b*) to another breach at *Target Note 2c* where a Badger hair was recorded. Evidence of Badger foraging was also observed along the boundary of an arable field immediately adjacent to the site at *Target Note 2c*.

Target Note 3. A narrow band of scrub/ scrub-woodland on the western boundary of the survey site. It is approximately 10 m across at its widest point and is partly located on a slight slope up to the boundary fence. This feature has been planted; planting stakes are still evident. Trees and shrubs present include abundant *Prunus cerasifera* (Cherry-plum) and occasional *Malus domestica* agg. (Apple), *Quercus robur* (Pedunculate Oak), *Fraxinus excelsior* (Ash) and *Crataegus monogyna* (Hawthorn). The associated field-layer is grass dominated and includes a range of species that demonstrate it is likely to be a remnant of the adjacent grassland described at *Target Note 1*. Very

occasionally, where more shaded, a carpet of *Hedera helix* (Ivy) is evident. The largest trees are approximately 12 m tall with diameters at breast height (dbh"s) of 0.3 m; they do not offer any potential to roosting bats.

Target Note 4. A section of ditch/ stream located adjacent to part of the western boundary of the survey site. It enters the survey site in the north-west corner and runs in a southerly direction for approximately 100 m before entering into a culvert. It is approximately 1.5 m wide at water level and approximately 0.2 m deep, over a silty substrate. Much of the channel has a concrete bed and banks to a height of approximately 1.5 m. It has a slow to moderate flow although in places accumulations of leaf litter and over-hanging vegetation reduce the flow-rate. The majority is heavily shaded by overhanging trees/ shrubs; here in-channel vegetation appears limited to the floating-leaved *Lemna minor* (Common Duckweed) and occasional marginal plants. In more open areas the channel is characterised by abundant *Apium nodiflorum* (Fool"s Water-cress) with locally frequent *Epilobium hirsutum* (Great Willowherb) and lesser amounts of both *Mentha aquatica* (Water Mint) and *Veronica beccabunga* (Brooklime).

The banks extend to approximately 2 m above the water level being of earth material above the concrete reinforcement; they are steep at approximately 60°. The eastern bank supports a narrow band of dense scrub, although immediately adjacent to the channel small pockets of tall-herb and grassland vegetation occasionally occur. The scrub is dominated by *Crataegus monogyna* (Hawthorn) with associates including locally dominant *Rubus fruticosus* agg. (Bramble) and occasional *Rosa canina* agg. (Dog-rose), *Salix cinerea* (Grey Willow) and young *Quercus robur* (Pedunculate Oak) saplings.

The western bank (and a narrow band of adjacent land between the ditch and a boundary fence) mostly supports a narrow band of dense scrub/ scrub-woodland. A small stand to the south comprises a complex mosaic of grasses/ tall-herbs and scattered shrubs. Both *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) are abundant with associates including locally frequent *Quercus robur* (Pedunculate Oak), with *Malus domestica* agg. (Apple), *Fraxinus excelsior* (Ash), *Salix fragilis* (Crack Willow) and *Rosa arvensis* (Field-Rose). The largest trees are approximately 10 m tall with dbh"s of 0.3 m; they do not offer any potential to roosting bats.

Target Note 5. An animal breach under a post-and-wire boundary fence where several Badger hairs were recorded. A short section of well-used Badger path is also evident, although within the survey site the path disappears into dense *Rubus fruticosus* agg. (Bramble) scrub.

Target Note 6. Neutral grassland located within the grounds of an industrial unit immediately to the north of the survey site [no direct access]. A narrow band along the boundary with the survey site supports a similar community to that described at *Target Note 1*. However, much of the resource appears to have developed over fairly recently cleared land; it also appears to be currently unmanaged. It is variable in structure and composition comprising frequent tussocks of *Juncus inflexus* (Hard Rush) with shorter sedge dominated vegetation in-between. Small stands of *Typha latifolia* (Bulrush) were evident. This resource could not be assessed in detail.

Target Note 7. A narrow band of young mixed plantation woodland on a man-made embankment immediately to the north of the survey site [no direct access]. Tree species present include *Pinus sylvestris* (Scot"s Pine), *Betula pendula* (Silver Birch), *Crataegus monogyna* (Hawthorn) and *Salix caprea* (Goat Willow). Towards the ditch this grades into *Rubus fruticosus* agg. (Bramble) dominated scrub.

