EVERSHEDS

Dated 23rd January 2012

(1) WREXHAM COUNTY BOROUGH COUNCIL

(2) WRG WREXHAM PFI LIMITED

Agreement

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under section 106 of the Town and Country Planning Act 1990 and section 111 of the Local Government Act 1972 relating to land at Wrexham Recycling Park Phase II, Bryn Lane, Wrexham LL13 9UT

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CONTENTS

Clause		Page
1	INTERPRETATION	1
2	EFFECT OF THIS AGREEMENT	4
3	COMMENCEMENT OF OBLIGATIONS	5
4	OBLIGATIONS OF THE PARTIES	5
5	TERMINATION OF THIS AGREEMENT	5
6	NOTICES	6
7	DETERMINATION OF DISPUTES	6
8	JURISDICTION	8
9	EXECUTION	8
Schedules		
1	Developer's Obligations	9
2	Council's Obligations	10
3	Ecological Impact Assessment	11
4	Ecological Management Plan	12
Appendices		
1	PLAN	13

THIS AGREEMENT is made on 23rd January 2012

BETWEEN:

(1) **Wrexham County Borough Council** of Guildhall, Wrexham LL11 1AY ("**the Council**"); and

(2) **WRG Wrexham PFI Limited** (registered number 05572555) whose registered office is at Ground Floor West, 900 Pavilion Drive, Northampton Business Park, Northampton NN4 7RG ("**the Developer**")

BACKGROUND

(A) For the purposes of the 1990 Act, the Council is the local planning authority for the area within which the Site is located and the person who is entitled to enforce the obligations contained in this Agreement.

(B) The Council is the freehold owner of the whole of the Site.

(C) The Developer and the Council will enter into the Project Agreement in respect of the Development.

(D) The Project Agreement will provide that the Council grant a lease to the Developer for the Development Land upon the satisfaction of certain conditions and obligations contained therein.

(E) Pursuant to the Planning Application Waste Recycling Limited has applied to the Council for planning permission for the Development

(F) The Council supports the Development but is unable or unwilling to approve the Planning Application or to grant the Planning Permission in the absence of this Agreement which makes provision for regulating the Development and securing the matters referred to in this Agreement.

(G) The parties have agreed to enter into this Agreement with the intention that the obligations contained in this Agreement may be enforced by the Council against the Developer and its successors in title.

OPERATIVE PROVISIONS

1. **INTERPRETATION**

1.1 In this Agreement, the following words and expressions have the following meanings:

"1990 Act"	the Town and Country Planning Act 1990 (as amended)
"Commencement Date"	the date on which the Development commences by the carrying out on the Site pursuant to the Planning Permission of a material operation as specified in section 56(4) of the 1990 Act **Save That** the term *"material operation"* shall not include operations in connection with any work of or associated with environmental investigation site and soil surveys erection of contractors

	work compound erection of contractor's site office erection of fencing to site boundary and the implementation of the Ecological Impact Assessment and the Ecological Management Plan and "Commencement of Development" shall be construed accordingly;
"Commencement of Commercial Operations"	the date upon which the Development has been fully constructed and it first accepts waste for treatment
"Development"	the development of the Development Land as a mechanical biological treatment facility, including road sweepings processing facility, ancillary offices and welfare facility
"Development Land"	the part of the Site shown edged red on the Plan
"Ecological Impact Assessment"	the document annexed to this Agreement at Schedule 4 entitled 'Wrexham Recycling Park Phase II, Bryn Lane, Wrexham Industrial Estate - Ecological Impact Assessment' prepared by Marches Ecology on behalf of Stratus Environmental Limited and dated September 2011 specifying the works (including landscaping) to make the Ecological Mitigation Area comply with the requirements of the Countryside Council for Wales and/or the local planning authority together with any amendments to the document as approved in writing by the local planning authority at any time
"Ecological Management Plan"	the document annexed to this Agreement at Schedule 5 entitled 'Wrexham Recycling Park Phase II, Bryn Lane - Ecological Management Plan' prepared by Marches Ecology on behalf of Stratus Environmental Limited dated December 2011 addressing the management and maintenance of the Ecological Mitigation Area following the implementation of the proposals set out in the Ecological Impact Assessment together with any amendments to the document as approved in writing by the local planning authority at any time
"Ecological Mitigation Area"	the part of the Site shown edged green on the Plan
"Lease"	the lease of the Development Land to be granted by the Council to the Developer pursuant to the Project Agreement

"Managing Body"	the party or parties who shall undertake the management and maintenance of the Ecological Mitigation Area as approved in writing by the Council
"Managing Body Approval Fee"	the Council's reasonable and proper costs in assessing and approving the details of the Managing Body
"New Permission"	a planning permission authorising the redevelopment of the Site in a manner which would, if such redevelopment were completed, cause the Developer to be in breach of any or all of the provisions contained in this Agreement
"Plan"	the plan attached to this Agreement at Appendix 1
"Planning Application"	an application for planning permission for the carrying out of the Development made by the Developer on 12 September 2011 carrying the reference P/2011/0769
"Planning Permission"	the planning permission to be granted in pursuance of the Planning Application
"Project Agreement"	the contract to be entered into between the Council and the Developer setting out the rights and obligations of the parties in respect of the provision of an integrated waste management service and related activities throughout the administrative area of the Council
"Site"	the freehold property known as land at Bryn Lane, Wrexham registered at HM Land Registry under the Title Numbers
"Specialist"	has the meaning given to it in clause 7.2
"Title Numbers"	WA34535, WA4223 and CYM336244
"Waste Recycling Limited"	means the operator sub-contracted by the Developer to operate the integrated waste management service and related activities to be provided on the Development Land pursuant to the Project Agreement

1.2 In this Agreement:

1.2.1 the clause headings do not affect its interpretation;

1.2.2 unless otherwise indicated, references to clauses and Schedules are to clauses of and Schedules to this Agreement and references in a Schedule to a Part or paragraph are to a Part or paragraph of that Schedule;

1.2.3 references to any statute or statutory provision include references to:

1.2.3.1 all Acts of Parliament and all other legislation having legal effect in the United Kingdom as directly or indirectly amended, consolidated, extended, replaced or re-enacted by any subsequent legislation; and

1.2.3.2 any orders, regulations, instruments or other subordinate legislation made under that statute or statutory provision;

1.2.4 references to the Site include any part of it;

1.2.5 references to any party in this Agreement include the successors in title of that party. In addition, references to the Council include any successor local planning authority exercising planning powers under the 1990 Act;

1.2.6 "including" means "including, without limitation";

1.2.7 any covenant by the Developer not to do any act or thing includes a covenant not to permit or allow the doing of that act or thing;

1.2.8 where two or more people form a party to this Agreement, the obligations they undertake may be enforced against them all jointly or against each of them individually; and

1.2.9 if any provision is held to be illegal, invalid or unenforceable, the legality, validity and enforceability of the remainder of the Agreement is to be unaffected.

1.3 The parties to this Agreement do not intend that any of its terms will be enforceable by virtue of the Contracts (Rights of Third Parties) Act 1999 by any person not a party to it.

2. EFFECT OF THIS AGREEMENT

2.1 This Agreement is made pursuant to section 106 of the 1990 Act. To the extent that they fall within the terms of section 106 of the 1990 Act, the obligations contained in this Agreement are planning obligations for the purposes of section 106 of the 1990 Act and are enforceable by the Council.

2.2 To the extent that any of the obligations contained in this Agreement are not planning obligations within the meaning of the 1990 Act, they are entered into pursuant to the powers contained in section 111 of the Local Government Act 1972, section 2 of the Local Government Act 2000 and all other enabling powers.

2.3 Nothing in this Agreement restricts or is intended to restrict the proper exercise at any time by the Council of any of its statutory powers, functions or discretions in relation to the Site or otherwise.

2.4 It is agreed by the parties that the Council's interest in the Site will only become bound by the obligations and restrictions set out in this Agreement upon the transfer of a freehold interest or the grant of a leasehold interest to any successors in title for the purpose of the Development and the Council covenants (in its capacity as landowner) that it will ensure that as part of any grant it will require a deed to be executed by the transferee or lessee in order to bind the

transferee or lessee and their successors in title to the obligations contained in this Deed.

2.5 This Agreement will be registered as a local land charge by the Council.

2.6 Nothing in this Agreement prohibits or limits the right to develop any part of the Site in accordance with a planning permission, other than one relating to the Development as specified in the Planning Application, granted after the date of this Agreement, whether or not pursuant to an appeal.

3. COMMENCEMENT OF OBLIGATIONS

3.1 The obligations contained in this Agreement will come into effect on the Commencement Date unless otherwise specifically indicated in this Agreement.

4. OBLIGATIONS OF THE PARTIES

4.1 The Developer agrees with the Council to comply with the obligations set out in Schedule 1 in relation to the Development.

4.2 The Council agrees with the Developer to comply with the obligations set out in Schedule 2.

4.3 The Council agrees with the Developer that it will issue the Planning Permission as soon as reasonably practicable after the date of this Agreement.

4.4 The Developer covenants that with effect from the date upon which the Developer acquires the Lease the terms of this Agreement shall be binding upon and enforceable against the Developer in respect of the leasehold interest in the Development Land created by the Lease and the Developer shall immediately following the acquisition of the Lease give notice thereof to the Council and simultaneously enter into an agreement supplemental to this Agreement on terms identical to the provisions of this Agreement (subject to any amendments the Council and the Developer shall agree) in order to bind the leasehold interest in the Development Land created by the Lease by the terms of this Agreement.

4.5 Unless otherwise agreed by the Council, the Developer shall not implement the Development unless and until the leasehold interest in the Development Land is bound by the terms of this Agreement.

4.6 The Council agrees with the Developer that it will act reasonably, properly and diligently in exercising its discretion and discharging its functions under this Agreement.

4.7 No person will be liable for any breach of the terms of this Agreement occurring after the date on which they part with their interest in the Site or the part of the Site in respect of which such breach occurs, but they will remain liable for any breaches of this Agreement occurring before that date. Neither the reservation of any rights or the inclusion of any covenants or restrictions over the Site in any transfer of the Site will constitute an interest for the purposes of this clause 4.7.

5. TERMINATION OF THIS AGREEMENT

5.1 This Agreement will come to an end if:

5.1.1 subject to clause 5.2, the Planning Permission is quashed, revoked or otherwise withdrawn before the Commencement Date;

5.1.2 the Planning Permission expires before the Commencement Date without having been implemented; or

5.1.3 at any time after the date of the this Agreement, the Council or any other competent authority grants a New Permission under which development is implemented for the purposes of section 56 of the 1990 Act.

5.2 **Clause 5.1.1** will not apply in respect of any minor modifications to the Planning Permission or the Development agreed from time to time between the Council and the Developer prior to the Commencement Date

5.3 Where the Agreement comes to an end under clause 5.1, the Council is, on the written request of the Developer, to issue written confirmation thereof to the Developer within a reasonable time and to vacate or cancel the entry made in the Local Land Charges register in relation to this Agreement.

6. NOTICES

6.1 Any notice, demand or any other communication served under this Agreement will be effective only if delivered by hand or sent by first class post, pre-paid or recorded delivery.

6.2 Any notice, demand or any other communication served is to be sent to the address of the relevant party set out at the beginning of this Agreement or to such other address as one party may notify in writing to the others at any time as its address for service.

6.3 Unless the time of actual receipt is proved, a notice, demand or communication sent by the following means is to be treated as having been served:

6.3.1 if delivered by hand, at the time of delivery;

6.3.2 if sent by post, on the second working day after posting; or

6.3.3 if sent by recorded delivery, at the time delivery was signed for.

6.4 If a notice, demand or any other communication is served after 4.00 pm on a working day, or on a day that is not a working day, it is to be treated as having been served on the next working day.

6.5 For the avoidance of doubt, where proceedings have been issued in the Courts of England and Wales, the provisions of the Civil Procedure Rules must be complied with in respect of the service of documents in connections with those proceedings.

7. DETERMINATION OF DISPUTES

7.1 Subject to clause 7.7, if any dispute arises relating to or arising out of the terms of this Agreement, either party may give to the other written notice requiring the dispute to be determined under this clause 7. The notice is to propose an appropriate Specialist and specify the nature and substance of the dispute and the relief sought in relation to the dispute.

7.2 For the purposes of this clause 7 a "Specialist" is a person qualified to act as an expert in relation to the dispute having not less than ten years' professional

experience in relation to developments in the nature of the Development and property in the same locality as the Site.

7.3 Any dispute over the type of Specialist appropriate to resolve the dispute may be referred at the request of either party to the President or next most senior available officer of the Law Society who will have the power, with the right to take such further advice as he may require, to determine the appropriate type of Specialist and to arrange his nomination under clause 7.4.

7.4 Any dispute over the identity of the Specialist is to be referred at the request of either party to the President or other most senior available officer of the organisation generally recognised as being responsible for the relevant type of Specialist who will have the power, with the right to take such further advice as he may require, to determine and nominate the appropriate Specialist or to arrange his nomination. If no such organisation exists, or the parties cannot agree the identity of the organisation, then the Specialist is to be nominated by the President or next most senior available officer of the Law Society.

7.5 The Specialist is to act as an independent expert and his decision shall be final and binding on all the parties (save for manifest error) but before making his decision:

7.5.1 each party may make written representations within ten working days of his appointment and will copy the written representations to the other party;

7.5.2 each party is to have a further ten working days to make written comments on the other's representations and will copy the written comments to the other party;

7.5.3 the Specialist is to be at liberty to call for such written evidence from the parties and to seek such legal or other expert assistance as he or she may reasonably require;

7.5.4 the Specialist is not to take oral representations from the parties without giving both parties the opportunity to be present and to give evidence and to cross-examine each other;

7.5.5 the Specialist is to have regard to all representations and evidence before him when making his decision, which is to be in writing, and is to give reasons for his decision; and

7.5.6 the Specialist is to use all reasonable endeavours to publish his decision within 30 working days of his appointment.

7.6 Responsibility for the costs of referring a dispute to a Specialist under this clause 7, including costs connected with the appointment of the Specialist and the Specialist's own costs, but not the legal and other professional costs of any party in relation to a dispute, will be decided by the Specialist.

7.7 This clause 7 does not apply to disputes in relation to matters of law or the construction or interpretation of this Agreement which will be subject to the jurisdiction of the courts.

8. **JURISDICTION**

8.1 This Agreement is to be governed by and interpreted in accordance with the law of England and Wales.

8.2 The courts of England and Wales are to have jurisdiction in relation to any disputes between the parties arising out of or related to this Agreement.

9. **EXECUTION**

The parties have executed this Agreement as a deed and it is delivered on the date set out above.

SCHEDULE 1

Developer's Obligations

1. **Ecological Mitigation Area**

1.1 Prior to the Commencement Date the Developer shall submit to the Council for approval details of the Managing Body who is to undertake the management and maintenance of the Ecological Mitigation Area pursuant to the Ecological Management Plan. For the avoidance of doubt, this obligation shall not preclude the Developer from submitting details of an alternative Managing Body to the Council for approval at any stage.

1.2 Prior to the Commencement Date the Developer shall pay to the Council the Managing Body Approval Fee.

1.3 Prior to the Commencement Date the Developer shall implement the approved Ecological Impact Assessment and procure the implementation by the Managing Body of the Ecological Management Plan.

1.4 The Ecological Mitigation Area shall be managed in accordance with the Ecological Management Plan for a period of 24 years from the Commencement of Commercial Operations or such lesser period that the Developer has control of the Development Land under the Lease.

SCHEDULE 3

Ecological Impact Assessment

Report Title	Wrexham Recycling Park Phase II, Bryn Lane, Wrexham Industrial Estate - Ecological Impact Assessment
Client	Stratus Environmental Ltd
Date	September 2011

this report was produced by

Marches Ecology

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Registered address: Unit 23, The Malthouse Business Centre, Regent Street, Llangollen, Denbighshire, LL20 8HS.

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	Wrexham Recycling Park Phase II, Bryn Lane, Wrexham Industrial Estate - Ecological Impact Assessment
Client	Stratus Environmental Ltd
Marches Ecology Ref	C170/EcIA/Final
Date issued	7th September 2011
Authors	Tom Knight and Max Ellson

CONTENTS

1 INTRODUCTION 4
1.1 PROJECT BACKGROUND 4
1.2 HISTORIC ECOLOGICAL SURVEYS 5
1.3 THE PROPOSED PHASE II DEVELOPMENT 6
1.4 STRUCTURE OF THIS REPORT 6
2 METHODOLOGY 7
2.1 EXTENDED PHASE 1 HABITAT SURVEY 7
2.2 FAUNAL SURVEYS 8
2.3 SITE EVALUATION 13
3 ECOLOGICAL BACKGROUND DATA SEARCH 14
3.1 APPROACH 14
3.2 FINDINGS 16
4 RESULTS 20
4.1 INTRODUCTION 20
4.2 SITE DESCRIPTION 20
4.3 HABITATS AND FLORA 20
4.4 FAUNA 24
5 EVALUATION 36
5.1 INTRODUCTION 36
5.2 HABITATS AND FLORA 36
5.3 FAUNA 39
5.4 SUMMARY OF ECOLOGICAL VALUE 44
6 IMPACT ASSESSMENT 46
6.1 ASSESSMENT METHODOLOGY 46
6.2 IDENTIFICATION AND ASSESSMENT OF IMPACTS 49
6.3 MITIGATION AND REASONABLE AVOIDANCE MEASURES 63
6.4 RESIDUAL IMPACTS 73
6.5 CONCLUSIONS 78
7 TARGET NOTES 79
8 REFERENCES 83
9 DATA 86
10 KEY LEGISLATION AND REGULATIONS 92

Figure 1 – Site Location
Figure 2 – Extended Phase 1 Habitat Survey
Figure 3 – Wildlife Sites
Figure 4 – Ponds and Known Great Crested Newt records within 500 m of the Survey Site

Appendix 1 – Data provided by Cofnod (Public Version)

1 INTRODUCTION

1.1 Project Background

1.1.1 Marches Ecology was commissioned by Stratus Environmental Ltd to undertake an Ecological Impact Assessment (EcIA) of the proposed development of Phase II of Wrexham Recycling Park on the former Georgia Pacific site, off Bryn Lane, Wrexham Industrial Estate, Wrexham (OS Grid Ref.: 338775, 349908). The proposal briefly concerns construction of a Mechanical Biological Treatment Facility, short access road, hard-standing and associated infrastructure and a small-scale solar panel array. This EcIA is provided in support of the planning application. The location of the proposed site is shown in *Figure 1*.

1.1.2 The area of land to which this report relates was the subject of a range of ecological surveys in 2007 undertaken to inform the Ecological Impact Assessment of Phase I of the Wrexham Recycling Park (Marches Ecology 2007a & b). The following ecological surveys were completed at that time:

- An Extended Phase 1 Habitat Survey;
- A botanical update survey;
- A Badger (*Meles meles*) survey;
- A Water Vole (*Arvicola amphibius*, formerly *A. terrestris*)/ Otter (*Lutra lutra*) survey;
- A bat survey;
- A reptile survey;
- A Great Crested Newt (*Triturus cristatus*) survey; and
- A breeding bird survey.

1.1.3 A walkover survey of the Phase II site was completed on 25th May 2009 to update and review the findings of this earlier ecological survey work to inform assessment of then proposed remediation works (on behalf of Wrexham County Borough Council). Subsequent to this a number of surveys were undertaken in 2010 to inform an EcIA for the Phase II proposal. However the proposal was not taken forward at this time and the surveys were not formally reported. The scope and extent of the surveys completed in 2010 were discussed and agreed with Emma Broad (Wrexham County Borough Council, Biodiversity Officer) and Matthew Ellis (Countryside Council for Wales, Regional Species and Biodiversity Officer) and were as follows:

- A general walkover/ Extended Phase 1 Habitat Survey update;
- A Great Crested Newt survey of the ditch on the western boundary of the site. Due to seasonal and timing constraints, only three visits were completed (although this was considered acceptable at the time by both Matthew Ellis and Emma Broad);
- A Badger survey update;
- A nesting bird survey. Due to seasonal and timing constraints, only two visits were completed (although this was considered acceptable at the time by both Matthew Ellis and Emma Broad); and
- A Water Vole and Otter survey update.

1.1.4 A walkover survey has been completed in 2011 to inform this current proposal and EcIA. This approach was again discussed and agreed with Matthew Ellis and Emma Broad. The survey data used for this assessment is based primarily on that obtained in 2007 and 2010.

The 2011 walkover survey concerned the area of land to the east/ south of the ditch only as shown on *Figure 1.*

1.1.5 This report presents the findings of the ecological surveys outlined in *paragraphs 1.1.2* and *1.1.3.* It contains assessment of the potential impacts on the ecological resource with reference to the ecological data collected. An Ecological Background Data Search to collate existing ecological information was also completed in 2007. However this search was updated in 2011; the results of which are presented in *Section 3.* An associated confidential Badger Survey Annex (Marches Ecology, 2011b) has also been produced. The Badger Survey Annex compliments this EcIA report and these documents should be considered together.

1.2 Historic Ecological Surveys

1.2.1 A Wildlife Survey was completed by Cass Associates for a planning application submission in 2004 (Cass Associates 2004a). This survey concerned a similar area to that surveyed in 2007 by Marches Ecology including the Phase II site. The report evaluated the habitats present for their potential suitability for a number of species that receive specific legal protection. The following species/ species groups were either found to be present on the site or habitat capable of supporting them was recorded:

- Great Crested Newt – the likelihood of the presence of this species was considered to be low;
- Reptiles – the habitat was assessed as being potentially suitable for common reptiles;
- Bats – the habitat was assessed as being potentially suitable as a foraging resource. In addition a single ivy-covered *Quercus robur* (Pedunculate Oak) tree was identified as having potential for roosting bats; and
- Barn Owl (*Tyto alba*) – the habitat on the site was assessed as potentially providing a valuable foraging resource.

The survey report was subsequently appended to the Planning Statement (Cass Associates 2004b).

1.2.2 An Ecological Survey and Assessment Report was produced on behalf of Waste Recycling Group by SLR Consulting in January 2007 (SLR 2007). This survey included all of the land within the Phase I and II sites. The report evaluated the habitat present for its potential suitability for a number of species that receive specific legal protection. The following species/ species groups were either found to be present on the site or habitat capable of supporting them was recorded:

- Great Crested Newt – a single adult female was recorded in terrestrial habitat in land to the west of the survey site [now occupied by Phase I: a Waste Recycling and Composting Facility];
- Reptiles – the habitat was assessed as being potentially suitable for common reptiles;
- Water Voles – no signs were recorded and the ditch was assessed as being of low value;
- Bats – the habitat was assessed as being potentially suitable as a foraging resource. In addition a single mature Pedunculate Oak tree was identified as having high or moderate potential for roosting bats [located within the Phase I site];

- Badgers – the site was assessed as being of minimal value for this species; and
- Birds – the habitat was assessed as being potentially suitable for use by a variety of widespread bird species.

1.3 The Proposed Phase II Development

1.3.1 A detailed description of the proposed development is provided in Chapter 3 of the Environmental Statement (ES) that accompanies this planning application. The proposed Mechanical Biological Treatment (MBT) facility is Phase II of Wrexham Recycling Park. The MBT facility will have the capacity to process approximately 70,000 tpa of household residual waste, street cleansing waste, as well as Household Recycling Centre waste and commercial and industrial waste. The MBT process will include the recovery of materials such as metals, plastics and paper, followed by stabilisation through biological treatment, and production of two grades of Solid Recovered Fuel (SRF). The individual recyclable materials and clean residual material (SRF) will be stored separately, prior to offsite removal.

1.3.2 All discharged air from the various processes will pass through a biofilter before being released to the air via a 14 metre high discharge stack. The discharged air is guided through a biofilter to reduce the odour before external discharge.

1.3.3 The facility also includes a plant to treat Gulley Waste and sewer grit arisings, removing organic contaminants from the grits to produce a usable product or an inert waste with minimal moisture content, which in turn minimises transport and disposal costs. The grit washing plant will be fully enclosed to minimise odour release, but any odour that may be released into the building will be treated by the biofilter prior to release from the 14 meter high chimney, to avoid the fugitive release of potentially offensive odour from the process.

1.3.4 A 'ground-frame' mounted solar panel array is proposed along the southern boundary of the existing Household Recycling Centre (HRC) and adjacent to the Phase I site. The array would be located over an area of existing amenity grassland extending to approximately 300 m^2. Further detail is provided on a plan entitled 'Solar Array Layout and Mounting Details', (Dwg. No. WR7042/19/17) included elsewhere as part of this submission. The planning application boundary is shown on a plan entitled 'Existing Topographical Survey and Planning Application Boundary' (Dwg. No. WR7042/19/03) included elsewhere as part of this submission.

1.4 Structure of this Report

1.4.1 The remainder of this report is structured as follows:

Section 2 describes the survey methodology and scope;
Section 3 presents details with regards the ecological background data search;
Section 4 describes the results of the ecological surveys;
Section 5 presents the evaluation;
Section 6 presents the impact assessment and outlines mitigation measures; and
Section 7 contains the target notes.

Further sections give references, tables of data and a summary of key legislation.

2 METHODOLOGY

2.1 Extended Phase 1 Habitat Survey

2.1.1 An Extended Phase 1 Habitat Survey was carried out on 21st and 22nd March 2007 by Tom Knight and Max Ellson of Marches Ecology. This included the area of land which is the subject of this report (Phase II), as well as further land to the north and west (Phase I); only the relevant details for the survey site (hereon referred to as 'the survey site') and 'immediately adjacent land' are included within this report. The boundary of the survey site is shown on *Figure 1.* The weather was sunny and warm on the 21st and cloudy with light rain showers following overnight rain on the 22nd. Light winds were recorded on both days. A walkover survey of the survey site (as indicated on *Figure 1*) was conducted on 25th May 2009 by Tom Knight of Marches Ecology in order to update the relevant findings of the 2007 survey. The weather was warm and dry with a light breeze. This walkover survey was repeated on 7th and 8th July 2010 by Max Ellson and 24th June 2011 by Tom Knight and Max Ellson. The weather in 2010 was warm and cloudy with light rain while in 2011 it was warm and dry with a light breeze. The walkover survey conducted in 2011 covered the current application site with the exception of the proposed access road as this is characterised by existing hard-standing and the proposed location of the solar panel array which is characterised by managed amenity grassland. The planning application boundary is shown on a plan entitled 'Existing Topographical Survey and Planning Application Boundary' (Dwg. No. WR7042/19/03) included elsewhere as part of this submission.

2.1.2 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.

2.1.3 This basic survey has been adapted as 'extended' Phase 1 Habitat Survey where more information is required 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 maps, called target notes. Target notes are recorded for habitat and features of possible botanical interest and features relating to animals including protected vertebrates.

2.1.4 In addition to the habitat maps and target notes, a plant species list was compiled (*Table 19* in *Section 9*). Plant nomenclature in this report follows Stace (2010).

2.1.5 A botanical survey, to complement the Extended Phase 1 Habitat Survey, was completed in July 2007. Although it is unrealistic to suppose that walk-through surveys can generate

completely exhaustive species lists, the list in this report indicates the character of the vegetation and the ecological value of the area inspected.

2.1.6 Habitats and other features were assessed for protected and other notable vertebrates that are likely to occur in the region and within the survey site. Evidence of activity was noted when encountered. In addition a subjective assessment of the relative ecological value of the survey site, based on professional experience, was completed. Further information describing the methods employed for particular species where deemed relevant to the site are provided in *Section 2.2* (Sub-sections entitled '*Habitat Assessment*'). Target notes were made for features of interest, and these are given in *Section 7* and mapped on *Figure 2*.

2.1.7 Target notes in this report largely utilise the original numbers generated for the 2007 survey.

2.2 Faunal Surveys

General

2.2.1 Faunal surveys were carried out in 2007 with some being updated in 2010. These focused on both the area of land which is the subject of this report, as well as further land to the north; only the relevant details for the survey site and immediately adjacent land are included within this report.

Badger

2.2.2 Information and results pertaining to Badgers is included within a confidential annex to this report (Marches Ecology, 2011b).

Bats

Habitat Assessment

2.2.3 Initial survey for bats during the Extended Phase 1 Habitat Survey involved making an assessment of the habitat for foraging, and assessing locations for roosting. Trees are briefly described and features that increase the likelihood of them being used for roosting are identified (given as Target Notes in *Section 7*). If any definite signs of bats had been found (such as droppings and feeding remains), they would have been recorded.

2.2.4 A general assessment of trees within the survey site was completed. A brief external inspection of large trees within the survey area was completed, employing binoculars and a powerful torch where necessary. No ladders or other climbing equipment were used during this assessment work. 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. It should not be considered an exhaustive survey of the trees. The methodology for this bat assessment work was carried out from surveyor experience and followed methodologies adapted from Bat Conservation Trust (2007).

Assessment of Bat-roost Potential

2.2.5 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.

2.2.6 There are no buildings present within the survey site.

Detailed Survey

2.2.7 The survey was conducted by Mr. S. Irwin, a licensed bat surveyor (CCW Bat Licence number OTH:CSAB:46:2006; at the time of survey). Three nocturnal surveys were conducted by two surveyors between May to July 2007 at which time bats will be present in maternity colonies and generally foraging within close proximity to roosts. At the start of the first visit habitat within the surveyed area was assessed to determine potential suitability for foraging, commuting and roosting bats. The assessment was conducted in good light, approximately two hours before sunset. The following assessment criteria were used:

- surrounding habitat;
- temperature stability;
- protection from the elements;
- construction detail;
- potential roosting locations; and
- potential bat-access points.

2.2.8 Properties or structures in close proximity to the survey site were appraised for bat roost potential as developments can impact upon roosts outside of a development area where foraging habitat is to be removed. The transect and emergence surveys undertaken in 2007 focused on both the Phase I and Phase II sites. Only the results of the surveys undertaken within the survey site (Phase II) are considered in this report unless relevant to the assessment.

2.2.9 Where tree roost potential exists dusk emergence observations were undertaken during the first part of the nocturnal visits. During the anticipated roost emergence period static observations were implemented to establish if any bats emerged from any mature trees

located in the survey site; this procedure was repeated on each of the three nocturnal visits. Emergence surveys were followed by variable transects across the site and these were conducted by two surveyors using standard heterodyne and time expansion bat detectors. The surveyors covered different parts of the site and communicated via two-way radio about bat movements at any given point in order to capture as much information as possible about bat activity.

2.2.10 Successful recording of bat echolocations was analysed with computer software to check for and verify species.

Water Vole

Habitat Assessment

2.2.11 During the Extended Phase 1 Habitat Survey habitat was assessed to determine its potential suitability for Water Voles. 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*).

Detailed Survey

2.2.12 A Water Vole survey was completed on May 19th 2007 by Tom Knight and Max Ellson of Marches Ecology. Tom Knight holds a Countryside Council for Wales (CCW) 'disturbance' licence (No. OTH:SA:141:2007; at the time of survey). The Water Vole survey was repeated on 8th June 2010 by Max Ellson. April to early October is the optimal period for finding Water Vole breeding territories which are marked by latrines (Strachan & Moorhouse 2006).

2.2.13 The Water Vole survey method was adapted from that described in Strachan & 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).

Otter

2.2.14 The Otter survey was conducted at the same time as the Water Vole survey in both 2007 and 2010. It broadly followed the methods outlined in NRA 1993 and Chanin (2003a). The area surveyed is mapped along with the positions and densities of spraints, feeding remains, footprints, holts, couches, and other field signs.

Great Crested Newt

Habitat Assessment

2.2.15 The quality of terrestrial and aquatic habitat for Great Crested Newt 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).

Population Estimate Survey

2.2.16 A Great Crested Newt population estimate survey was undertaken in 2007 of several nearby waterbodies including:

- the ditch that forms part of the northern/ western boundary of the survey site;
- a small seasonal waterbody adjacent to the spoil tip in the Phase II site;
- a pond to the north of the Household Recycling Centre (located within the Phase I site); and
- three ponds to the west of the site (adjacent to Bridge Road North), two by Redwither Tower and one within the land ownership of Isringhausen.

2.2.17 Normally survey for Great Crested Newts in relation to a development proposal (or similar) is extended to include all potentially suitable waterbodies within 500 m of the site boundary. At the time of the 2007 surveys, Matthew Ellis indicated that the Countryside Council for Wales (CCW) retained sufficient current data on the ponds within 500 m of the proposed development site. This data was subsequently provided and it was agreed that it was not necessary to extend the survey further.

2.2.18 The 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. A minimum of six counts is completed for a population estimate. At least four of these visits should be undertaken between 10th April and 15th May.

2.2.19 Both Tom Knight and Max Ellson hold Countryside Council for Wales (CCW) Great Crested Newt 'survey/disturbance' licences (Tom Knight No. OTH:SA:140:2006 and Max Ellson No. OTH:SA:101:2007; at the time of the survey).

2.2.20 An update survey of the ditch that forms the western boundary of the Phase II site was completed in 2010. Three visits were undertaken at this time by Tom Knight and Max Ellson (Licence nos. Tom Knight 22000:OTH:SA:2010 and Max Ellson 20679:OTH:SA:2010; at the time of the survey).

Reptiles

Habitat Assessment

2.2.21 Areas that are potentially suitable for reptiles, including potential basking areas, hibernation sites and foraging habitat were identified during the Extended Phase I Habitat Survey. 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 Edgar *et al.* (2010):

- 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.

Presence/ Absence Survey

2.2.22 A reptile presence/absence survey was completed during April to May 2007. Although reptiles are largely active between March and October, the best survey months tend to be April - June and September. A total of thirty-two artificial refugia (a combination of 0.5 m^2 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 I Habitat Survey. These refugia are then re-visited during the survey period and all reptiles found recorded.

2.2.23 When walking between refuges the surveyor notes down any reptiles seen as some species do not use refuges as readily as others. Froglife (1999) indicates that for general survey purposes five to ten refuges per hectare is adequate; the number used at the survey site was much more to give a better chance of recording reptiles if present. Froglife (1999) suggests that at least seven visits in suitable weather conditions are required, although CCW suggested that ten visits would be more appropriate.

Birds

Habitat Assessment

2.2.24 Birds observed during the Extended Phase I Habitat Survey were recorded and notes were made on the suitability of the survey site for nesting birds.

Detailed Surveys

2.2.25 The breeding bird survey used the British Trust for Ornithology's (BTO) Common Bird Census technique (Marchant 1983). The survey was started in April and was completed in

July 2007. The Common Bird Census (CBC) utilises territory mapping and is an established and generally accepted methodology (IEEM 2005). It requires repeated visits to a site during the bird breeding season. Five to ten visits is appropriate; open habitats would be at the bottom of this range, while woodland would be at the top (Sutherland 1996). Due to the relatively small size of the site each survey visit was completed within one day, and repetition on five occasions during the breeding period should be sufficient to provide reasonable data on distribution, relative abundance and records of species of conservation interest (Hill *et al.* 2005). An additional two evening visits to consider species such as owls and Woodcock (*Scolopax rusticola*) were undertaken. As bird territories are unlikely to align with the survey site boundary birds outside this area were recorded where appropriate.

2.2.26 An update to this survey was completed in 2010. Only two visits were completed at this time as it was relatively late in the season; 3rd and 30th June 2010.

2.3 Site Evaluation

2.3.1 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 with reference to 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.

2.3.2 Significant species were defined as follows:

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

2.3.3 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 ECOLOGICAL BACKGROUND DATA SEARCH

3.1 Approach

3.1.1 Ecological information was gathered in 2007 from archival sources to provide background information on the ecological status of the survey site and its surroundings. Locations of designated sites are provided in *Figure 3*.

3.1.2 Statutory organisations and other relevant bodies were contacted to request information within three search areas. These search areas and the data requirements were identified following a brief review of available information regarding the proposed development in order to delineate a potential zone of influence. The extent of each search area was subsequently defined using standard guidelines for Ecological Impact Assessment (EcIA) (*e.g.* Institute of Environmental Assessment 1995; Institute of Ecology and Environmental Management 2006).

3.1.3 The following information was requested within 1 km of the survey site:

- non-statutory designated sites for nature conservation (*e.g.* County Wildlife Sites);
- Ancient Woodland, or long-established semi-natural woodland;
- species protected by the *Wildlife and Countryside Act 1981* (as amended);
- species protected by European directives;
- species listed in the *Natural Environment and Rural Communities Act 2006*;
- red data book species;
- species and habitats listed in the Wrexham Biodiversity Action Plan (BAP); and
- other species listed as scarce or notable in literature issued by conservation organisations or learned societies.

3.1.4 The following information was requested within 2 km of the survey site:

- international and national statutory sites for nature conservation (*e.g.* RAMSAR, SPA, SAC, SSSI, LNR).

3.1.5 The following information was requested within 5 km of the survey site:

- All bat records, as suggested by Mitchell-Jones 2004.