7 REFERENCES

Asher, J., Warren, M., Fox, R., Harding, P., Jeffcoate, G. and Jeffcoate, S. (2001). *The Millennium Atlas of Butterflies in Britain and Ireland*. Oxford University Press, Oxford.

Bat Conservation Trust (2007). *Bat Surveys – Good Practice Guidelines*. Bat Conservation Trust, London.

Bat Conservation Trust & Institution of Lighting Engineers. (2008). *Bats and Lighting in the UK – Bats and the Built Environment Series*.

Beebee, T. & Griffiths, R. (2000). *Amphibians and Reptiles*. HarperCollins, London.

Biota (2007). *Ecological Survey at Clywedog Road, Wrexham Industrial Estate*. Unpublished report (No. 2007/64).

Bourn, N.A.D., Jeffcoate, G.E. & Warren, M.S. (2000). *Species Action Plan – Dingy Skipper Erynnis tages*. Butterfly Conservation, Wareham.

Chanin, P. (2003). *Monitoring the Otter (Lutra lutra)*. Conserving Natura 2000. River Monitoring Series no. 10, English Nature, Peterborough.

Countryside Council for Wales (1999). *Badgers: A Guide for Developers*. CCW, Bangor.

Eaton, M.A., Brown, A.F., Noble, D.G., Musgrove, A.J., Hearn, R., Aebischer, N.J., Gibbons, D.W., Evans, A. & Gregory, R.D. (2009). Birds of Conservation Concern 3: the population status of birds in the United Kingdom, Channel Islands and the Isle of Man. *British Birds* 102, pp296-341.

English Nature (2004). *Reptiles: guidelines for developers*. English Nature, Peterborough.

Froglife (1999). *Froglife Advice Sheet 10. Reptile Survey – An Introduction to Planning, Conducting and Interpreting Surveys for Snake and Lizard Conservation*. Froglife.

Green, J.A. (2006). *The Flowering Plants of Denbighshire – A Botanical Checklist for VC50*. Powlsons Ltd, Colwyn Bay.

Harris, S., Cresswell, P., & Jefferies, D. (1989). *Surveying Badgers*. Occasional Publication No. 9, The Mammal Society.

HMSO (1981). *The Wildlife and Countryside Act 1981*. HMSO, London.

HMSO (2000). *The Countryside and Rights of Way Act 2000*. HMSO, London.

HMSO (2006). *The Natural Environment and Rural Communities Act 2006*. HMSO, London.

HMSO (2010). *The Conservation of Habitats and Species Regulations 2010*. HMSO, London.

<http://www.biodiversitywales.org.uk/admin/upload/docs/english/Section%2042%20Priority%20List.doc>

<http://www.ccw.gov.uk/interactive-maps/protected-areas-map.aspx>

<http://www.magic.gov.uk>

<http://data.nbn.org.uk/>

http://www.planningportal.gov.uk/wps/portal/genpub_DevelopmentPlans?docRef=DEVPlans&scope=202&langid=0

Institute of Ecology and Environmental Management (2005). *Guidance on Survey Methodology*. Unpublished.

Institute of Ecology and Environmental Management (2006). *Guidelines for Ecological Impact Assessment in the United Kingdom (Approved Version: 26 June 2006)*. Unpublished.

Institute of Environmental Assessment (1995). *Guidelines for Baseline Ecological Assessment*. E & FN Spon, London.

Joint Nature Conservation Committee (2003). *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit (revised reprint)*. Joint Nature Conservation Committee, Peterborough.

JNCC (2004). *Common Standards Monitoring for Terrestrial Mammals, Version August 2004*. ISSN 1743-8160.

Oldham, R.S., Keeble, J., Swan, M.J.S. & Jeffcote, M. (2000). Evaluating the Suitability of Habitat for the Great Crested Newt (*Triturus cristatus*). *Herpetological Journal*, Vol 10, pp143-155.

Stace, C.A. (1997). *A New Flora of the British Isles, 2nd edition*. Cambridge University Press, Cambridge.

Strachan, R & Moorhouse, T. (2006; 2nd edition). *Water Vole Conservation Handbook*. WildCRU, Oxford.

UK Biodiversity Steering Group (1995). *Biodiversity: The UK Steering Group Report Volume 2: Action Plans*. HMSO, London.

UK Biodiversity Steering Group (1998a). *UK Biodiversity Group Tranche 2 Action Plans Vol I Vertebrates and Vascular Plants*. English Nature.