3.1.6 Information was requested on other organisations and other relevant local wildlife groups to contact, *e.g.* bat, local mammal, herpetofauna and bird groups.

3.1.7 Widely available contextual information was also 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 Biodiversity Action Plan (UKBAP);
- 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 Map' http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/protected-sites-map.aspx.

3.1.8 Data included within previous ecological survey reports (Cass Associates 2004a; SLR 2007) was also utilised, where considered appropriate.

3.1.9 In 2007 the following organisations/ individuals were contacted: Countryside Council for Wales (Matthew Ellis, Regional Species and Biodiversity Officer), Wrexham County Borough Council (Emma Broad, Biodiversity Officer), North Wales Wildlife Trust (Rhian Hughes, Assistant Conservation Officer), North East Wales Wildlife, Clwyd Bat Group, Vice County 50 BSBI Plant Recorder (Jean Green; at that time), Clwyd Bird Recording Group, Wrexham Bird Watchers, County Invertebrate Recorder (Bryan Formstone) and Clwyd Badger Group. Cofnod (North Wales Environmental Information Service) was launched in April 2007 subsequent to the background data search completed in 2007 for the Phase I development. Cofnod provides a centralised database for environmental records and incorporates data from many of the organisations/ individuals contacted for the Phase I study.

3.1.10 Due to the time elapsed since the 2007 data search and changes to data provision in north Wales a limited data search has been completed to inform this EcIA. The information as described above was requested but from a 1 km search area only. Data was requested from Cofnod, Matthew Ellis and Zara Lomax (WCBC, Ecologist). *Table 1* lists the statutory organisations and other relevant bodies that were contacted and presents a brief description of the consultation process.

Table 1 – Summary of consultation.

Organisation	Contact date	Date reply received and summary
Countryside Council for Wales (Matthew Ellis, Regional Species and Biodiversity Officer)	27th June 2011.	**12th July 2011**. Email received with attached map. Map shows records for bats, Great Crested Newt and Badger within an area largely in excess of 1 km from the survey site. No statutory protected sites are shown.
Wrexham County Borough Council (Zara Lomax, Ecologist)	27th June 2011.	**1st August 2011**. Email received with attached map and information. Identifies non-statutory protected sites (one) within 1 km of the survey site.
Cofnod (North Wales Environmental Information Service)	24th June 2011.	**29th June 2011**. Comprehensive report and associated maps received indicating non-statutory Wildlife Sites and protected/notable species records within 1 km of the site. Species records include data provided by the following organisations: Clwyd Badger Group (sett records), Clwyd Bird Recording Group, North East Wales Amphibian and Reptile Network, NE Wales Bat Roosts Database, Countryside Council for Wales and the National Biodiversity Network, as well as records uploaded onto the Cofnod Online Recording System.

3.2 Findings

Statutory Protected Sites

3.2.1 There are no statutory protected sites within 2 km of the survey site. The nearest statutory protected site is Afon Dyfrdwy (River Dee) Site of Special Scientific Interest (SSSI)/ River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) Special Area of Conservation (SAC). It is approximately 2.45 km to the east (SSSI)/ 2.83 km to the south-east (SAC) of the survey site at its nearest point. Special Areas of Conservation (SACs) are of international (European) importance and are designated under 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.* Sites of Special Scientific Interest (SSSIs) are of national importance and are designated under *The Wildlife and Countryside Act 1981 (as amended)*, and are also affected by the *CRoW Act 2000.*

3.2.2 The River Dee and Bala Lake SAC[1] has been designated for the following reasons:

- *Annex 1* habitats that are a primary reason for selection:
  - Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.
- *Annex 2* species that are a primary reason for selection:
  - Atlantic Salmon (*Salmo salar*).
  - Floating Water-plantain (*Luronium natans*).
- *Annex 2* species that are present as a qualifying feature, but not a primary reason for selection:
  - Sea Lamprey (*Petromyzon marinus*).
  - Brook Lamprey (*Lampetra planeri*).
  - River Lamprey (*Lampetra fluviatilis*).
  - Bullhead (*Cottus gobio*).
  - Otter (*Lutra lutra*).

Non-Statutory Sites

3.2.3 There is one Wildlife Site split into three separate locations within the 1 km search area. The selection criteria were developed by WCBC in conjunction with North Wales Wildlife Trust and CCW. Surveying of all sites was carried out during 1997 and 1998. Wildlife Sites comprise '*...areas of substantive value including both the most important and the most distinctive species, habitats, geological and geomorphological features within a national, regional and local context*' (Emma Broad, *pers. comm.*). *Table 2* summarises the information provided. The summary description is adapted from information previously supplied by WCBC. *Figure 3* shows Wildlife Sites within 1 km of the site.

[1] Detail available from the JNCC website, http://www.jncc.gov.uk/protectedsites/sacselection/sac.asp?EUcode=UK0030252.

Table 2 – Wildlife Sites within 1 km.

Site name	Grid Reference	Approximate distance from survey site boundary	Summary Description
Wrexham Industrial Estate (W337)	Various.	Part of Bryn Lane section is located within survey site boundary.	Redwither Road (SJ 385 493), Bryn Lane (SJ389 499) and Ash Road South (SJ 378 500). The Wildlife Site is characterised by derelict land with a complex mosaic of scrub, grassland and tall herbs. Species-rich grassland occurs where there is rabbit grazing with Cowslip, Common Centaury and Common Bird's-foot trefoil. Other species of interest include Dyer's Greenweed and Grass Vetchling.

3.2.4 Cofnod have indicated that there is no known Ancient Woodland within the 1 km search area.

Species

3.2.5 Cofnod provided the following species records for the 1 km search area:

- **Category 1 Species**: species with International or UK legal protection, *Section 42* [NERC] Species and UK BAP Priority Species.
- **Category 2 Species**: Global Red List, British Red Data Book, Rare & Scarce, and Welsh Red and Amber Birds & Welsh Vascular Plant Red Data List (where these are not identified in Category 1).
- **Category 3 Species**: LBAP Species not identified under Categories 1 and 2.

3.2.6 Data on the following species groups was provided for the 1 km search area:

- mammals (Badger, Polecat);
- bats (Whiskered bat, *Pipistrellus* sp.);
- amphibians (Great Crested Newt, Smooth Newt, Common Frog and Common Toad);
- reptiles (Slow-worm, Adder);
- birds (Common Grasshopper Warbler, Kestrel, Spotted Flycatcher, Barn Owl, Barn Swallow, Common Buzzard, European Greenfinch, Great Tit, Common Chiffchaff, Hedge Accentor, Blackcap, Blue Tit as well as a large number of records for the SJ 34 and SJ 35 10km grid-squares);
- invertebrates (Grizzled Skipper, Dingy Skipper, Small Heath, various moths, true flies, bumblebees, beetles and odonata); and
- plants (Rough Hawk's-beard, Prickly Lettuce, Thread-leaved Water-crowfoot).

Two records were also supplied for outside the 1 km search area: Badger and a moth.

3.2.7 Cofnod provide two sets of species records – a 'Confidential' set which includes detailed grid references and which are not authorised for release into the public domain, and an additional 'Public Version' where the accuracy of some of the grid references has been reduced (*i.e.*

whereby six-figure grid references have been reduced to four-figure grid references). The Confidential data set has been issued to the client as part of this study, however 'Public Version' records are utilised in this document (the full report of which is provided as *Appendix 1*). Many of the records within the 1 km search area are provided with at least a six-figure grid reference in the 'Public Version'; this has enabled an approximate measurement of the distance from the site boundary to be undertaken. In these cases, distances are recorded approximately from the centre of the site. The site is located in the 1 km grid squares: SJ 3950 and SJ 3949.

3.2.8 Maps indicating the location of the records were provided by Cofnod, although these were not included in the 'Public Version'. In summary, there are records for the following within the 1 km search area:

- Mammals –
  - Three records of Badger (*Meles meles*) dated 2003 to 2007 from the SJ 3849 1 km grid square.
  - One record of Polecat (*Mustela putorius*) dated 2004 located approximately 900 m from the site.
- Bats –
  - One record of Whiskered Bat (*Myotis mystacinus*) dated 1999 from the SJ 3849 1 km grid square.
  - One record of *Pipistrellus* sp. dated 2003 from the SJ 3849 1 km grid square.
- Amphibians –
  - A large number of records of Great Crested Newt (*Triturus cristatus*) dated between 1992 and 2009. The closest record is from the site itself and is from the 2007 survey.
  - Four records of Smooth Newt (*Lissotriton vulgaris*) dated between 1992 and 1999. The closest record is located approximately 260 m from the site.
  - One record of Common Frog (*Rana temporaria*) dated 1992 located approximately 740 m from the site.
  - One record of Common Toad (*Bufo bufo*) dated 1992 located approximately 591 m from the site.
- Reptiles –
  - Two records each of Slow-worm (*Anguis fragilis*) and Adder (*Vipera berus*) all dated 1999 and from the SJ 3849 1 km grid square.
- Birds –
  - A number of records of a range of species. The closest record is for Common Grasshopper Warbler (*Locustella naevia*) dated 2011. This record is from the Phase I 'mitigation area'; approximately 223 m from the site.
- Invertebrates –
  - A number of records of a range of species. The closest records are for Broad-bodied Chaser (*Libellula depressa*) and Grizzled Skipper (*Pyrgus malvae*) both dated 2009. Both records are from the Phase I 'mitigation area'.

- Plants –
  - Records of three species dated between 1979 and 1998. The closest record is for *Lactuca serriola* (Prickly Lettuce) located approximately 447 m from the site.

3.2.9 CCW provided records for bats, Great Crested Newts and Badger within an area largely in excess of 1 km from the site. These records broadly correlate with those provided by Cofnod.

3.2.10 Records included within a survey report by SLR (SLR 2007) can be summarised as follows:

- Clwyd Bat Group confirmed that Pipistrelle, Whiskered and Brown Long-eared Bats were recorded on Wrexham Industrial Estate in 2006; and
- Clwyd Badger Group has noted Badger deaths on a road 'nearby' the survey site.

3.2.11 A review of species records on the NBN website provided no additional records.

4 RESULTS

4.1 Introduction

4.1.1 The Extended Phase 1 Habitat Survey map is provided as *Figure 2*. The *Target Notes* recorded during the Extended Phase 1 Habitat Survey and update walkover surveys (in 2009, 2010 and 2011) are presented in *Section 7*. The tables of data provided in *Section 9* detail species recorded during all detailed surveys and include incidental records. *Table 19* lists vascular plants, *Table 20* lists birds and *Table 21* lists all other species including mammals, amphibians and invertebrates.

4.2 Site Description

4.2.1 The survey site comprises approximately just under 4 hectares of land located to the west of Bryn Lane, in the northeast sector of Wrexham Industrial Estate, approximately 3 km east of Wrexham town centre. Wrexham Landmap identifies the industrial estate as character area 11: Wrexham lowland urban (W/LC/11). In general the area is fairly low-lying as it is located near the edge of the River Dee flood-plain. The Phase II site is characterised by areas of mature scrub and neutral grassland with scattered scrub. The survey site excludes the proposed Phase II access road as this would utilise the existing road provided for the Phase I facility, and the area proposed for solar panels which is characterised by amenity grassland.

4.2.2 The eastern boundary of the survey site is either formed by Bryn Lane or the premises of CPL Distribution. Grazed pasture fields are located to the immediate south, with associated residential buildings. On the opposite side of the ditch (which forms much of the northern/ western boundary of the site) is located a recently constructed Waste Recycling and Composting Facility (WRCF) – Phase I, as well as a Household Recycling Centre (HRC) (both operated by Waste Recycling Group). An area of neutral grassland is located immediately to the north of the survey site. To the north of the HRC a parcel of land has been developed in mitigation/ compensation for the construction of the WRCF; it comprises six ponds (five of which were constructed in 2007/08), neutral grassland, scrub and woodland. The landscape surrounding the survey site is otherwise generally characterised by a variety of light manufacturing and industrial premises that are typical of this sector of the industrial estate.

4.3 Habitats and Flora

Survey Site

4.3.1 The survey site is dominated by species-poor neutral rough grassland, with occasional associated stands of tall-ruderal vegetation. A stand of *Betula pendula* (Silver Birch) secondary woodland is located in the western corner of the site, associated with a much larger adjacent stand of mature scrub/ scattered trees on a spoil tip. Elsewhere scrub is mainly associated with fence lines, boundaries, and a ditch corridor. Habitat types recorded are as follows:

- A stand of *Betula pendula* (Silver Birch) dominated secondary semi-natural woodland;

- Mature *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) scrub;
- Scattered scrub, particularly adjacent to fence lines, boundaries and along a ditch;
- Planted mixed scrub/ young trees and occasional mature trees (with an associated area of amenity planting);
- Neutral grassland (mostly species-poor rough grassland);
- Several distinct stands of species-poor tall-ruderal vegetation;
- A ditch; and
- A small ephemeral waterbody.

Broad-leaved woodland and scrub

4.3.2 There is a stand of young, secondary, semi-natural broad-leaved woodland in the western corner of the survey site (*Target Note 44*). It extends outside the survey site adjacent to an electricity sub-station. The canopy is dominated by *Betula pendula* (Silver Birch) with occasional *Salix cinerea* (Grey Willow) and, rarely, *Quercus robur* (Pedunculate Oak). The shrub layer is sparse, comprising scattered *Crataegus monogyna* (Hawthorn), *Sambucus nigra* (Elder), *Rosa canina* agg. (Dog-rose) and associated scrambling *Lonicera pericylmenum* (Honeysuckle). The field layer is generally species-poor with the woodland floor often carpeted with *Hedera helix* (Ivy). The tall-ruderal *Urtica dioica* (Common Nettle) forms locally frequent stands. Woodland herbs are limited to occasional plants of *Arum maculatum* (Lords-and Ladies), frequent *Alliaria petiolata* (Garlic Mustard) and *Geranium robertianum* (Herb-Robert). The locally scarce plant *Hypericum hirsutum* (Hairy St. John's-wort) is also present. A range of other species often characteristic of more open habitats are scattered throughout.

4.3.3 Adjacent to this woodland lies a much larger area of mature *Crataegus monogyna* (Hawthorn) dominated scrub (*Target Note 42*). This scrub has established on a mound that has previously been utilised as a tip. The shrubs are often 4-5 m in height and may in places be better described as scrub-woodland, especially where young *Betula pendula* (Silver Birch) trees are frequent. *Rubus fruticosus* agg. (Bramble) is abundant, occasionally forming dense stands associated with *Urtica dioica* (Common Nettle), especially in more open areas. Other shrubs present include occasional *Salix cinerea* (Grey Willow) and *Salix caprea* (Goat Willow), with scattered shrubs of *Sambucus nigra* (Elder), *Prunus spinosa* (Blackthorn), young *Quercus robur* (Pedunculate Oak) trees and *Rosa canina* agg. (Dog-rose). The field layer is species-poor, being locally dominated by *Urtica dioica* (Common Nettle) and frequent *Galium aparine* (Cleavers). Woodland herbs are limited to occasional plants of *Arum maculatum* (Lords-and Ladies) and *Mercurialis perennis* (Dog's Mercury) and the fern *Dryopteris filix-mas* (Male-fern). A wide range of other species often characteristic of more open habitats are scattered throughout, especially in small, open grass-dominated areas. A recently cleared area/associated trackways within the mature scrub (*Target Note 42a*) are described below.

4.3.4 A band of scrub of variable width (*Target Note 38*) dominates the eastern side of the ditch described in *Target Note 13.* It is dominated by *Crataegus monogyna* (Hawthorn) with *Rubus fruticosus* agg. (Bramble) and *Rosa canina* agg. (Dog-rose). Where present, the field layer is species-poor and dominated by *Urtica dioica* (Common Nettle). Another distinct stand of scrub is located at *Target Note 46.* This resource is partly dominated by dense *Prunus spinosa* (Blackthorn) and partly by mosaics of low growing *Rubus fruticosus* agg. (Bramble), with young trees, tall-herbs and coarse-leaved grasses.

4.3.5 Elsewhere, scrub is largely associated with fence lines and boundaries. It is of variable species composition, sometimes being dominated by *Rubus fruticosus* agg. (Bramble) or dense *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) (*Target Note 37*). Scattered scrub is associated with much of the neutral grassland resource particularly that described in *Target Note 39*.

4.3.6 Several areas along the eastern boundary with Bryn Lane support planted scrub and young trees such as *Alnus glutinosa* (Alder), *Alnus incana* (Grey Alder), *Fraxinus excelsior* (Ash), *Quercus robur* (Pedunculate Oak) and *Salix caprea* (Goat Willow) with occasional larger *Populus* sp. (a Poplar) trees (*Target Notes 35, 36* and *40*).

Neutral grassland

4.3.7 The majority of the grassland resource in the survey site is species-poor neutral rough grassland, with a tussocky, rank structure (*Target Notes 36* and *39*). The coarse-leaved grasses *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Elytrigia repens* (Common Couch) are co-dominant with other grasses present including *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue), *Phalaris arundinacea* (Reed Canary-grass) and *Deschampsia cespitosa* (Tufted Hair-grass). *Juncus inflexus* (Hard Rush) is occasional. Tall-herbs and lower growing forbs are scattered throughout at low levels of abundance. These include *Anthriscus sylvestris* (Cow Parsley), *Heracleum sphondylium* (Hogweed), *Cardamine pratensis* (Cuckooflower), *Cirsium arvense* (Creeping Thistle), *Galium aparine* (Cleavers), *Epilobium hirsutum* (Great Willowherb), *Rumex acetosa* (Common Sorrel), *Potentilla reptans* (Creeping Cinquefoil), *Rumex obtusifolius* (Broad-leaved Dock), *Urtica dioica* (Common Nettle), *Vicia sativa* (Common Vetch) and *Vicia hirsuta* (Hairy Tare). The locally scarce plants *Genista tinctoria* (Dyer's Greenweed) and *Lathyrus nissolia* (Grass Vetchling) are present in very low levels of abundance. Young *Crataegus monogyna* (Hawthorn) bushes are locally scattered and there are occasional tall-herb stands comprising *Epilobium hirsutum* (Great Willowherb) and *Urtica dioica* (Common Nettle).

4.3.8 More species-rich neutral grassland is located in the northeast corner of the survey site (*Target Notes 33* and *34*). The sward generally has a variable structure and comprises a variety of grasses such as *Arrhenatherum elatius* (False Oat-grass), *Cynosurus cristatus* (Crested Dog's-tail), *Deschampsia cespitosa* (Tufted Hair-grass), *Dactylis glomerata* (Cock's-foot), *Holcus lanatus* (Yorkshire-fog), *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue) and *Phalaris arundinacea* (Reed Canary-grass). A range of herbs and forbs are scattered throughout such as *Centaurea nigra* (Common Knapweed), *Achillea millefolium* (Yarrow), *Geranium dissectum (*Cut-leaved Crane's-bill), *Trifolium repens* (White Clover), *Senecio jacobaea* (Common Ragwort), *Bellis perennis* (Daisy), *Leucanthemum vulgare* (Oxeye Daisy), *Cerastium fontanum* (Common Mouse-ear) and *Daucus carota* (Wild Carrot). The locally scarce plant *Lathyrus nissolia* (Grass Vetchling) is present. This grassland is generally located in a mosaic with stands of tall ruderals and small patches of scrub.

Tall-ruderal vegetation

4.3.9 Three large stands of tall-ruderal vegetation occur within the survey site (*Target Notes 33, 42* and *42a*). These stands are generally species-poor and dominated by *Urtica dioica* (Common Nettle) with other tall-ruderals such as *Epilobium hirsutum* (Great Willowherb) and

Heracleum sphondylium (Hogweed), the scrambler *Galium aparine* (Cleavers) and coarse-leaved grasses including *Arrhenatherum elatius* (False Oat-grass) and *Dactylis glomerata* (Cock's-foot). A distinct stand is described at *Target Note 42a*, this having developed further to clearance of mature scrub at this location. Here the vegetation is dominated by *Urtica dioica* (Common Nettle), with a wide variety of other tall-herbs, grasses and low growing forbs. Occasional plants of the locally scarce *Helminthotheca echioides* (Bristly Ox-tongue), and locally scarce *Papaver somniferum* (Opium Poppy) are also present. Elsewhere within the mature scrub described at *Target Note 42*, recently cleared trackways are now dominated by the tall-herbs *Urtica dioica* (Common Nettle) and *Chamerion angustifolium* (Rosebay Willowherb).

Aquatic habitat

4.3.10 A ditch (*Target Notes 13* and *18*) forms much of the northern/ western boundary of the survey site, flowing roughly southeast to northwest. The flow is imperceptible. The water is approximately 2 to 2.5 m wide and between 0.4 m and 1 m deep (although in places it was virtually dry in 2011). The channel from water level to bank top is approximately 1.5 to 2 m deep and 4 m wide between the bank-tops. The sides of the channel are steeply sloping (45-60°) and have a uniformly engineered profile. Marginal vegetation is mostly dominated by the grass *Agrostis stolonifera* (Creeping Bent) but includes locally frequent *Juncus inflexus* (Hard Rush), occasional *Carex otrubae* (False Fox-sedge), *Deschampsia cespitosa* (Tufted Hair-grass) and *Phalaris arundinacea* (Reed Canary-grass). Channel vegetation includes occasional stands of *Typha latifolia* (Bulrush), locally frequent *Callitriche stagnalis* (Common Water-starwort) (especially in deeper sections) and *Iris pseudacorus* (Yellow Iris), and lesser amounts of *Alisma plantago-aquatica* (Water-plantain) and *Ranunculus sceleratus* (Celery-leaved Buttercup). A filamentous alga is locally abundant throughout. The floating leaved plants *Potamogeton natans (*Broad-leaved Pondweed), *Lemna minor* (Common Duckweed) and *Lemna trisulca* (Ivy-leaved Duckweed) also occur in variable levels of abundance. The locally scarce plant *Carex pseudocyperus* (Cyperus Sedge) is also occasionally associated with the ditch margins.

4.3.11 At *Target Note 45*, a small, ephemeral waterbody is located amongst scrub. It measures approximately 3 m by 6 m and does not hold water throughout the year. The margins are dominated by *Epilobium hirsutum* (Great Willowherb) and *Filipendula ulmaria* (Meadowsweet) with lesser amounts of *Galium palustre* (Common Marsh-bedstraw). There is a large patch of *Glyceria fluitans* (Floating Sweet-grass) and *Agrostis stolonifera* (Creeping Bent) in the centre and *Lemna minor* (Common Duckweed) is also present. A second damp hollow adjacent to this waterbody is dominated by *Solanum dulcamara* (Bittersweet) and is drying out. Both were dry in 2011.

Immediately Adjacent Habitat

4.3.12 Land to the west of the ditch comprises the recently constructed WRCF (refer to *paragraph 4.2.2*). The immediate ditch boundary supports a line of scrub with occasional narrow margins of tall-herb vegetation and species-rich neutral grassland (*Target Note 47*). The remainder of this area has largely been built over, although limited areas of amenity grassland and shrub plantings are present. Between this site and the HRC to the north is located an attenuation lagoon (*Target Note 48*) and, further north, a small area of recently sown wildflower grassland.

4.3.13 To the south-west of the survey site, the scrub/ woodland resource that occupies the spoil tip continues outside the survey site (adjacent to an electricity sub-station) (*Target Notes 7, 8* and *44*). Narrow margins of species-rich neutral grassland are located on the edge of this habitat.

4.3.14 Small stands of dense scrub (*Target Note 8*) and semi-natural broad-leaved woodland (*Target Note 7*) are also located immediately adjacent to the site. These resources have not been assessed in detail.

4.4 Fauna

4.4.1 Birds and other animals recorded during the surveys are presented in *Tables 20* and *21* (*Section 9*) respectively.

Badger

4.4.2 Survey results for Badger are provided in a separate confidential Badger Survey Annex (Marches Ecology, 2011b).

Bats

Habitat Assessment

4.4.3 Much of the western/ northern boundary of the survey site is formed by a wide ditch with dense scrub along some sections of the banks, particularly the eastern/ southern banks (*Target Notes 13, 18* and *38*). This linear feature may be of value for commuting by species that utilise such features. The rank grassland that characterises the survey site (*Target Notes 33, 34, 36* and *39*) is largely species-poor and consequently may be of limited value as a foraging resource due to the invertebrate fauna it supports. However the patches of scrub and edges of the dense scrub and woodland (*Target Notes 37, 42* and *44*) may provide valuable foraging habitat and linear features.

4.4.4 The survey site is largely surrounded by light manufacturing and industrial premises. The external light sources on many of the premises may reduce the use of the site by some species of bat. Pockets of habitat (that may be utilised by bats) do occur in the immediate locality, for example grazed pasture fields (with associated trees and hedgerows) to the south of the survey site, and an area supporting ponds, neutral grassland and woodland to the north of the HRC. Open farmed countryside is located to the east. In the general locality, the survey site represents an extant area of habitat that was previously larger in extent.

Inspection of Trees

4.4.5 There is a small patch of woodland (*Target Note 44*) immediately to the north of the spoil tip. The trees are mostly *Betula pendula* (Silver Birch) and *Quercus robur* (Pedunculate Oak) and have an approximate dbh of 0.2 m to 0.3 m. There is also a semi-mature *Quercus robur* (Pedunculate Oak) tree with an approximate dbh of 0.4 m. Most of the trees in this area have no potential value for roosting bats, but a small number are of low value, where for example they support dense *Hedera helix* (Ivy) and or *Lonicera periclymenum* (Honeysuckle) growing up the trunk.

4.4.6 Other trees within the site are described at *Target Notes 35, 36* and *40*. None of these trees are considered to provide any features of potential value for roosting bats.

Detailed Survey

4.4.7 No bats were recorded emerging from potential roost sites within the survey site during the three visits conducted on May 2nd, May 23rd and July 4th 2007. Low numbers of Common Pipistrelle (*Pipistrellus pipistrellus*) were recorded commuting across the survey site and also foraging along the eastern boundary. Soprano Pipistrelle (*Pipistrellus pygmaeus*) was also recorded foraging/commuting along both the ditch corridor and the tree-line on the eastern boundary. No other detailed bat surveys are known to have been undertaken on the survey site.

Water Vole

Habitat Assessment

4.4.8 Water Voles are known to prefer watercourses which support wide zones of marginal vegetation and which are slow flowing and relatively deep; over 1 m in depth (Strachan and Moorhouse, 2006). *Table 3* below presents a summary of the potential habitat provided by the ditch (*Target Notes 13* and *18*) and small ephemeral water body at *Target Note 45* and assesses their potential suitability for Water Vole.

Table 3 – Potential Water Vole Habitat.

Target Note	Description	Qualitative Assessment	Potential Suitability
13 & 18	Ditch. Forms much of the western and northern boundary of the survey site; described in *paragraph 4.3.10*. Ditch banks are mostly covered by dense scrub and Birch trees Water with slow flow to 1 m deep. Earth banks provide potential burrowing opportunities. Marginal vegetation is limited along some stretches probably due to shading by adjacent scrub.	Poor – sub-optimal	Yes but unlikely.
45	Small, ephemeral waterbody. Dry throughout much of the year.	Poor – sub-optimal	No.

Detailed Survey

4.4.9 No signs of Water Vole activity were recorded during the detailed surveys undertaken in 2007 and 2010, and no evidence was noted during the previous detailed survey (SLR 2007). Brown Rats (*Rattus norvegicus*) are also present which may limit the potential for Water Vole to colonise in the future.

Otter

Habitat Assessment

4.4.10 Otters could potentially include the ditch (*Target Notes 13* and *18*) 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.

Detailed Survey

4.4.11 No evidence of Otter activity was recorded along the ditch during the detailed surveys undertaken in 2007 and 2010.

Great Crested Newt

Habitat Assessment

4.4.12 The terrestrial habitat within the survey site (woodland, scrub, grassland and tall-herbs) can be considered as high quality habitat for Great Crested Newts [foraging/ hibernating and dispersal]. Terrestrial habitat can vary but usually dense ground vegetation is preferred where prey species are readily available along with the presence of voids in the substrate to allow refuge (English Nature 2001). Areas of woodland/ dense scrub are often particularly favoured.

4.4.13 Great Crested Newts have been recorded within the survey site; as part of a separate commission to construct an artificial Badger sett[2] within the area described at *Target Note 36* (for which a Welsh Assembly Government Great Crested Newt 'development' licence was obtained), Marches Ecology translocated three juvenile Great Crested Newts (June 2009). A single female Great Crested Newt was also recorded beneath an artificial refuge within the grassland area at *Target Note 41a* during the 2011 walkover survey.

4.4.14 Aquatic habitat within the survey site is provided by the ditch (*Target Notes 13* and *18*) that forms much of the western/ northern boundary of the survey site and a small, ephemeral waterbody at *Target Note 45*. The ditch is further described above in *paragraph 4.3.10*. It provides potentially suitable Great Crested Newt breeding habitat as the flow is imperceptible and there are a variety of potential egg-laying substrates. The small, ephemeral waterbody provides sub-optimal habitat for Great Crested Newts. Although it may be used for foraging, and possibly egg-laying early in the season, reproduction is unlikely to be successful if the waterbody dries up.

4.4.15 An initial review of the OS map 1:25, 000 scale and relevant internet-based mapping indicates that there may be an additional seventeen waterbodies (not including ditches or streams) within approximately 500 m of the survey site boundary; these are indicated in *Figure 4* (this figure also indicates known Great Crested Newt records). Eleven of these are located within 250 m, as follows:

[2] The project to construct the artificial sett was put on hold; no sett has been built to date.

- Six within land to the north of the HRC (itself located to the north of the survey site). Five of these ponds were constructed in 2007/08 and are known to have supported breeding Great Crested Newts since 2009;
- Three to the east of Bryn Lane, all of which are known to support/ have supported Great Crested Newts (CCW records);
- One to the immediate south of CPL Distribution (to the south of the survey site) – this is not known to support Great Crested Newts; and
- One to the west of the survey site, on the opposite side of Bridge Road (North) – this is known as the Isringhausen pond and was subject to detailed survey in 2007 (see below) – Great Crested Newts were recorded.

These ponds, and the results of the detailed surveys where undertaken, are discussed in more detail below.

Detailed Survey

4.4.16 Detailed survey for Great Crested Newts was undertaken in April/ May 2007 at five waterbodies; the ditch on the western/ northern boundary of the survey site (this was surveyed in two separate locations, at *Target Note 13* and approximately 50 m north of the survey site boundary), a pond located within the land to the north of the HRC (number 1 on *Figure 4*; the other five have been constructed since this survey was undertaken), the Isringhausen pond and two located between Redwither Tower and Bridge Road (North). The ditch was also surveyed in 2010. *Figure 4* shows the location of the surveyed waterbodies. *Table 4* below provides details of the weather conditions recorded during the 2007 Great Crested Newt survey visits and *Tables 5 to 9* summarise the results of the Great Crested Newt survey.

4.4.17 With regards the small, ephemeral waterbody that is located within the survey site at *Target Note 45*, no newt eggs were found during the early part of the survey season in 2007 and the waterbody had dried up by May.

Table 4 – Weather Conditions.

Date	Temperature at dusk	Wind (Beaufort scale)	General weather conditions
11.04.2007	7 °C	0-1	Dry and clear.
19.04.2007	8.3 °C	0-1	Dry and clear.
26.04.2007	10.2 °C	0-1	Dry and clear.
03.05.2007	9.8 °C	0-1	Dry and clear.
08.05.2007	10.5 °C	1-2	Dry and clear.
18.05.2007	10.9 °C	1-2	Dry, cloudy.
22.05.2007	11.8 °C	0-1	Dry and clear.

Table 5 – 2007 Survey Results for the Ditch at Target Note 13.

Visit	Date	Egg search	Torch	Bottle trapping (20-36)
1	11.04.2007	-	1 ♂ Lv, 12 ♀ Lv, 1 Bb, Rt tadpoles	(20 traps) 1 ♂ Tc, 10 ♂ Lv, 13 ♀ Lv
2	19.04.2007	-	14 ♂Lv, 34 ♀ Lv	(36) 13 ♂ Lv, 16 ♀Lv, 1 Bb
3	26.04.2007	+ve Lv	11 ♂ Lv, 20 ♀ Lv, 1 Bb	(36) 31 ♂ Lv, 10 ♀ Lv
4	03.05.2007	+ve Tc +ve Lv	1 ♂ Tc, 2 ♀ Tc. 36 ♂ Lv, 43 ♀ Lv.	(31) 29 ♂ Lv, 9 ♀ Lv
5	18.05.2007	+ve Tc	1 ♂ Tc. 5 ♂ Lv, 6 ♀ Lv.	(30) 5 ♂ Lv, 4 ♀ Lv.
6	22.05.2007	-	1 ♂ Tc. 7 ♂ Lv, 4 ♀ Lv	8 ♂ Lv, 7 ♀ Lv.
Maximum count: 3 Great Crested Newt, 79 Smooth Newt.				

Table 6 – 2007 Survey Results for the Ditch to North of Survey Site.

Visit	Date	Egg search	Torch	Bottle trapping (0)
1	11.04.2007	-	Nil	n/a
2	19.04.2007	-	2 ♂ Tc, 3 ♂ Lv, 7 ♀ Lv	n/a
3	26.04.2007	-	7 ♂ Tc, 2 ♀ Tc, 8 ♂ Lv, 14 ♀ Lv	n/a
4	03.05.2007	+ve Tc	8 ♂ Tc, 3 ♀ Tc, 12 ♂ Lv, 12 ♀ Lv, 1 Bb, 1 Rt	n/a
5	18.05.2007	-	3 ♂ Tc. 1 ♂ Lv, 2 ♀ Lv.	n/a
6	22.05.2007	-	1 ♂ Tc, 1 ♀ Tc. 7 ♂ Lv, 4 ♀ Lv.	n/a
Maximum count: 11 Great Crested Newt, 24 Smooth Newt.				

Table 7 – 2007 Survey Results for the Pond to North of HRC.

Visit	Date	Egg search	Torch	Bottle trapping (30)
1	11.04.2007	+ve Lv	1 ♀ Tc (terrestrial), 1 ♀ Lv, Bb	Nil
2	19.04.2007	-	Nil	Nil
3	26.04.2007	-	1 unidentified newt	Nil
4	03.05.2007	-	Nil	Nil
5	18.05.2007	-	-	Nil
6	22.05.2007	-	-	Nil
Maximum count: 1 Great Crested Newt (terrestrial), 1 Smooth Newt.				

Table 8 – 2007 Survey Results for the Isringhausen Pond (SJ 385 500).

Visit	Date	Egg search	Torch	Bottle trapping (15)
1	26.04.2007	+ve Tc, +ve Lv	3 ♀Tc, 9 ♂ Lv, 9 ♀ Lv, 1 unidentified newt	3 ♀Tc, 1 juvenile ♀ Tc, 32 ♂ Lv, 17 ♀ Lv
2	01.05.2007	-	8 ♂ Lv, 9 ♀ Lv	2 ♂ Tc, 1 juvenile ♀ Tc, 28 ♂ Lv, 19 ♀ Lv
3	03.05.2007	-	1 ♂ Tc, 10 ♂ Lv, 6 ♀Lv	2 ♂ Tc, 1 ♀ Tc, 18 ♂Lv, 21 f♀ Lv
4	08.05.2007	-	10 ♂ Lv, 9 ♀Lv, 1 Rt	12 ♂ Lv, 11 ♀ Lv
5	18.05.2007	-	1 ♂ Tc, 5 ♂ Lv, 9 ♀ Lv, 1 Rt.	2 ♂ Tc, 2 ♀ Tc. 11 ♂ Lv, 9 ♀ Lv.
6	22.05.2007	-	6 ♂ Lv, 5 ♀Lv, 2 Lv larvae	2 ♂ Tc, 2 ♀ Tc, 9 ♂ Lv, 12 ♀ Lv, 1 Lv larva
Maximum count: 4 Great Crested Newt, 50 Smooth Newt.				

Table 9 – 2007 Survey Results for Two Adjacent Ponds at Redwither Tower (SJ 385 502 and 385 501).

Visit	Date	Egg search	Torch	Bottle trapping (0)
1	26.04.2007	-	Nil	n/a
2	01.05.2007	-	Nil	n/a

Key:
Tc – Great Crested Newt (*Triturus cristatus*)
Lv – Smooth Newt (*Lissotriton vulgaris*)
Rt – Common Frog (*Rana temporaria*)
Bb – Common Toad (*Bufo bufo*)

4.4.18 *Tables 10, 11* and *12* below provide the weather and results for the 2010 survey of the ditch.

Table 10 – Weather Conditions.

Date	Temperature at dusk	Wind (Beaufort scale)	General weather conditions
01.06.2010	11.5 °C	0	Dry, partially cloudy.
08.06.2010	15.5 °C	0-1	Dry and cloudy.
10.06.2010	14 °C	1-2	Dry and cloudy.