UK Biodiversity Steering Group (1998b). *UK Biodiversity Group Tranche 2 Action Plans: Volume II – Terrestrial and Freshwater Habitats*. English Nature.

Wrexham County Borough (2003). *Wrexham Biodiversity Action Plan (Edition 2 – September 2003)*. The Planning Department, WCBC.

WCBC (2009). *Wrexham Local Planning Guidance Note 29 (Wrexham Industrial Estate: Employment Development and Nature Conservation)*. The Planning Department, WCBC.

Wrexham Landmap. Supplementary Planning Guidance (adopted March 2007) [Online]. Available from http://www.wrexham.gov.uk/english/planning_portal/landmap/spg.htm

8 DATA

Table 12 – Vascular plant species recorded within the survey site during the Extended Phase 1 Habitat Survey

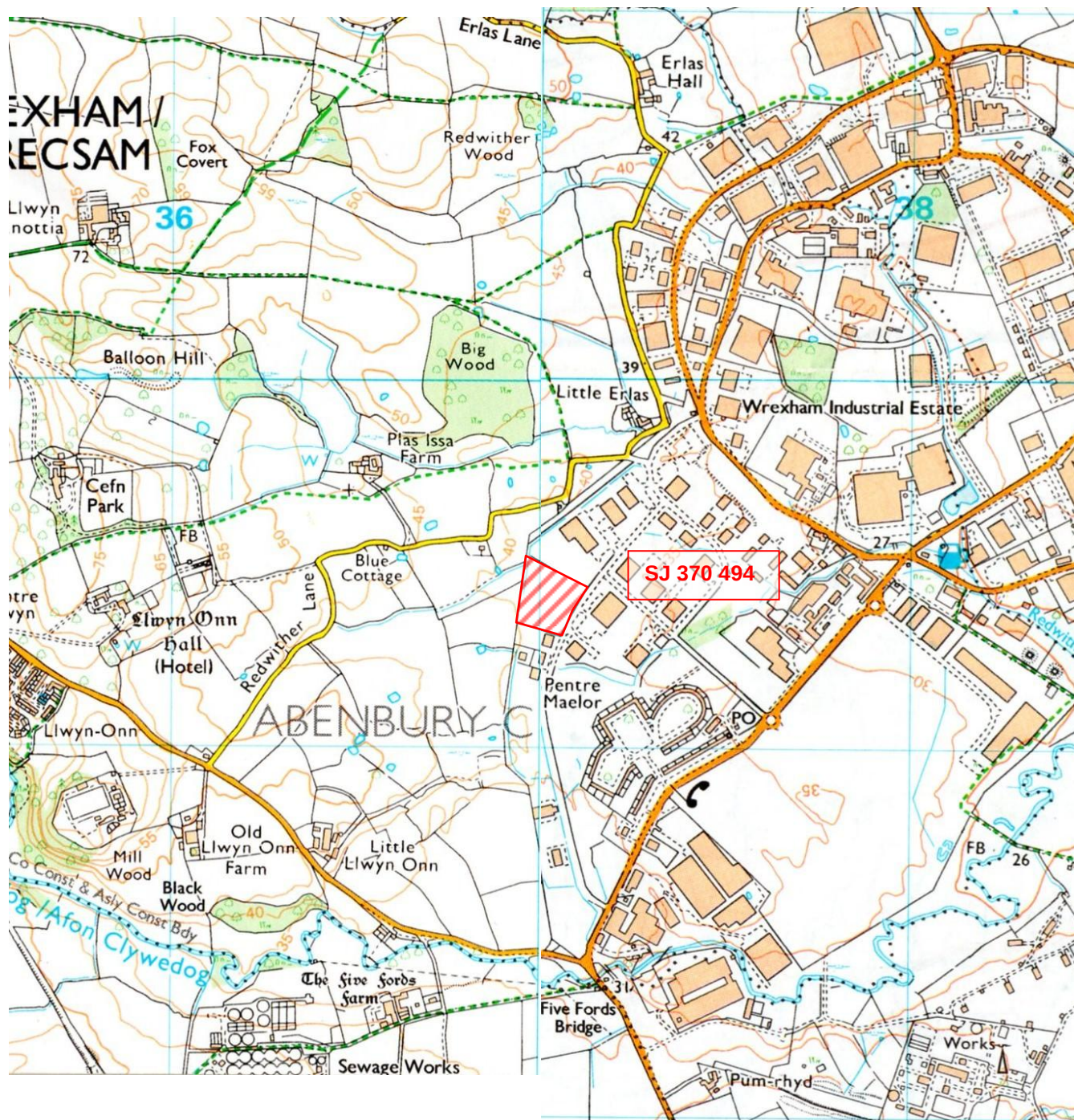
A * equates to Locally Scarce as per Green, 2006.