Table 11 – Survey Results for the Ditch at Target Note 13.

Visit	Date	Egg search	Torch	Bottle trapping (25-27)
1	01.06.2010	+ve Lv	3 ♂ Lv, 2 ♀ Lv	(25 traps) 1 ♂ Tc, 4 ♂ Lv, 1 ♀ Lv
2	08.06.2010	-	Nil	(27) 2 ♂ Lv
3	10.06.2010	-	Nil	(27) 1 ♂ Tc, 1 ♂ Lv
Maximum count: 1 Great Crested Newt, 5 Smooth Newt.				

Table 12 – Survey Results for the Ditch to North of Survey Site.

Visit	Date	Egg search	Torch	Bottle trapping (0)
1	01.06.2010	-	Nil	n/a
2	08.06.2010	-	Nil	n/a
3	10.06.2010	-	Nil	n/a

4.4.19 During the population estimate survey in 2007 a maximum of fourteen Great Crested Newts were recorded from the ditch (eleven within the ditch to the north of the HRC, refer to *Figure 4*) and egg-laying had taken place in the ditch both to the north of the HRC and on the boundary of the survey site. A maximum of one Great Crested Newt was recorded from the ditch in 2010. There are many possible reasons why a lower number was recorded but perhaps the most likely is that the survey visits were completed later in the year when dense vegetation could have reduced detectability. A maximum of four Great Crested Newts (including eggs) were recorded from the Isringhausen pond.

4.4.20 No Great Crested Newts were recorded from the two ponds adjacent to Redwither Tower. No Great Crested Newts were recorded from the pond to the north of the HRC and no eggs were located. However, a single female was recorded in terrestrial habitat just to the south of this pond. It is not known why this pond was not used by Great Crested Newts. However there may be a number of factors that make it less attractive including a thick mat of *Azolla filiculoides* (Water-fern) that covered most of the water surface before the end of April

(2007). It is also possible that numbers of amphibians migrating across the HRC access road were, at that time, becoming trapped in the gulley-pots.

4.4.21 It should be noted that the results of the survey visit undertaken on May 3rd 2007 may have been affected by a burst water main on Bridge Road (North) on April 24th 2007. The burst pipe filled the ditch with fast-flowing muddy water to the top of the banks. Although some amphibians may have been washed away by the force of the flow it also cleared the ditch of Duckweed improving visibility.

Phase I Mitigation Area Survey Results

4.4.22 Monitoring of the six ponds within the mitigation area is undertaken by North Wales Wildlife Trust on behalf of Waste Recycling Group (WRG). WRG have provided these results and confirmed permission to include the data within this EcIA. Maximum counts are provided for all six ponds combined only. The maximum count for Great Crested Newts in 2009 was 14 and in 2010 was 30. The corresponding counts for Smooth Newt were 13 and 108 (Berry 2010 & 2011).

Summary

4.4.23 Great Crested Newts are known to have bred (2007 and 2010) within the ditch on the (northern/ western) boundary of the survey site. Of the additional seventeen waterbodies located within 500 m, thirteen are known to support/ have supported Great Crested Newts. Apart from the ditch, the closest known waterbody to the survey site in which Great Crested Newts are known from is located approximately 150 m to the east of Bryn Lane. Also of note is the connecting terrestrial habitat that is present between the six ponds that are located within land to the north of the HRC (refer to *paragraph 4.4.15* above) and the survey site; Great Crested Newts are known to have bred in five of these ponds since 2009 with a maximum count of 30 recorded in 2010.

Other Amphibians

4.4.24 It is known that the survey site supports large populations of Common Frog (*Rana temporaria*) and Common Toad (*Bufo bufo*). Smooth Newts (*Lissotriton vulgaris*) are also known to be present in abundance; a maximum of 79 was recorded (in 2007) from the ditch on the western/ northern boundary of the survey site. This number indicates a medium[3]/ large[4] population. All three species were recorded during a Great Crested Newt translocation programme at *Target Note 36* in 2009 (refer to *paragraph 4.4.13*).

Reptiles

Habitat Assessment

4.4.25 The dense scrub, woodland and tussocky grassland within the survey site may be suitable for a number of reptile species. The tussocky grassland may be considered to provide high quality habitat and the ditch located on the western/ northern boundary supports large numbers of amphibians. Such features are often attractive to hunting Grass Snakes (*Natrix natrix*).

[3] A population can be classed as 'medium' where a maximum count of between 11 and 100 is recorded (English Nature 2001).
[4] A population can be classed as 'large' where a maximum count of over 100 is recorded (English Nature 2001).

Detailed Survey

4.4.26 No reptiles were recorded during the presence/absence survey in 2007. This indicates that a significant population does not inhabit the survey area at the present time (2007). However species, in particular the Grass Snake, that have a large home range may traverse the site, and may as mentioned above hunt along suitable habitat features. *Table 13* below provides details of the weather conditions recorded during the 2007 reptile survey visits.

Table 13 – Weather Conditions.

Visit	Date	Time of Visit	Temperature Range	Wind (Beaufort scale)	General weather conditions
1	09.04.2007	AM	12.5 – 14.0 °C	0-1	Dry, 80% thin cloud.
2	27.04.2007	AM	15.0 – 18.0 °C	0-1	Dry, 5% thin cloud.
3	29.04.2007	PM	20.0 – 21.0 °C	1-2	Dry, 5% thin cloud.
4	02.05.2007	AM	20 °C	1-2	Dry and clear.
5	04.05.2007	AM	13.5 – 15.5 °C	1-2	Dry, cloudy.
6	09.05.2007	AM	19 °C	1-2(3)	Dry, 50-75% cloud.
7	19.05.07	AM	19 °C	1-2(3)	Occ. light drizzle, intermittent direct sun, 50% cloud.
8	20.05.07	PM	16.5 °C	2(3)	Variable, intermittent direct sun, 30% cloud.
9	23.05.07	AM	19.3 °C	1-2	Variable, occ. direct sun 80-90% cloud.
10	25.05.07	AM	16 °C	2-3	Variable cloud cover 75-90%, occ. direct sun.

Birds

Habitat Assessment

4.4.27 The survey site provides nesting opportunities for a number of birds, largely associated with patches of scrub (*Target Notes 37, 38* and *42*). Some of the areas of dense tussocky grassland may also provide limited opportunities for ground-nesting species. Adjacent habitat outside the survey site includes similar nesting opportunities for birds, as well as the many buildings.

Detailed Survey

4.4.28 42 species of bird have been seen either within the survey site or flying over it during all surveys (*Table 20, Section 9*). Starling (*Sturnus vulgaris*) and Grasshopper Warbler (*Locustella naevia*) are UK BAP priority species, *NERC Act* species of principal importance and are included on the Birds of Conservation Concern Red List in the UK (Eaton *et al.* 2009) and Wales (RSPB 2009). Song Thrush (*Turdus philomelos*) has a similar status but is included on the Wales Amber List. Song Thrush bred within the survey site in 2007 and 2010. The habitat within the survey site could potentially be of value for breeding Grasshopper Warbler but it was not recorded during the detailed survey in 2007 and has only been recorded once during all visits.

4.4.29 Eleven species; Mallard (*Anas platyrhynchos*), Swift (*Apus apus*), Reed Bunting (*Emberiza schoeniclus*), Swallow (*Hirundo rustica*), House Martin (*Delichon urbica*), Meadow Pipit (*Anthus pratensis*), Dunnock (*Prunella modularis*), Woodcock (*Scolopax rusticola*), Garden Warbler (*Sylvia borin*), Whitethroat (*Sylvia communis*) and Barn Owl (*Tyto alba*) are all included on the UK and or Wales Amber Lists. The Willow Warbler (*Phylloscopus trochilus*) and Bullfinch (*Pyrrhula pyrrhula*) are included on the UK Amber List while they are on the Wales Red List. Reed Bunting, Bullfinch, Dunnock, Willow Warbler, and Whitethroat all bred within the survey site in 2007 and 2010. Reed Bunting, Bullfinch and Dunnock are also UK BAP priority species and *NERC Act* species of principal importance. Barn Owl, Bullfinch, Grasshopper Warbler, Starling, Song Thrush and Woodcock are also listed in WCB (2003) as species of conservation concern within the provisional list of Locally Important/ Endangered Species.

4.4.30 Barn Owl (*Tyto alba*) and Peregrine (*Falco peregrinus*) are listed on *Schedule 1* of the *Wildlife and Countryside Act 1981* (as amended). A single Barn Owl was observed hunting along the ditch to the south of the HRC site during the evening of May 23rd 2007 having entered the site from the east. The habitat within the survey site may be of value to hunting Barn Owls, however they are considered unlikely to breed within the survey site. In addition, the feeding remains, likely to be from a Peregrine (*Falco peregrinus*) kill, were recorded during the Extended Phase 1 Habitat Survey in the survey site and a bird was seen flying over in 2009. A single bird has been known to frequent Redwither Tower to the west of the survey site outside the breeding season.

4.4.31 Although no specific survey has been conducted the site may be of value to several wintering birds. During initial site visits in February and March 2007 Woodcock (*Scolopax rusticola*) were recorded in dense scrub or woodland cover; they may feed where exposed moist mud is located. Fruiting shrubs such as Hawthorn, Dog-rose, Elder and Bramble are likely to provide a food source for various birds, especially thrushes. Cass Associates (2004a) recorded thirty Linnet (*Carduelis cannabina*) in late-September of that year. The scrub may also be used by roosting birds.

4.4.32 The survey site supports a number of fairly widespread breeding passerines. These breeding birds are more-or-less restricted to areas of *Crataegus monogyna* (Hawthorn) scrub and the *Betula pendula* (Silver Birch)-dominated secondary woodland. *Table 14* below summarises the results of the 2007 and 2010 breeding bird surveys providing an estimate of breeding pairs. It should be noted that the division of breeding pairs is entirely arbitrary as many of the territories mapped are likely to overlap the survey site boundary. The results for 2010 must be considered indicative as only two visits were completed; no firm conclusions can be drawn.

4.4.33 21 species were recorded as breeding within the survey site in 2007 (excluding corvids and pigeons). Of the species of conservation interest noted above, the Reed Bunting (1 pair), Willow Warbler (3 or 4 pairs), Dunnock (2 or 3 pairs), Bullfinch (2 pairs), Whitethroat (4 or 5 pairs), and Song Thrush (2 or 3 pairs) bred within the survey site. It is likely that the distribution of breeding birds is strongly linked to the complexity of habitat structure, *e.g.* there are more birds found in the stands of mature, dense scrub and secondary woodland.

4.4.34 The 2010 survey results are broadly similar to those obtained in 2007. Two species, Goldcrest and Great Spotted Woodpecker, were recorded as possible breeders in 2010 but

not in 2007. It should be noted that both could have nested outside the site boundary. Four species recorded in 2007, Long-tailed Tit, Buzzard, Collared Dove and Garden Warbler, were not observed in 2010. As previously noted little can be concluded from these results.

Table 14 – Breeding Birds in 2007, 2010 and their Conservation Status.

Species	**Conservation Status**	**Estimated Number of Breeding Pairs**	
		2007	**2010**
Aegithalos caudatus (Long-tailed Tit)	Wales Amber[5]	Possibly 1 pair	-
Buteo buteo (Buzzard)		Possibly 1 pair	-
Carduelis chloris (Greenfinch)		2+ pairs	3 to 5 pairs
Carduelis carduelis (Goldfinch)		1 pair	1 pair
Columba palumbus (Woodpigeon)		Not recorded.	Not recorded.
Cyanistes caeruleus (Blue Tit)		2 or 3 pairs	2 or 3 pairs
Dendrocopos major (Great Spotted Woodpecker)		-	Possibly 1 pair
Emberiza schoeniclus (Reed Bunting)	S42[6], UKBAP[7], WBAP[8], UK Amber[9], Wales Amber	1 pair	1 pair
Erithacus rubecula (Robin)		3 or 4 pairs	2 to 4 pairs
Fringilla coelebs (Chaffinch)		1 or 2 pairs	1 or 2 pairs
Parus major (Great Tit)		1+ pairs	1 or 2 pairs
Phylloscopus collybita (Chiffchaff)		3 or 4 pairs	3 to 5 pairs
Phylloscopus trochilus (Willow Warbler)	UK Amber, Wales Red	3 or 4 pairs	2 pairs
Pica pica (Magpie)		Not recorded.	Not recorded.
Prunella modularis (Dunnock)	S42, UKBAP, UK Amber	2 or 3 pairs	2 or 3 pairs
Pyrrhula pyrrhula (Bullfinch)	S42, UKBAP, WBAP, UK Amber, Wales Red	2 pairs	1 or 2 pairs
Regulus regulus (Goldcrest)	UK Amber, Wales Red	-	Possibly 1 pair
Streptopelia decaocto (Collared Dove)		Possibly 1 pair	-
Sylvia atricapilla (Blackcap)		3 or 4 pairs	3 or 4 pairs
Sylvia borin (Garden Warbler)	Wales Amber	1 pair	-
Sylvia communis (Whitethroat)	UK Amber, Wales Amber	4 or 5 pairs	3 or 4 pairs

[5] Birds of Conservation Concern Wales Amber List (RSPB 2009).
[6] *Natural Environment and Rural Communities Act 2006; Section 42* list of species of principal importance for the conservation of biological diversity in Wales.
[7] UK Biodiversity Action plan priority species.
[8] Wrexham Biodiversity Action Plan: Provisional list of locally important/ endangered species (WCB 2003).
[9] Birds of Conservation Concern UK Amber List (Eaton *et al.* 2009).

Species	Conservation Status	Estimated Number of Breeding Pairs	
		2007	2010
Sylvia curruca (Lesser Whitethroat)	WBAP	1 pair	1 pair
Troglodytes troglodytes (Wren)		5 or 6 pairs	4 or 5 pairs
Turdus merula (Blackbird)		3 or 4 pairs	2 or 3 pairs
Turdus philomelos (Song Thrush)	S42, UKBAP, WBAP Priority, UK Red, Wales Amber	2 or 3 pairs	2 or 3 pairs

Other Species

4.4.35 A single female Club-tailed Dragonfly (*Gomphus vulgatissimus*) was recorded along the edge of the scrub on the mound on May 20th 2007. The Club-tailed Dragonfly is a Nationally Scarce[10] species. The stretch of the River Dee between Shocklach and Aldford is known to be extremely important for this species. This stretch of the River Dee is just over 3 km to the east of the site at its nearest point. The Club-tailed Dragonfly breeds in slow-flowing stretches of rivers where silt accumulates and very occasionally in standing waters nearby (Smallshire & Swash 2004). It is unlikely that this record is of anything more than a dispersing individual, immatures in particular are known to disperse up to 10 km.

4.4.36 The European Eel (*Anguilla anguilla*) was recorded in the ditch at *Target Note 13* during Great Crested Newt surveys although the size of the population is unknown.

4.4.37 No Grizzled (*Pyrgus malvae*) or Dingy Skippers (*Erynnis tages*) were recorded during any of the survey visits since 2007. The habitat within the survey site is not currently considered to be suitable for these butterflies.

[10] A Nationally Scarce invertebrate occurs in less than 100 10-km grid squares in the UK.

5 EVALUATION

5.1 Introduction

5.1.1 In evaluating the ecological resources within the survey site reference has been made to a number of texts. Three key texts are:

- The *Guidelines for the Selection of Biological SSSIs* (Nature Conservancy Council 1989). This text was used to determine whether each resource either separately or as part of a functioning ecosystem may be of national or greater importance as recommended by IEEM (2006).
- *UK Biodiversity Action Plan; Priority Habitat Descriptions* (BRIG 2008).
- *Wildlife Sites Guidance Wales: A Guide to Develop Local Wildlife Systems in Wales* (Wales Biodiversity Partnership [WBP] 2008). In the absence of published local guidance for selection and grading of locally valuable sites (County Wildlife Sites) this text was used to identify resources of local, district, county and where possible regional value.

5.1.2 The value categories assigned to each of the ecological resources are described in *Table 16, Section 6.1.*

5.2 Habitats and Flora

Introduction

5.2.1 There are no statutory protected sites within or directly adjacent to the survey site. Part of the Bryn Lane section of the Wrexham Industrial Estate Wildlife Site is located within the boundary of the survey site. Broadly this corresponds with *Target Notes 33, 34, 35, 36, 37, 40* and part of *38* and *39*. By definition this area may be considered to be of county value.

5.2.2 As indicated previously (*Section 2.3*) Biodiversity Action Plans are more important for guiding policy than for evaluating resources (*e.g.* IEEM 2006). However BRIG (2008) provides useful definitions and in some cases qualifying criteria with which to evaluate habitats. All of the UK BAP priority habitat types applicable to the survey site are also listed as habitats of principal importance for the conservation of biological biodiversity in Wales (under *Section 42* of the *Natural Environment and Rural Communities Act 2006*). This provides a more robust legislative basis for evaluating the importance of these habitats.

5.2.3 *Section 42* and UK BAP priority habitats present within the survey site are restricted to lowland mixed deciduous woodland, and (potentially) open mosaic habitats on previously developed land, and ponds. The applicability of the habitats within the survey site to the habitats of principal importance/ UK BAP priorities is discussed in more detail below where relevant. The Wrexham BAP (Wrexham County Borough 2003) includes Habitat Action Plans (HAP) for woodland, derelict and industrial land, and river, stream and canal.

5.2.4 It is thought that much of the habitat resource within the site has evolved on previously developed land; the scrub at *Target Note 42/ 42a* has colonised a former spoil tip and much of the grassland resource to the east of this (principally *Target Notes 33, 34* and *39*) is also

likely to have been developed in the past (the Wrexham Industrial Estate is largely located on the site of an old ordnance factory). However, the UK BAP priority habitat type of open mosaic habitats on previously developed land is described by BRIG (2008) as '*mosaics of bare ground with, typically, very early pioneer communities on skeletal substrates, more established open grasslands, usually dominated by fine-leaved grasses with many herbs, areas of bare ground, scrub and patches of other habitats such as heathland, swamp, ephemeral pools and inundation grasslands*'. Whilst much of the habitat resource on the site has undeniably established on 'previously developed land', and comprises scrub and grassland, overall it is not considered to fit with the ethos of the priority habitat type description. Accordingly, habitat types present have been assessed individually below.

Woodland and scrub

5.2.5 A small stand of young, secondary, semi-natural woodland is located at *Target Note 44*; it is dominated by *Betula pendula* (Silver Birch); it is species-poor, although the locally scarce plant *Hypericum hirsutum* (Hairy St. John's-wort) is present. This resource extends to approximately 0.13 hectares (1278 m^2). The majority of woodlands in Clwyd are much larger than this; 98.2% are over 2 hectares although this includes plantations (Forestry Commission 2002). Small woodlands where Birch is the principal species are frequent and widespread (Forestry Commission, *op. cit.*). Woodland has a specific Habitat Action Plan (HAP) within the Wrexham BAP.

5.2.6 Although it is secondary in nature, species-poor and has been subject to historic disturbance, arguably this stand of woodland could be considered to be relevant to the UK BAP priority habitat type of lowland mixed deciduous woodland outlined in BRIG (2008). It also fulfils one of the criteria outlined in WBP (2008) for selection (of woodland sites) as a County Wildlife Site; that is '*all undesignated semi-natural woodland with a mixed deciduous woodland component*'. Furthermore, when considered as a Wrexham BAP habitat it could be considered as of district importance. However, when its very small size, its limited structural diversity and its generally species-poor status are taken into account, it is considered to be of local value at most.

5.2.7 A large stand of mature scrub dominates the former spoil tip at *Target Notes 42* and *42a*. This resource extends to approximately 0.54 hectares (5421.6 m^2). In places this resource could better be described as scrub-woodland; overall it is species-poor. Scrub communities do not feature as a specific UK BAP priority habitat type, however WBP (2008) considers that this '*ignores the ground flora and wider faunal interest, that scrub stands can have*'. WBP (2008) further suggests that '*structurally-diverse and species-rich mixed scrub sites*' should be considered for selection [as County Wildlife Sites]. 'Species-rich' in this context is defined as 'normally' at least six native woody species and 'structurally-diverse' as including a '*varied range of shrub ages and canopy heights, the presence of small rides and clearings, good gradations in edge habitats, varied ground flora etc*'. Although dominated by mature *Crataegus monogyna* (Hawthorn), the scrub resource at *Target Notes 42* and *42a* overall comprises at least nine native woody species and could therefore be described as species-rich as per WBP (2008). However, overall it is not considered to be 'structurally-diverse'.

5.2.8 Although it is unmanaged and comprises areas of lower growing Bramble dominated scrub in between larger mature bushes, and several small, open grass or tall-herb-dominated areas, the resource is considered to be similar in age throughout, having developed on the

former tip site. In addition the field layer is species-poor, with only limited woodland herbs. Considering these factors and that the resource is inherently re-creatable, it is not considered to be of county (Wrexham County Borough) value; it may however be of value in the context of the district.

5.2.9 Other small stands of scrub are located throughout the survey site, both along the ditch (*Target Note 38*) and elsewhere (*Target Notes 37* and *46*). This resource is unlikely to be of more than site value.

Grassland

5.2.10 Grassland dominates much of the survey site (*Target Notes 33, 34, 36* and *39*); the majority of this resource is species-poor neutral rough grassland although patches of more species-rich vegetation occur largely at *Target Notes 33* and *34*. In broad terms this grassland could be considered to be relevant to the UK BAP priority habitat type of lowland meadow (also described as neutral grassland) outlined in BRIG (2008). Although this habitat type principally entails '*most forms of* [agricultural] *unimproved neutral grassland across the enclosed lowland landscapes of the UK*' it does include grasslands in non-agricultural settings. However BRIG (2008) further describes lowland meadow [in terms of National Vegetation Classification plant communities] as including each type of [MG5] *Cynosurus cristatus - Centaurea nigra* grassland, [MG4] *Alopecurus pratensis - Sanguisorba officinalis* floodplain meadow and [MG8] *Cynosurus cristatus - Caltha palustris* flood-pasture. The grassland resource at *Target Notes 33, 34, 36* and *39* does not fit into these NVC types (refer below). Despite this, *Genista tinctoria* (Dyer's Greenweed) (which is present in very low levels of abundance, possibly only one plant, in the grassland at *Target Note 39*) is specifically mentioned in the priority habitat description, as part of a '*specialist group of scarce and declining plant species' associated with this habitat type*'. Dyer's Greenweed, along with *Lathyrus nissolia* (Grass Vetchling) (also present in a very low level of abundance), is a locally scarce plant.

5.2.11 As well as the inclusion of grasslands equating to the NVC types MG4, MG5 and MG8, WBP (2008) also considers that the following types of lowland meadow should be considered for selection (as Wildlife Sites):

- all relatively species-rich neutral grasslands (which could include MG1, MG6 and MG10) of any significant extent; and
- examples of neutral grasslands that contain uncommon species, such as *Carum verticillatum* (Whorled Caraway) or *Ophioglossum vulgatum* (Adder's Tongue).

5.2.12 The grassland resource at *Target Notes 33, 34, 36* and *39*, although potentially a form of MG1 *Arrhenatherum elatius* grassland, is not considered to be 'relatively species-rich'. WBP (2008) further provides a list of species indicative of unimproved neutral grasslands (in south Wales). Although the survey site is in north-east Wales, this list has been interrogated and the grassland resource includes only three of the 'indicator species'. Overall therefore this resource is considered to be of local value.

Ponds

5.2.13 Under the UK BAP priority habitat description, ponds '*are defined as permanent and seasonal standing waterbodies up to two hectares in extent*' that meet one or more of the

listed criteria (BRIG 2008). The ephemeral waterbody within the survey site (*Target Note 45*) is only likely to qualify if it supports any UK BAP priority species, Red Data Book species or legally protected species. No such species has been recorded from this waterbody and it has been noted as being dry for much of the year. It is also unlikely that this waterbody would meet the criteria provided in WBP (2008). As such it is considered to be of no more than site value.

Other Habitats

5.2.14 The habitat resource provided by the ditch at *Target Notes 13* and *18* is considered to be of local value; the locally scarce plant *Potamogeton berchtoldii* (Small Pondweed) was recorded from the ditch and *Carex pseudocyperus* (Cyperus Sedge) was recorded on its banks. Other features within the site such as stands of tall-herb vegetation are of site value.

Flora

5.2.15 Ten plant species of note were recorded within the survey site; *Senecio erucifolius* (Hoary Ragwort), *Lathyrus nissolia* (Grass Vetchling), *Lactuca serriola* (Prickly Lettuce), *Hypericum hirsutum* (Hairy St. John's-wort), *Genista tinctoria* (Dyer's Greenweed), *Potamogeton berchtoldii* (Small Pondweed), *Carex pseudocyperus* (Cyperus Sedge), *Papaver somniferum* (Opium Poppy), *Helminthotheca echioides* (Bristly Ox-tongue) and *Melilotus altissimus* (Tall Melilot). Nine of these plants are identified as 'scarce[11]' in VC50 – Denbighshire while the latter is 'rare[12]' (Green 2006). Prickly Lettuce, Opium Poppy and Tall Melilot are also described as 'established' *i.e.* non-native. Prickly Lettuce is noted as 'locally threatened' in the provisional list of Locally Important/ Endangered Species (WCB 2003). Both Cheffings & Farrell (2005) and Dines (2008) categorise nine of these plants as of 'Least Concern' in the most recent Vascular Plant Red Data List for Great Britain and Wales respectively. *Carex pseudocyperus* (Cyperus Sedge) is listed as 'Near Threatened' in Wales only (Dines 2008). It should be noted that several of the Locally Scarce species listed are likely to be under-recorded in Denbighshire.

5.2.16 WBP (2008) provides a list of vascular plants and criteria for selection of County Wildlife Sites based on this list. However the list is based on three southern welsh counties and would require a degree of interpretation to be applicable across Wales. The only species recorded from the survey site that are included on this list are Cyperus Sedge, Hairy St. John's-wort and Grass Vetchling. All three species are described as 'contributory species'; WBP (2008) outlines that 'any *non-designated site with 5 or more contributory species present*' [should be considered for selection]. Therefore this resource would not be considered of county value. As such populations of these species are unlikely to be of greater than local or district value. Due to the small populations recorded within the survey site they are considered to be of local value.

5.3 Fauna

5.3.1 Evidence of the following species that receive specific legal protection was recorded during past and current surveys:

[11] In Vice County 50, a scarce plant is described as being recorded in 4-15 10 km squares.
[12] In Vice County 50, a rare plant is described as being recorded in 1-3 10 km squares.

- Badger;
- Bats;
- Great Crested Newts; and
- Breeding birds.

5.3.2 Badgers are discussed in a separate confidential annex (Marches Ecology, 2011b).

Bats

5.3.3 No bat roosts have been identified. A small number of trees within the small stand of woodland at *Target Note 44* offer potential roosting opportunities of limited value. These features could be utilised by roosting bats at any time, although they will not be directly impacted by the proposed development scheme.

5.3.4 The frequency that bats are encountered during detailed survey depends on several factors but in particular the number of roosts within or in close proximity to the survey area and the number of individuals in the roost; the availability of quality foraging habitat and the distance to it from a roost; and the quantity and diversity of invertebrates. Two species of bat were recorded foraging/ commuting during the (2007) surveys; Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*). In addition to the legislative protection these species receive both are *Section 42* species and Soprano Pipistrelle is also a UK BAP priority species. Pipistrelle, Whiskered and Brown Long-eared Bats and Noctule have been recorded on Wrexham Industrial Estate in the past.

5.3.5 Both Common and Soprano Pipistrelle were recorded in low numbers, principally foraging/ commuting along both the ditch corridor and the tree-line on the eastern boundary or commuting across the survey site. As the resource provided by the survey site does not appear to comprise vital flight and commuting routes or constitute a priority feeding area, it is unlikely to be considered for selection as a County Wildlife Site as per WBP (2008). The survey site is largely surrounded by light manufacturing and industrial premises. Although pockets of habitat (that may be utilised by bats) do occur in the immediately locality, the survey site represents an extant area of habitat that was previously larger in extent. Considering the low numbers of bats that are thought to utilise the site, the habitat within the site is likely to be of local value only (for foraging/ commuting bats).

Great Crested Newts

5.3.6 The terrestrial habitat within the survey site may be considered to be of high potential value for Great Crested Newts. Great Crested Newts have been recorded within the survey site; three juvenile Great Crested Newts have been recorded at *Target Note 36* in June 2009 and an adult female was recorded at *Target Note 41a* in 2011. In addition, 73 Great Crested Newts were removed from land to the north/ west of the ditch in 2007/2008 during a licensed translocation programme undertaken by Marches Ecology (on behalf of Waste Recycling Group) prior to the construction of the WRCF (Phase I).

5.3.7 Aquatic habitat within the survey site is provided by the ditch (*Target Notes 13* and *18*) and the small, ephemeral waterbody at *Target Note 45*. A maximum of three Great Crested Newts were recorded from the ditch (located within the survey site during surveys in 2007, although a maximum of 11 were recorded from the ditch further north); eggs were also

recorded in this area indicating that the ditch is utilised for breeding. If considered as a separate breeding sub-population, that supported by the ditch is small[13] to medium size. No Great Crested Newts, or eggs have been recorded from the small, ephemeral waterbody at *Target Note 45*.

5.3.8 There may be an additional seventeen waterbodies (not including ditches or streams) within approximately 500 m of the survey site boundary; eleven of these are located within 250 m of which nine are known to support/ have supported Great Crested Newts.

5.3.9 The Great Crested Newt population in the area is likely to form part of a much larger meta-population that may be of at least national importance. The distribution of Great Crested Newts in Wales is described in the Wrexham BAP (Wrexham County Borough 2003):

'*The number of ponds known to have Great Crested Newts in Wales is estimated to be in the region of 500. Of these over 400 are known to occur in North East Wales. Within North East Wales, 200 have been recorded in Wrexham; 160 in Flintshire, 55 in Denbighshire and 3 in Conwy*'.

5.3.10 CCW have indicated that the Great Crested Newt population in north-east Wales (as yet undefined) is of European significance (Matthew Ellis, *pers. comm.*). The undefined meta-population located around the eastern side of Wrexham Industrial Estate is at least medium size and has been known from the area for a considerable time. This species could be considered of international importance as it is protected under European legislation. However the size and stability of the population is likely to determine the value of the resource.

5.3.11 With regards the ditch at *Target Notes 13* and *18;* WBP (2008) regards any site '*supporting 'good populations' of Great Crested Newt, defined here as 10 or more individuals counted by torchlight*' as being potentially selectable as a County Wildlife Site. When this is considered, the ditch could be considered of at least county (Wrexham borough) value.

Birds

5.3.12 Barn Owls are known from the survey site, however there are no opportunities for breeding. The areas of open grassland throughout the survey site support large numbers of small mammals and as such provide potential hunting habitat. Similar areas of grassland are found scattered throughout the Industrial Estate. The Barn Owl is listed on *Schedule 1* of the *Wildlife and Countryside 1981*, the UK and Wales Amber lists and as a locally important species (WCB 2003). The Peregrine is also included on *Schedule 1* but is unlikely to utilise the site to any great extent.

5.3.13 No birds protected under *Schedule 1* of the *Wildlife and Countryside Act 1981* (as amended) are known to breed on the site. Six species of principal importance under the *NERC Act* (Dunnock, Bullfinch, Starling, Song Thrush, Grasshopper Warbler and Reed Bunting) have been recorded; all of which, except Starling and Grasshopper Warbler, bred on the survey site in 2007 and 2010. It is possible that Grasshopper Warbler could breed in the survey site but this species has only been recorded once. A number of other species of conservation interest (identified as UK BAP priority species or Birds of Conservation Concern) were also recorded.

[13] A population can be classed as 'small' for a maximum count of up to 10 (English Nature 2001).

5.3.14 The mature, dense scrub located on the former tip, the ditch-side scrub and the scattered scrub/ rough grassland mosaic (*Target Notes 38, 39* and *42*) are the most valuable habitat types within the survey site for breeding birds. Some species (*e.g.* Whitethroat) will also utilise stands of tall-herbs and low-growing Bramble scrub. These habitat types are characteristic of pretty much all of the survey site. Scrub can typically support a diverse and species-rich breeding bird community, predominantly of small birds. All of the breeding bird species recorded on the survey site can be considered as scrub-nesters, although some will breed in other habitat types. Two of the species of principal importance (*NERC Act 2006*) are strongly linked with this habitat type; Song Thrush and Bullfinch (Fuller 1980). The Reed Bunting is less likely to use dense scrub and is usually found near wetland habitats. The former species also has an associated Species Action Plan (Wrexham BAP). The density of scrub is important because sparse scrub holds fewer species and the number of individual birds also rises as the scrub thickens (Fuller *op. cit.*). Woodcock has also been recorded from the survey site; this is included on the UK and Wales Amber lists and is a locally important species (WCB 2003).

5.3.15 WBP (2008) includes an assessment of bird species which are considered to be of conservation significance within (south) Wales; '*breeding birds of conservation significance*' and '*wintering and passage birds of conservation significance*'. Although provided for south Wales some interpretation can be made for north-east Wales. No species whose (breeding) presence would automatically warrant Wildlife Site designation has been recorded from the survey site. Only three 'contributory species' (Bullfinch, Reed Bunting and Song Thrush) were recorded breeding in 2007 and 2010. A further five contributory species (Barn Owl, Peregrine, Woodcock, Grasshopper Warbler and Linnet) have been recorded from the survey site. WBP (2008) states that for '*the presence of an assemblage of 'contributory species' to be a justification for Wildlife Site designation in its own right, there should be a minimum of at least 8-10* [breeding] *species in summer depending on habitat (wetland, woodland and/or grassland)*'. It is therefore unlikely that the site would warrant designation. Overall, therefore it is considered unlikely that the breeding bird assemblage at the site is greater than district value.

5.3.16 No survey of wintering birds has been undertaken at the site, although it is not thought likely that the site would meet any of the criteria outlined in WBP (2008).

Other Species

5.3.17 Habitat that could potentially support several species that receive specific legal protection is also present. None of these species was recorded (in the survey site) during detailed surveys for them. These species are as follows:

- Water Vole;
- Otter; and
- Reptiles.

5.3.18 No signs of Water Vole or Otter were recorded during the presence/ absence surveys in 2007 and 2010. The habitat provided by the ditch is considered to be sub-optimal for Water Vole and there are no records for this species from SJ34 on the NBN Gateway. The likelihood that Water Voles could utilise the survey site is considered to be low/ negligible.

5.3.19 The ditch could 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; it 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). The likelihood that Otter utilises the survey site is considered to be low/ negligible. Otter has a SAP in the Wrexham BAP.

5.3.20 No reptiles were seen during the presence/ absence survey undertaken in 2007 which indicates that a significant population was not present on the survey site at that time. A 1999 record for both Slow-worm and Adder is known for SJ3849, the same 1 km grid square as the survey site. The habitat on the survey site (principally the rough grassland) is considered to be of potentially high quality (for reptiles). Reptiles are known to utilise similar sites on the Industrial Estate. The Grass Snake is known to have a large home range. Many parts of the survey site may be suitable for this species and in particular the corridor associated with the ditch. This species often hunts along such features, especially where they support good amphibian populations. As such it is possible that this species may traverse the survey site.

5.3.21 In addition to species that receive specific legal protection the survey site supports a number of other species identified in the provisional list of Locally Important/Endangered Species (WCB 2003):

- Common Frog;
- Common Toad;
- Smooth Newt; and
- European Eel.

5.3.22 The amphibian populations (other than Great Crested Newt) supported by the site can be considered to be of at least district importance. The Common Toad is a *Section 42* species and a UK BAP priority species. On this basis the local Common Toad population could be considered to be of north-east Wales value but is more likely to be of county value. It may meet the criteria for consideration as a Wildlife Site due to an 'exceptional' population (WBP 2008). WBP (2008) also states that sites with 'good' populations of three or more species of amphibian (excluding Great Crested Newt) could be considered. The Common Frog, Common Toad and Smooth Newt populations are likely to meet this criteria.

5.3.23 The European Eel is a *Section 42* species; it was recorded in the ditch at *Target Note 13* although the size of the population is unknown. WBP (2008) provides a list of species entitled '*Freshwater fish of conservation significance in Wales (provisional)*'; European Eel is on this list. It further states that '*waterbodies supporting resident populations of any species listed*' should be considered for selection [as a County Wildlife Site]. On this basis the ditch at *Target Notes 13* and *18* may be of county (Wrexham borough) value for the Eel population that it supports.

5.3.24 In addition, the Cinnabar moth (*Tyria jacobaeae*) and Small Heath (*Coenonympha pamphilus*), both recorded from the survey site, are UK BAP priority and *Section 42* species. Joy & Bourn (1998) identifies Small Heath as a low priority and state that it is 'widespread and common' in Wales. This status could also be applied to the Cinnabar.