Plant species
<i>Acer campestre</i> (Field-maple)
<i>Acer pseudoplatanus</i> (Sycamore)
<i>Alnus glutinosa</i> (Alder)
<i>Crataegus monogyna</i> (Hawthorn)
<i>Fraxinus excelsior</i> (Ash)
<i>Ligustrum vulgare</i> (Wild Privet)
<i>Malus domestica</i> agg. (Apple)
<i>Prunus cerasifera</i> (Cherry-plum) *
<i>Prunus spinosa</i> (Blackthorn)
<i>Rosa arvensis</i> (Field-rose)
<i>Rosa canina</i> agg. (Dog-rose)
<i>Quercus robur</i> (Pedunculate Oak)
<i>Salix caprea</i> (Goat Willow)
<i>Salix cinerea</i> (Grey Willow)
<i>Salix</i> cf. <i>fragilis</i> (Crack Willow)
<i>Ulex europaeus</i> (Gorse)
<i>Viburnum opulus</i> (Guelder-rose)
<i>Achillea millefolium</i> (Yarrow)
<i>Achillea ptarmica</i> (Sneezewort)
<i>Agrimonia eupatoria</i> (Agrimony)
<i>Agrostis capillaris</i> (Common Bent)
<i>Agrostis stolonifera</i> (Creeping Bent)
<i>Anthiscus sylvestris</i> (Cow Parsley)
<i>Anthoxanthum odoratum</i> (Sweet-vernal Grass)
<i>Apium nodiflorum</i> (Fool"s Water-cress)
<i>Arrhenatherum elatius</i> (False Oat-grass)
<i>Blackstonia perfoliata</i> (Yellow-wort)
<i>Cardamine pratensis</i> (Cuckooflower)
<i>Carex hirta</i> (Hairy Sedge)
<i>Carex nigra</i> (Common Sedge)
<i>Carex otrubae</i> (False-fox Sedge)
<i>Centaurea nigra</i> (Common Knapweed)

Plant species
<i>Centaureum erythraea</i> (Common Centaury)
<i>Cerastium fontanum</i> (Common Mouse-ear)
<i>Cirsium arvense</i> (Creeping thistle)
<i>Cirsium palustris</i> (Marsh Thistle)
<i>Cirsium vulgare</i> (Spear Thistle)
<i>Cynosurus cristatus</i> (Crested Dog's-tail)
<i>Dactylis glomerata</i> (Cock's-foot)
<i>Dactylorhiza fuchsii</i> (Common Spotted-orchid)
<i>Deschampsia cespitosa</i> (Tufted Hair-grass)
<i>Dryopteris filix-mas</i> (Male-fern)
<i>Elytrigia repens</i> (Common Couch)
<i>Epilobium hirsutum</i> (Great Willowherb)
<i>Epilobium montanum</i> (Broad-leaved Willowherb)
<i>Epilobium parviflorum</i> (Hoary Willowherb)
<i>Equisetum arvense</i> (Field Horsetail)
<i>Festuca rubra</i> (Red Fescue)
<i>Filipendula ulmaria</i> (Meadowsweet)
<i>Galium aparine</i> (Cleavers)
<i>Galium palustre</i> (Marsh Bedstraw)
<i>Geranium dissectum</i> (Cut-leaved Crane's-bill)
<i>Geranium robertianum</i> (Herb-robert)
<i>Glechoma hederacea</i> (Ground-ivy)
<i>Hedera helix</i> (Ivy)
<i>Heracleum sphondylium</i> (Hogweed)
<i>Holcus lanatus</i> (Yorkshire-fog)
<i>Hypericum maculatum</i> (Imperforate St. John's-wort)
<i>Juncus conglomeratus</i> (Compact Rush)
<i>Juncus effusus</i> (Soft-rush)
<i>Juncus inflexus</i> (Hard Rush)
<i>Lactuca serriola</i> (Prickly Lettuce) *
<i>Lathyrus nissolia</i> (Grass Vetchling) *
<i>Lathyrus pratensis</i> (Meadow Vetchling)
<i>Lemna minor</i> (Common Duckweed)
<i>Leucanthemum vulgare</i> (Oxeye Daisy)
<i>Linaria vulgaris</i> (Common Toadflax)
<i>Lotus corniculatus</i> (Common Bird's-foot-trefoil)
<i>Lotus pedunculatus</i> (Greater Bird's-foot-trefoil)
<i>Lychnis flos-cuculi</i> (Ragged-robin)

Plant species
<i>Medicago lupulina</i> (Black Medick)
<i>Mentha aquatica</i> (Water Mint)
<i>Ophioglossum vulgatum</i> (Common Adder's-Tongue) *
<i>Phleum pratense</i> (Timothy)
<i>Phyllitis scolopendrium</i> (Hart's-tongue)
<i>Picris echioides</i> (Bristly Ox-tongue) *
<i>Plantago lanceolata</i> (Ribwort Plantain)
<i>Plantago major</i> (Greater Plantain)
<i>Poa trivialis</i> (Rough Meadow-grass)
<i>Potentilla anserina</i> (Silverweed)
<i>Potentilla reptans</i> (Creeping Cinquefoil)
<i>Primula veris</i> (Cowslip)
<i>Prunella vulgaris</i> (Selfheal)
<i>Pulicaria dysenterica</i> (Common Fleabane)
<i>Ranunculus acris</i> (Meadow Buttercup)
<i>Ranunculus repens</i> (Creeping Buttercup)
<i>Rubus fruticosus</i> agg. (Bramble)
<i>Rumex acetosa</i> (Common Sorrel)
<i>Rumex conglomeratus</i> (Clustered Dock)
<i>Rumex crispus</i> (Curled Dock)
<i>Rumex obtusifolius</i> (Broad-leaved Dock)
<i>Scrophularia nodosa</i> (Common Figwort)
<i>Senecio erucifolius</i> (Hoary Ragwort) *
<i>Senecio jacobaea</i> (Common Ragwort)
<i>Silene dioica</i> (Red Campion)
<i>Silene acaulis</i> (Pepper-saxifrage) *
<i>Sonchus arvensis</i> (Perennial Sowthistle)
<i>Stachys sylvatica</i> (Hedge Woundwort)
<i>Stellaria graminea</i> (Lesser Stitchwort)
<i>Torilis japonica</i> (Upright Hedge-parsley)
<i>Trifolium dubium</i> (Lesser Trefoil)
<i>Trifolium pratense</i> (Red Clover)
<i>Trifolium repens</i> (White Clover)
<i>Urtica dioica</i> (Common Nettle)
<i>Veronica beccabunga</i> (Brooklime)
<i>Vicia cracca</i> (Tufted Vetch)
<i>Vicia hirsuta</i> (Hairy Tare)
<i>Vicia sativa</i> (Common Vetch)

Plant species
<i>Vicia sepium</i> (Bush Vetch)
<i>Vicia tetrasperma</i> (Smooth Tare)



Mapping data licensed from Ordnance Survey with the permission of the Controller of Her Majesty's Stationary Office © Crown copyright 2005. All rights reserved. Licence Number 100046285.



C109 Proposed industrial development, land at Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal

Figure 1 – Site Location

Drawn by: ME
 Checked by: TK
 Date: 23.06.10



Marches Ecology

C109 Proposed industrial development, land at Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal

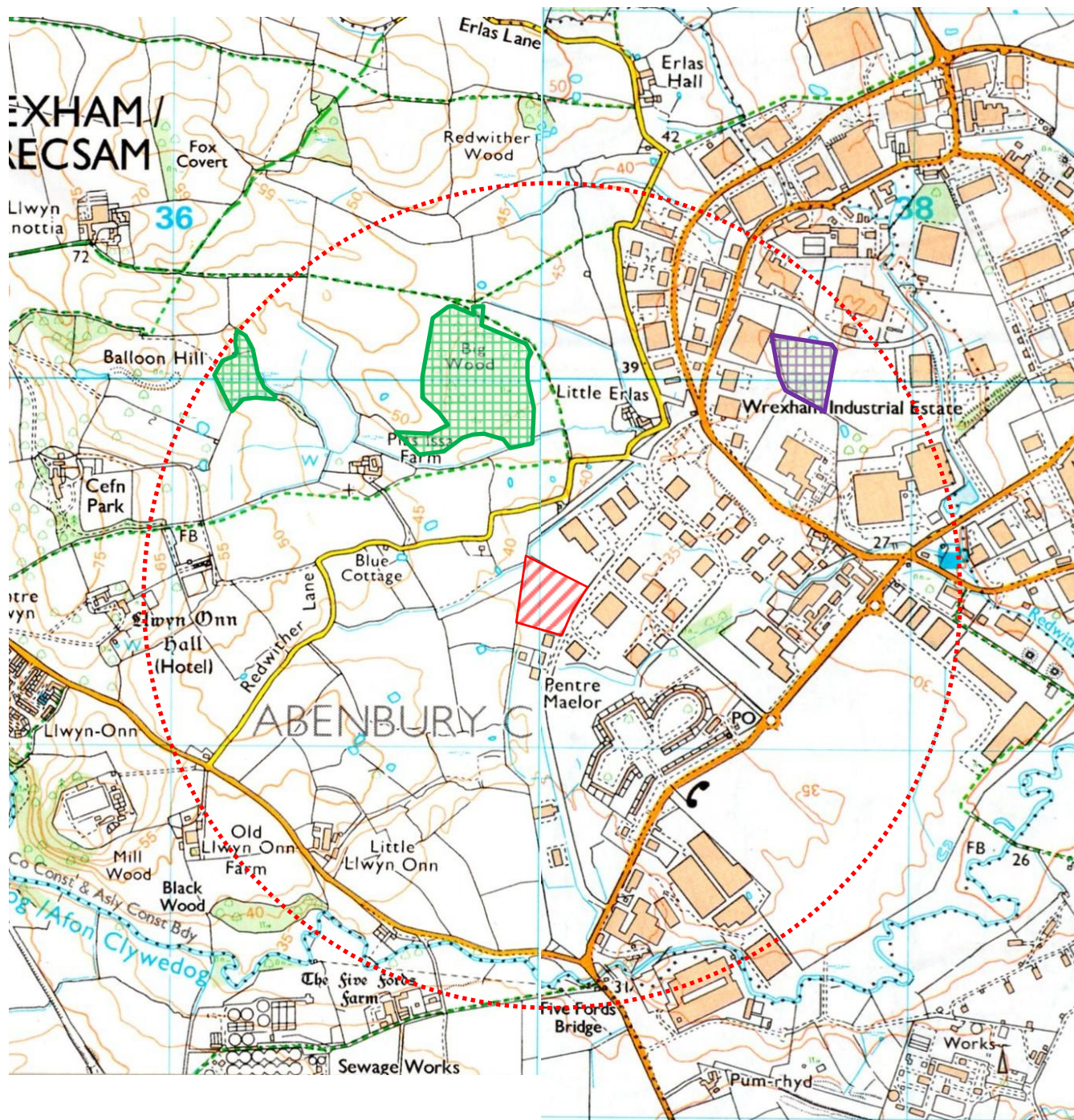
Figure 2 – Extended Phase 1 Habitat Survey

Drawn by: ME
Checked by: TK
Date: 23.06.10

Key

- | | | | |
|--|--|---------------------|-----------------------------|
| | Mixed plantation woodland | A I / | Arable / Improved grassland |
| | Continuous scrub | | Hedgerow |
| | Scattered scrub / individual broad-leaved tree | | Fence |
| | Tall-herb vegetation | | Badger breach |
| | Neutral / Amenity grassland | | Badger path |
| | Hard Standing | | Boundary of survey site |
| | Flowing water | | Target Note |

NB habitats outside of survey site from aerial photography only; individual trees/ shrubs not shown



Mapping data licensed from Ordnance Survey with the permission of the Controller of Her Majesty's Stationary Office © Crown copyright 2005. All rights reserved. Licence Number 100046285.