5.4 Summary of Ecological Value

Table 15 – Ecological Evaluation of the Survey Site.

Ecological Resource	Resource Value	Notes
Wildlife Site	County (Wrexham borough)	
Woodland (*Target Note 44*)	Local	A small area of species-poor secondary woodland.
Scrub (*Target Note 42*)	District	Species-rich (in terms of its woody shrub component) as defined by WBP (2008) although not 'structurally-diverse'.
Scrub (*Target Notes 37* and *38*)	Site	Small stands of species-poor scrub.
Grassland (*Target Notes 33, 34, 36* and *39*)	Local	Largely species-poor and rank.
Other habitats	Site	Ditch at *Target Notes 13* and *18*, stands of tall-herb vegetation and small ephemeral waterbody at *Target Note 35*. Refer below for value of ditch to individual species.
Flora (VC50 Scarce/ Rare plants)	Local	The survey site supports generally small populations of Hoary Ragwort, Grass Vetchling, Prickly Lettuce, Hairy St. John's-wort, Dyer's Greenweed, Small Pondweed, Cyperus Sedge, Opium Poppy, Bristly Ox-tongue and Tall Melilot. Several of these species are considered to be under-recorded, Prickly Lettuce, Opium Poppy and Bristly Ox-tongue are non-native.
Bats (foraging habitat only and commuting)	Local	The site is used by small numbers of two species of bat; Common and Soprano Pipistrelle. Doesn't meet the criteria in WBP (2008).
Great Crested Newt breeding population	National	CCW have indicated that the Great Crested Newt population in north-east Wales (as yet undefined) is of European significance (Matthew Ellis, *pers. comm.*). The undefined meta-population located around the eastern side of Wrexham Industrial Estate is at least medium size and has been known from the area for a considerable time. This species could be considered of international importance as it is protected under European legislation. However the size and stability of the population is likely to determine the value of the resource.

Ecological Resource	Resource Value	Notes
Other amphibians	County (Wrexham borough)	Medium/large populations of Common Frog, Common Toad and Smooth Newt all of which are identified as Locally Important by the Wrexham BAP. The Common Toad is a UK BAP priority species/ *Section 42* species. Assemblage of amphibians (excluding Great Crested Newt) meet WBP (2008) criteria.
Breeding birds	District	Unlikely to meet the criteria in WBP (2008). A number of [largely] widespread species of conservation interest have bred at the site. Several Locally Important species identified in the Wrexham BAP also use the site.
Wintering birds	Local	Unlikely to meet the criteria in WBP (2008), although no specific survey undertaken.
Barn Owl (hunting only)	Local/ district	A single Barn Owl has been observed on the survey site. It is not known whether the site is included within a breeding territory.
European Eel – habitat provided by ditch at *Target Notes 13* and *18*	County (Wrexham borough)	Ditch fulfils WBP (2008) criteria for selection as a County Wildlife Site on basis of supporting European Eel.

6 IMPACT ASSESSMENT

6.1 Assessment Methodology

Introduction

6.1.1 The impact assessment process broadly uses and adapts the key concepts and approach proposed in IEEM (2006). These Guidelines have been endorsed by, among other organisations, The Countryside Council for Wales, The Environment Agency and The Wildlife Trusts.

6.1.2 Specific potential impacts were identified through consideration of the development proposal using available guidance and professional judgement.

Valuation of Ecological Resources

6.1.3 At the start of the impact assessment process the value of the various ecological resources (sites, habitats, species) was determined. This process has been completed in the previous section of this EcIA. According to IEEM (2006) the value or potential value of an ecological resource should be determined within a defined geographical context. The following table uses the recommended frame of reference, adapted to meet local circumstances and with reference to earlier drafts of the IEEM Guidelines.

Table 16 – Valuation of Ecological Resources.

Resource Value	Examples
International	• An internationally designated/ candidate site (*e.g.* SPA, SAC, Ramsar, Biogenetic Reserve) or an area which the Countryside Council for Wales has determined meets the published criteria for such designation, irrespective of whether or not it has been notified. • A viable area of a habitat type listed in *Annex I* of the Habitats Directive, or smaller areas of such habitat which are essential to maintain the viability of a larger whole. • Any regularly occurring population of an internationally important species, which is threatened or rare in the UK. *i.e.* it is a UK Red Data Book species or listed as occurring in 15 or fewer 10 km squares in the UK (categories 1 and 2 in the UK BAP) or of uncertain conservation status or of global conservation concern in the UK BAP. • A regularly occurring, nationally significant population/number of any internationally important species.
National	• A nationally designated site (SSSI, NNR) or a discrete area, which the Countryside Council for Wales has determined meets the published selection criteria for national designation irrespective of whether or not it has yet been notified. • A viable area of a priority habitat identified in the UK BAP, or of smaller areas of such habitat which are essential to maintain the viability of a larger whole. • Any regularly occurring regionally significant population/ number of any nationally important species. • A feature identified as of critical importance in the UK BAP.
Northeast Wales[14]	• Viable areas of key habitat of regional value or smaller areas of such habitat which are essential to maintain the viability of a larger whole. • Any regularly occurring, locally significant population of a species listed as being nationally scarce which occurs in 16-100 10km squares in the UK. • A regularly occurring, locally significant number of a regionally important species. • Sites which exceed the County Wildlife Site (CWS) designation criteria in accordance with WBP (2008) but fall short of SSSI selection guidelines, where these occur.
Wrexham (borough)	• Semi-natural ancient woodland greater than 0.25ha. • Wrexham sites and other sites which the designating authority has determined meet the published ecological selection criteria for designation, including Local Nature Reserves (LNRs) selected on regional ecological criteria and CWS's. • A viable area of habitat identified in the Wrexham BAP. • Any regularly occurring, locally significant population of a species which is listed in a local "red data book" or BAP on account of its regional rarity or localisation. • A regularly occurring, locally significant number of Wrexham important species.
District	• Semi-natural ancient woodland smaller than 0.25ha. • Areas of habitat identified in the Wrexham BAP. • Sites that the designating authority has determined meet the published ecological selection criteria for designation, including LNRs selected on district ecological criteria where available. • Sites/ features that are scarce within the district or which appreciably enrich the district habitat resource. • A diverse and/ or ecologically valuable hedgerow network. • A population of a species that is listed in the Wrexham BAP because of its rarity in the locality. • A regularly occurring, locally significant number of a District important species during a critical phase of its life cycle.
Local	• Areas of habitat considered to appreciably enrich the habitat resource within the context of the parish or neighbourhood. • CWS's and LNRs selected on parish ecological criteria where available.
Within Zone of Influence	• Areas of habitat considered to appreciably enrich the habitat resource within the context of the site (zone of influence).

[14] Wrexham, Denbighshire and Flintshire.

Significance Criteria

6.1.4 In order to determine the significance of any given impact the magnitude of each potential impact is identified and subsequently assessed against the value of the ecological resource using a simple matrix. This diverges somewhat from the approach recommended in IEEM (2006), but is based on previously published and established guidance (*e.g.* Department for Transport 2004). It is deemed justifiable in this instance to maintain a transparent and simple approach. The magnitude of impact was determined using the scale in the table below. This magnitude of impact scale builds in the extent and duration of the impact, reversibility, timing and frequency as well as the magnitude (IEEM 2006).

Table 17 – Magnitude of Impact.

Magnitude	Criteria
Major negative	The proposal (either on its own or with other proposals) may adversely affect the integrity of the site, in terms of the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or population levels of special interest. Change is likely to cause a permanent or long-term (more than 10 years) adverse impact.
Intermediate Negative	The site's integrity will not be adversely affected, but the effect on the site is likely to be significant in terms of its ecological objectives. If, in the light of full information, it cannot be clearly demonstrated that the proposal will not have an adverse effect on the integrity, then the impact should be assessed as major negative. Change is likely to have an adverse impact, but recovery is predicted in the medium term (5-10 years) and there is predicted to be no permanent impact.
Minor Negative	Neither of the above applies, but some minor negative impact is evident. Change is likely to have an adverse impact, but recovery is predicted in the short term (0-4 years) and there would be no impact on the integrity of the resource.
Neutral	No observable impact in either direction.
Positive	Impacts which provide a net gain for biodiversity overall.

6.1.5 The magnitude of the potential impact(s) on each ecological resource is then used to derive a measure of the impact significance using the matrix below. Effects categorised as Moderate or Large are considered to be significant. Effects categorised as Slight or Neutral are considered to be not significant. Other adverse impacts may be considered important at the relevant geographical scale.

Table 18 – Significance of Impact.

Magnitude of Potential Impact	Value of Ecological Resource						
	International	National	Northeast Wales	Wrexham (borough)	District	Local	Site
Major Negative	Very large adverse	Very large adverse	Large adverse	Moderate adverse	Moderate adverse	Slight adverse	Slight adverse
Intermediate Negative	Large adverse	Large adverse	Moderate adverse	Moderate adverse	Slight adverse	Slight adverse	Neutral
Minor Negative	Moderate adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Slight adverse	Neutral
Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Positive	Large beneficial	Large beneficial	Moderate beneficial	Moderate beneficial	Slight beneficial	Slight beneficial	Neutral

Assessment of Residual Impacts

6.1.6 Following identification of impacts and assessment of the potential significance (*Section 6.2*), mitigation measures are proposed (*Section 6.3*) that seek to minimise or nullify such impacts. Mitigation measures address all adverse impacts whether or not they are deemed

significant. Residual impacts are those that remain after implementation of the mitigation measures. Assessment of the residual impacts is completed in *Section 6.4*. Impacts that may result in a slight adverse (not significant) impact have been included to ensure a robust approach to the proposed mitigation/ compensation measures.

6.2 Identification and Assessment of Impacts

Introduction

6.2.1 This section identifies the primary potential impacts of the proposed development where known. The impact on valued ecological resources (see *Table 15*) is subsequently completed. Summary information pertaining to the proposed development is provided in *Section 1.3*. Detailed information is included in the relevant chapter of the Environmental Statement (ES). This impact assessment is based on the following documents/ plans:

- Environmental Statement that accompanies this planning application (Noise, transport, air quality, landscape & visual chapters).
- ACS Consulting (2011). *Wrexham Phase II Eco Park, Bryn Lane, Wrexham– Arboricultural Implication Study, July 2011*. Unpublished report produced on behalf of Stratus Environmental Ltd.
- Terraconsult (2011). *Phase 2 Recycling and Recovery Park, Bryn Lane, Wrexham – Remediation Strategy Report. July 2011, Report no. 1456-07*. Unpublished report produced on behalf of WRG.
- The 'Landscaping Proposals' plan (Dwg. No. WR7042/19/12 dated 7th September 2011).

Protected Sites

6.2.2 No statutory protected sites will be directly impacted by the proposed development. The nearest statutory protected site is Afon Dyfrdwy (River Dee) Site of Special Scientific Interest (SSSI)/ River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid (Wales) Special Area of Conservation (SAC). This lies approximately 2.45 km to the east (SSSI)/ 2.83 km to the south-east (SAC) of the survey site at its nearest point. Due to the nature and limited scale of the proposed development, no in-direct impacts are predicted on this protected site. Although the flow in the ditch (*Target Notes 13* and *18*) is almost imperceptible it eventually runs into the River Dee some 3 km to the north-east. However the upstream sections of the ditch held very little surface water throughout much of spring 2007, were dry in summer 2011 and are heavily silted. As such it is likely that any uncontrolled discharge to the ditch would be deposited long before it reaches the River Dee.

6.2.3 Terraconsult (2011) outlines measures to be implemented during remediation of the site to avoid any impacts on potential ecology receptors. This report states '*There is no significant risk to either groundwater or surface waters from any of the tested contaminants if they are left undisturbed*' and that '*No special precautions are required due to potential contaminants with respect to potable water supplies or for the effect of potential contaminants on ecological receptors*'. However it does recognise potential risks particularly during remediation/ construction of the proposed development, for example, re-mobilisation of PCBs. However the Remediation Strategy outlines a range of mitigation measures to ensure as far as is possible that the proposed development will not result in any pollution events. One such measure is for the attenuation lagoon to be constructed early during the

remediation/ construction phase with surface water subsequently being diverted to this feature for the remainder of the works.

6.2.4 Importantly with regard PCBs the report states that '*concentrations were lower during the construction period and post construction of Phase I relative to the baseline period indicating that there has been no adverse impact on the quality of water in the ditch. The construction of the Phase I facility may have contributed to an improvement of water quality with the lowest concentrations being measured post-construction*'. It is considered likely that the proposed Phase II development would result in a similar improvement of water quality largely due to the control measures for surface water run-off. For further detail Terraconsult (2011) should be referenced.

6.2.5 The Air Quality chapter in the ES considers potential impacts of fugitive dusts and odours, and combustion pollutants during construction and operation. A range of mitigation measures are proposed to avoid/ minimise impacts during the construction period (particularly dust). Atmospheric emissions during operation are also reviewed. It concludes that '*It is anticipated that any potential fugitive release of odour and bio-aerosols associated with on-site storage and handling of waste will be minor and will be contained effectively within the main building, and likely to have a negligible impact on local air quality*'. Residual emissions from the biofilter stack are also considered. No impacts on off-site ecological receptors are perceived. For further detail the relevant ES chapter should be consulted.

6.2.6 One non-statutory protected site (Wrexham Industrial Estate Wildlife Site: Bryn Lane) will be directly impacted by the proposed development although no part of it would be included in an 'operational area'. This site is partly within the survey site considered for this EcIA; it comprises a mosaic of neutral grassland (mostly species-poor although small, more species-rich stands, occur in the north of this site), scrub and tall-herb vegetation. The entire area of the Wildlife Site within the proposed development site is to be included within a 'compensation area'. As such it will be subject to long-term management principally for the benefit of Great Crested Newts but also other species (particularly Badger and breeding birds) and habitats (particularly species-rich grassland and scrub). The compensation area and its long-term management are further discussed below. This direct impact is likely to be positive on a resource of county value. The potential impact is therefore likely to be moderate beneficial and significant.

6.2.7 The Air Quality chapter of the ES concludes that '*As a consequence of containing potentially odorous and dusty process activities within a fully enclosed building, with an associated biofilter abatement plant, effective control of fugitive odour and dust emissions from the waste treatment activities will be achieved*'. However '*a negligible residual impact on air quality attributable to vehicle movements*' is predicted but further clarifies that this would not be significant. As such no indirect impacts on the Wildlife Site are predicted.

Habitat

General

6.2.8 The layout of the proposed development site has been configured from an early stage in the design process to work within physical and other constraints as well as to minimise impacts on the ecological resource. As such permanent habitat loss will be limited to areas of mature dense scrub, scattered scrub, tall ruderal vegetation and species-poor neutral grassland. A

short section of the ditch (*Target Note 13*) would also be impacted when the site access from Phase I is formed. Key impacts (in terms of habitat loss) are likely to be associated with the loss of the dense mature scrub at *Target Note 42* and part of the grassland/ scattered scrub mosaic at *Target Note 39*.

6.2.9 Broadly the development will result in the loss of the following habitats:

- Dense scrub (approximately 0.84 hectares: 8357.6 m^2);
- Unimproved neutral grassland/ scattered scrub mosaic (approximately 1.32 hectares: 13163 m^2);
- Tall-ruderal vegetation (approximately 0.33 hectares: 3302 m^2); and
- A short section of ditch (approximately 12 metres).

6.2.10 Approximately 2.2 hectares (22008 m^2) would be included within the proposed 'operational area' although only 1.47 hectares (14684 m^2) would be permanently lost to built development. The proposed ecological compensation area would extend to 1.8 hectares (18012 m^2). This would achieve a 55%: 45% split of operational area to compensation area. The proposed landscaping would extend to 0.73 hectares (7332 m^2) and is currently included in the total for the operational area. The proposed compensation area and operational area are defined on the 'Landscaping Proposals' plan (Dwg. No. WR7042/19/12 dated 7th September 2011).

Scrub

6.2.11 The entire resource of dense mature scrub/ scrub-woodland at *Target Note 42* as well as part of the resource aligned along the eastern/ southern bank of the ditch (*Target Note 38*) would be permanently lost. This scrub, particularly at *Target Note 42*, is species-rich in terms of the woody component and can be considered to be mature. As such it has been assessed as being of district value. It is the largest continuous block of scrub habitat within the Phase II site. However it has developed on a spoil tip, is secondary in nature, and as such is recreatable. Due to the age of the scrub it is likely to take more than 10 years to establish a similar resource. The magnitude of impact is considered to be major negative on a resource of district value. The potential impact is therefore likely to be moderate adverse and significant. The scrub at *Target Note 38* is of site value. The potential impact on this resource is therefore likely to be slight adverse and not significant.

6.2.12 Scattered scrub (mostly Hawthorn and Bramble) located within part of the grassland mosaic at *Target Note 39* will also be lost. This impact (on the habitat) is further considered below as part of the grassland resource.

Grassland

6.2.13 A large part of the unimproved grassland/ scattered scrub at *Target Note 39* would be permanently lost. The grassland that would be lost can all be considered to be species-poor although a small number of individuals of locally scarce plants are present. Plant species of note are further considered below. The more species-rich areas of grassland are located within the Wildlife Site and are all to be retained (*e.g. Target Notes 33* and *34*). The retained grassland resource would be contiguous with other areas of neutral grassland (both created and retained) both within the Phase I and the Phase II sites. It is likely that all of this grassland is secondary and could be considered to be recreatable in the short to medium-

term. The magnitude of impact is considered to be intermediate negative on a resource of district value. The potential impact is therefore likely to be slight adverse and not significant.

Other habitat

6.2.14 Approximately 12 m of the ditch (*Target Note 13*) will be temporarily impacted due to the construction of the access between Phase I and Phase II. While this may be considered a temporary impact as the functioning of the ditch will not be affected beyond the short-term it is likely that the habitat within the footprint of the access route would be permanently lost/ altered. The ditch will also be sensitive to run-off, dust and other forms of pollution, such as accidental spillage, during construction works and run-off during site operation. The magnitude of impact is considered to be minor negative on a resource of local value. The potential impact is therefore likely to be slight adverse and not significant.

6.2.15 The stands of tall ruderal vegetation at *Target Notes 42* and *42a* and the ephemeral waterbody at *Target Note 45* would also be permanently lost. While the amenity grassland beneath the proposed solar array would not be permanently lost it is likely to be subject to extensive disturbance during construction. These impacts are similarly considered to be not significant.