C109 Proposed industrial development, land at Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal

Figure 3 – Protected Sites Within 1 km of Survey Site

Drawn by: ME
Checked by: TK
Date: 23.06.10

Key



Approximate proposed development site location

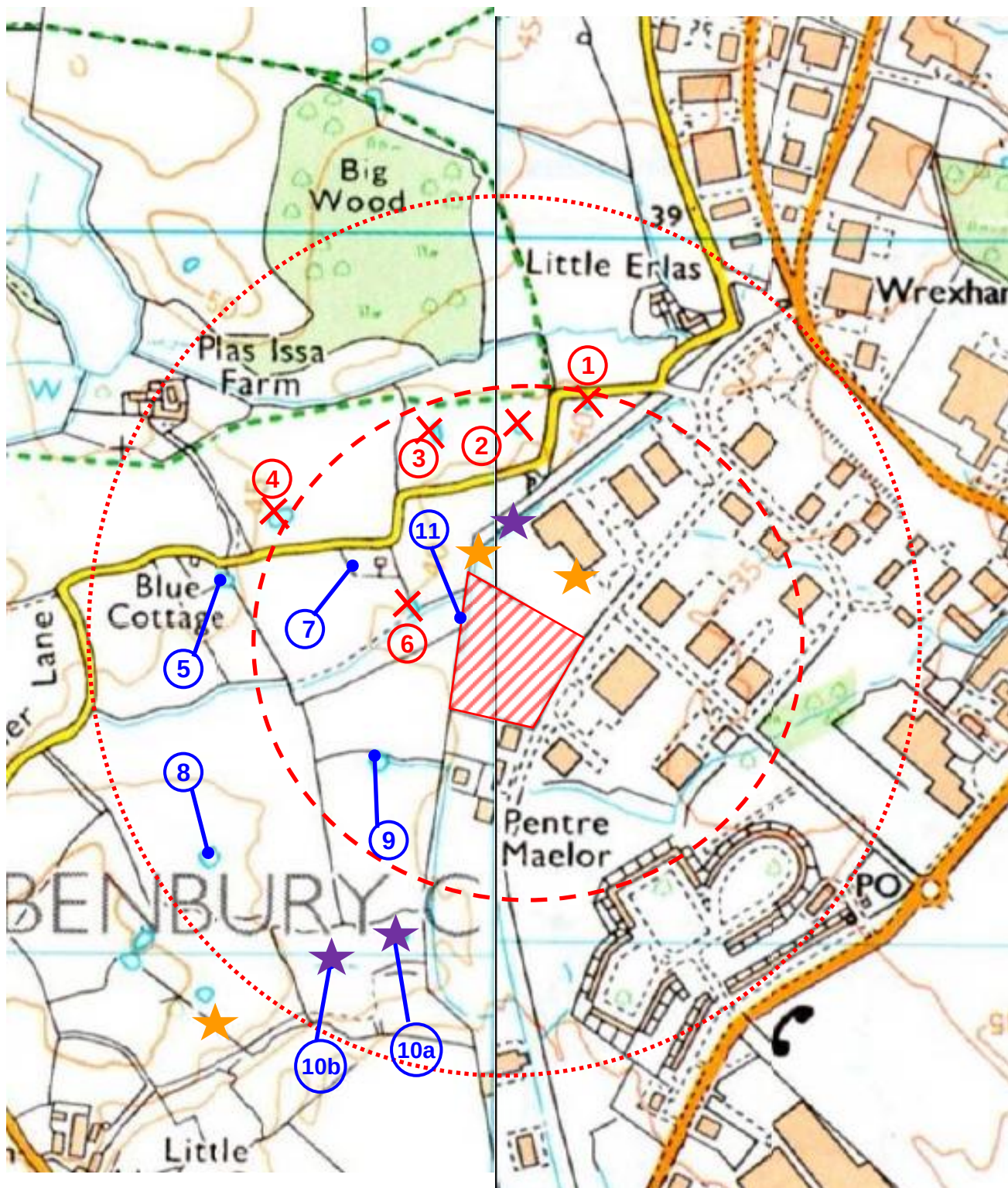


Cefn Park Wildlife Site (W316)



Erlas Black Wood, part of Wrexham Industrial Estate Wildlife Site (W337)

NB – all boundaries are approximate only.



Mapping data licensed from Ordnance Survey with the permission of the Controller of Her Majesty's Stationary Office © Crown copyright 2005. All rights reserved. Licence Number 100046285.

Marches Ecology

C109 Proposed industrial development, land at Clywedog Road South, Wrexham Industrial Estate, Wrexham – Ecological Appraisal

Figure 4 – Ponds and known Great Crested Newt records within 500 m

Drawn by: ME
Checked by: TK
Date: 23.06.10

Key

- Pond location
- X Pond known to be absent
- ★ GCN record (provided by CCW or Biota)
- ★ GCN recorded as part of Ecological Appraisal
- - - / Approximate 250 m / 500 m boundary
- Approximate survey site location