Adjacent Habitat

6.2.16 All of the retained/ created habitat will be vulnerable to dust deposition and or uncontrolled substance release, the former during the construction period; the latter during both construction and operation. The woodland at *Target Note 44* is located directly adjacent to the proposed operational area. Due to the proposed cut-and-fill operation and other construction activities the eastern edge of this woodland in particular may be affected. However appropriate mitigation measures are outlined in both the Remediation Strategy and the Air Quality chapter of the ES. Such indirect impacts are only likely to be short-term. Similarly the retained grassland and scrub within the proposed compensation area could be affected, largely within close proximity to the proposed operational area. The magnitude of impact is considered to be minor negative on resources of site or local value. The potential impact is therefore likely to be neutral or slight adverse and not significant.

6.2.17 The impact following provision of the newly created habitat is assessed below under *Residual Impacts* (*Section 6.4*).

Flora

6.2.18 Ten plant species of note were recorded within the survey site; *Senecio erucifolius* (Hoary Ragwort), *Lathyrus nissolia* (Grass Vetchling), *Lactuca serriola* (Prickly Lettuce), *Hypericum hirsutum* (Hairy St. John's-wort), *Genista tinctoria* (Dyer's Greenweed), *Potamogeton berchtoldii* (Small Pondweed), *Carex pseudocyperus* (Cyperus Sedge), *Papaver somniferum* (Opium Poppy), *Helminthotheca echioides* (Bristly Ox-tongue) and *Melilotus altissimus* (Tall Melilot). Of these species only Opium Poppy is entirely known from within the proposed operational area: this species is not native. Small amounts of Grass Vetchling, Bristly Ox-tongue, Hairy St. John's-wort and Dyer's Greenweed may also be lost. However all of these species are also present within the retained areas of habitat and in nearly all cases in greater

amounts (than they are found in the operational area) with the exception of the latter species.

6.2.19 Small Pondweed and Cyperus Sedge would not be directly impacted by the proposed development as they are located within/ along the banks of the ditch. They may be subject to indirect impacts due to uncontrolled run-off during the construction and operation phases (this is further discussed below). While the size of the populations of these species has not been monitored both plants have been recorded along the ditch since the construction of Phase I. The magnitude of impact is considered to be minor negative on a resource of local value. The potential impact is therefore likely to be slight adverse and not significant.

Fauna

General

6.2.20 The construction phase is likely to extend over a 12 month period. During construction there will be some form of disturbance of species from both the proposed development site and a wider zone of influence. Disturbance will result through increased traffic; the activities of the labour force, soil movement/ storage and a variety of construction activities *e.g.* site clearance, piling and erection of the new building. The Transport chapter in the ES states that during '*the construction phase HGV traffic movements are likely to be less than 60 HGVs a day, lower than the expected levels associated with the operational phase*'. Species that currently use the proposed development site are likely to be displaced. Related disturbance will be temporary, for the duration of the construction phase and fairly local in extent.

6.2.21 Detailed surveys have shown the likely absence of reptiles from the proposed development site/ survey site. Reptiles are therefore not considered further in this impact assessment, although due to the time that has elapsed since the reptile survey (2007) and the particular potential for Grass Snake to hunt along the ditch that is located to the north /west of the development site a precautionary approach is advocated (*Section 6.3*). Although the ditch at *Target Notes 13* and *18* is potentially suitable for Water Vole (albeit of sub-optimal quality) and Otter no signs have been recorded for either species during detailed surveys. These species are not considered further in this impact assessment. The ditch is known to support European Eel. However as limited direct or indirect impacts on the ditch are predicted (refer to 'habitat' section above) this species is not considered further in this impact assessment. Impacts on Badgers are considered in Marches Ecology (2011b).

Bats

6.2.22 Two species of bat have been recorded from the survey site; no roosts were identified and there are no trees or other features that have the potential to support bat roosts within the proposed development site. There are therefore no direct impacts on known roosts, or potential roost sites, associated with the proposed development.

6.2.23 A small number of trees located within the small stand of woodland (*Target Note 44*) to the immediate west of the development site offer potential roosting opportunities of limited value; they will not be directly impacted by the proposed development as this resource is to be retained as part of the compensation area. Some trees at this location will be felled but they are not considered to be of any potential value for roosting bats. However, bats that might

be using the trees with potential value as a roost may be subject to varying levels of disturbance (during the construction phase). As this potential impact is of a temporary nature the magnitude is considered to be minor negative. However as no roosts are known the significance of this potential impact cannot be assessed.

6.2.24 Bats were not recorded foraging or commuting within/ around the scrub that currently dominates the spoil tip (*Target Note 42*). Overall both Common and Soprano Pipistrelle were recorded in low numbers, principally foraging/ commuting along the ditch corridor and the tree-line on the eastern boundary or commuting across the survey site. However the fringes of the scrub do provide potential foraging/ commuting opportunities; this potential resource would be lost as a result of the proposed development.

6.2.25 Many small bat species rely on linear features, such as the edges of scrub/ woodland or hedgerows, for commuting from roosts to favoured foraging areas. However the Pipistrelle (*Pipistrellus* spp.) (which is the most frequently occurring species in urban or semi-urban locations) regularly flies over open spaces/ in and around buildings including apparently hostile habitat. Therefore the loss of the scrub resource from the spoil tip is not likely to prevent Pipistrelle bats foraging/ commuting across the (survey) site. Furthermore the ditch corridor would largely remain unaffected and the habitat near the eastern boundary would be retained within the proposed compensation area. As such both features within the site identified as being used for foraging/ commuting would largely be unaffected. Should any existing flight-line be interrupted it is likely that bats following such a route would adopt an alternative suitable linear feature. As previously stated (*Section 5*) the site is not currently thought to be of particular importance for bats. Overall the magnitude of impact due to the loss/ indirect impact (*e.g.* disturbance/ lighting) on the foraging habitat of these two species is considered to be minor negative on a resource of local value. The potential impact is therefore likely to be slight adverse and not significant.

6.2.26 External and street lighting can prevent bats from using their commuting routes and foraging areas. Fast-flying species such as Pipistrelles and Noctules are less affected and often attracted to bright lights to feed on insects but this in turn leaves them more vulnerable to predation (Jones, 2000). Most species of bat prefer their commuting routes to be dark. As such external lighting on the proposed building/ within the operational area has the potential to disrupt commuting/ foraging routes particularly in close proximity to the ditch corridor (*Target Note 13*) and any features to be provided in mitigation/ compensation. It should be noted that these features are already subject to varying levels of diffuse light pollution. There is currently no detailed design for external lighting available however it is likely that there would be lighting along the fence to the east of the facility and the external elevations of the building. There would be low level security lighting at night. The magnitude of impact due to poorly designed lighting in these areas may be considered to be minor negative (due to the species concerned) on a resource of local value. The potential impact is therefore likely to be slight adverse and not significant.

Great Crested Newts

6.2.27 Potential impacts on Great Crested Newts include:

- (Indirect) modification of aquatic habitat;
- (Permanent) loss/ modification of terrestrial habitat (foraging/ hibernation and dispersal resource);

- (Temporary) loss/ modification of terrestrial habitat (foraging/ hibernation and dispersal resource);
- (Temporary) fragmentation of habitat;
- Potential for killing/ injury/ disturbance of individuals during construction and operation; and
- Increased disturbance during the construction period.

6.2.28 No aquatic habitat will be directly lost due to the proposed development. However a short stretch (approximately 12 m) of aquatic habitat would be modified where the access road linking the Phase I and Phase II development sites crosses the ditch (*Target Note 13*). Once this road has been constructed the ditch would be reinstated and remain available to Great Crested Newts although this stretch would no longer be suitable for breeding. The only other direct impact on the ditch as a result of the proposed development will be the construction of an outflow pipe from the surface water lagoon. The modification of this stretch of potential breeding habitat is unlikely to affect the integrity of the breeding population that utilises the ditch beyond the short-term (due to the amount of remaining habitat available). The magnitude of this impact would be minor negative on a resource of national value. The potential impact is likely to be slight adverse and not significant.

6.2.29 The ditch along the northern boundary will be sensitive to run-off, dust and other forms of pollution, such as accidental spillage, during both construction and operation phases. It should be noted that due to past industrial use the water quality of the ditch may be poor. In addition the channel has been modified and currently receives uncontrolled surface water run-off from the site that drains through made-ground. This ditch has supported a medium size population of breeding Great Crested Newts. The main arisings of water would be from rainfall and risk would be for surface water to escape from the site contaminating the ditch. Release/ quality of surface water from the Phase I development is controlled via an oil separator and shut-off gate, into a surface water lagoon. Similar drainage features are proposed for the Phase II development. Further information is provided in the relevant chapter of the ES. The lagoon would be designed to collect surface water and allow any solids within it to settle out prior to discharge into the adjacent ditch in agreement with the Environment Agency Wales. Surface water would transfer to the existing drainage ditch via a further shut-off gate. The installation of an efficient drainage system incorporating pollution control measures is likely to improve outputs to the ditch. The magnitude of impact is likely to be neutral. The potential impact is likely to be neutral and not significant.

6.2.30 Accidental releases during the construction phase are only likely to be of a temporary nature. As stated above both the Remediation Strategy and Air Quality chapter in the ES detail appropriate mitigation measures to avoid/ minimise any such potential impacts. Should the ditch be polluted by surface water run-off during construction the magnitude of impact is likely to be minor negative. The potential impact is likely to be slight adverse and not significant.

6.2.31 The main impact on the local Great Crested Newt population of the proposed development is likely to be the loss of approximately 1.47 hectares of terrestrial habitat including dense scrub (*Target Note 42*) and rough grassland/ scattered scrub (*Target Note 39*). The terrestrial habitat within the site is considered to be of high potential value for Great Crested Newts. Great Crested Newts are known to utilise the terrestrial habitat within the proposed development site (*Target Note 41a*).

6.2.32 Although Great Crested Newts can travel over 1 km from breeding sites most inhabit an area much smaller than this. There is a great deal of variation but Great Crested Newts commonly move between ponds that are within 250 m of each other (English Nature 2001). The closest known waterbody where Great Crested Newts breed is the ditch that is located along the northern boundary of the proposed development site. If considered as a separate breeding sub-population, that supported by the ditch is small to medium size. There may be an additional seventeen waterbodies (not including ditches or streams) within approximately 500 m of the proposed development site; eleven of these are located within 250 m of which nine are known to support/ have supported Great Crested Newts.

6.2.33 The proposed development would result in the permanent loss/ modification (most of the operational area would be characterised by buildings and hard-standing) of the following:

- immediate terrestrial habitat (<50 m from breeding pond) associated with a single ditch;
- intermediate terrestrial habitat (50 to 250 m from breeding pond) associated with nine ponds; and
- the distant terrestrial habitat (>250 m from breeding pond) associated with a further four ponds.

One of the ponds for which the proposed development site potentially represents intermediate habitat (number 11 on *Figure 4*) is located on the other side of the newly constructed WRCF; there is considered unlikely to be much (if any) use of the terrestrial habitat provided by the proposed development site by individuals from this pond.

6.2.34 The proposed operational area will occupy approximately 55% of the surface area of the Phase II site. As such 45% will constitute the proposed compensation area (the compensation area is further discussed in *Section 6.3* below). The compensation area along with the proposed landscaping totals 2.53 hectares (25344 m^2) of the site that would remain available to Great Crested Newts. The compensation area is also contiguous with the ditch corridor and more-or-less with the Phase I mitigation area to the north. These areas will remain available to the population that utilise the ditch and waterbodies elsewhere. On the assumption of absolute loss of 1.47 hectares of high quality immediate terrestrial habitat the magnitude of impact is likely to be intermediate negative (on the population that inhabits the ditch). The potential impact is likely to be large adverse and significant.

6.2.35 The proposed development would also result in the temporary loss/ modification of smaller areas of terrestrial habitat associated with the proposed solar array, landscaping and towards the eastern edge of the operational area where directly adjacent habitat may be impacted during the construction phase. As the proposed landscaping includes areas of grassland, scrub planting and an attenuation lagoon is to be constructed these created habitats are likely to be of potential value for Great Crested Newts once established in the short-term. The magnitude of this impact is therefore considered to be minor negative. The potential impact is likely to be slight adverse and not significant.

6.2.36 Any Great Crested Newts that may currently traverse across the proposed development site may be prevented from doing so during the construction phase and, where associated with permanent habitat loss, the operation phase. However due to the scale of the proposal alternative dispersal routes are likely to be available (*e.g.* the ditch corridor would be retained more-or-less intact). Furthermore all of the ponds known to support/ have supported Great

Crested Newts within 500 m of the site are located to the north/ east/ west of the ditch located on the northern site boundary. As such Great Crested Newts that inhabit the ditch are considered most likely to disperse/ migrate in these directions rather than south across the proposed development site. No impacts due to potential fragmentation are envisaged beyond the short-term. The magnitude of this impact would be minor negative. The potential impact is likely to be slight adverse and not significant.

6.2.37 Kerbstones and gulley-pots can represent a serious barrier to amphibian movements. During surveys for the Phase I development a number of animals were found trapped in gulley-pots along the HRC access road. This access road is thought to be aligned across a dispersal route (between the ditch and habitat/ ponds to the north). As indicated above it is considered unlikely that the proposed development is located on an important dispersal/ migration route. However the habitat within this area is likely to be used for foraging/ hibernation. As such there is a risk that small numbers of Great Crested Newts could be impacted by any surface water drainage features installed within the operational area. No detail with regard such drainage features is currently available. The magnitude of impact could be intermediate negative. The potential impact is likely to be large adverse and significant.

Birds

6.2.38 Potential impacts on birds include:

- Loss of nesting habitat/ reduction in territory availability;
- Loss of feeding resource;
- Loss of shelter/ roost sites;
- Fragmentation of habitat; and
- Increased disturbance during the construction/ operation phases.

6.2.39 The proposed development would result in the loss of approximately 0.84 hectares of mature scrub/ scrub woodland and 1.32 hectares of grassland/ scattered scrub. A short stretch of ditch would also be modified. Known nest locations/ territories (from 2007) that would be directly (either entirely or partly) impacted include: Dunnock (1-2 pairs), Bullfinch (1 pair), Chaffinch (1 pair), Goldfinch (1 pair), Greenfinch (1 pair), Blackbird (2 pairs), Robin (2-3 pairs), Wren (3 pairs), Willow Warbler (2-3 pairs), Whitethroat (2 pairs), Blackcap (2-3 pairs), Chiffchaff (2 pairs), Song Thrush (1-2 pair), Great Tit (1 pair), Blue Tit (1-2 pairs) and Reed Bunting (1 pair). Most of these species/ nesting pairs were largely associated with the dense scrub at *Target Notes 38* and *42*. While the Whitethroat was strongly associated with the scattered scrub/ grassland at *Target Note 39* a small number of species were more weakly linked to this habitat type: Dunnock, Blackbird and Reed Bunting.

6.2.40 There are other areas of dense scrub habitat located within the survey site (particularly along the ditch *e.g.* part of *Target Note 38*, and elsewhere *e.g. Target Note 37*) which will not be impacted by the proposed development. However these habitat patches are comparatively small and already support a number of breeding pairs of birds. The proposed landscaping does include areas of scrub planting. Although some of the breeding birds that would be displaced by the proposed development may find alternative nesting locations within the site it is likely that a number would not. Similarly while some of the species of conservation concern would be able to find suitable habitat elsewhere within the site (*e.g.* Reed Bunting)

some would not (*e.g.* 1 or more pairs of Song Thrush). As the scrub habitat is mature this impact should be considered in the long-term; it would take longer than 10 years to establish a similar resource. The magnitude of this impact is therefore considered to be major negative on a resource of district value. The potential impact is therefore likely to be moderate adverse and significant.

6.2.41 Similarly there would be an absolute loss of shelter/ roost opportunities and the feeding resource associated with the scrub. A number of species of bird use the proposed development site outside the breeding season, largely to exploit the various feeding resources. The value of the scrub for these purposes is unknown although food provided by fruiting plants is likely to be of local importance. Although Barn Owl has been observed on the site, the proposed development will only impact part of the potential hunting resource of this species. Seed-eating species may also utilise the areas of grassland/ tall-herbs. It should be noted that similar feeding opportunities will remain available outside the proposed operational area and will develop over time as part of the proposed landscaping. The magnitude of this impact is therefore considered to be intermediate negative on a resource of local value. The potential impact is therefore likely to be slight adverse and not significant.

6.2.42 Due to the location of the proposed operational area, and the size and nature of the proposal, and assuming retention of adjacent areas of scrub, woodland and grassland no particular fragmentation of habitat is envisaged. While some territories may be fragmented as discussed above this impact is associated with absolute habitat loss rather than fragmentation affects.

6.2.43 Noise, activity and visual disturbance may reduce the number of species and the absolute number of birds nesting close to the proposed development site both during the construction and operation phases. Berry (2011) indicates that a number of species of conservation concern are continuing to utilise the Phase I mitigation area despite its proximity to a number of industrial sites and roads. It is therefore considered likely that nesting species will adapt to the remaining available opportunities presented both by the Phase II compensation area and proposed landscaping. The proposed development would be constructed over an approximate 12 month period. However this is a temporary impact and is only likely to affect one breeding season. Different species also vary in their tolerance of such disturbance episodes and many will continue to nest in retained habitat within relatively close proximity to the construction site. It should be noted that the Phase II site is already subject to some inherent level of disturbance due to activities at adjacent premises. The magnitude of this impact is therefore considered to be intermediate negative on a resource of district value. The potential impact is therefore likely to be slight adverse and not significant.

Other Species

6.2.44 Four other species of conservation interest are identified in *Table 15*: Common Frog, Common Toad, Smooth Newt and European Eel. As with Great Crested Newts the (permanent and temporary) loss of terrestrial habitat/ possible reduction in habitat quality (for foraging/ hibernation) will also impact the other local amphibian populations. Potential impacts on the Great Crested Newt population are also likely to be broadly applicable to these three species of amphibian. All three have utilised the ditch (*Target Notes 13* and *18*) for breeding. The magnitude of impact is similarly likely to be major negative on a resource of Wrexham value. The potential impact is likely to be moderate adverse and significant.

6.2.45 As detailed above there may be direct and indirect impacts on the ditch. The potential direct impacts are limited to the construction of the access road and a drainage outflow. This is unlikely to affect the population of European Eel. Potential indirect impacts are associated with releases both during construction and operation. Assuming the installation of an appropriate drainage scheme the magnitude of this impact (during operation) is likely to be neutral on a resource of county value. The potential impact is likely to be neutral and not significant. Accidental releases during the construction phase are only likely to be of a temporary nature. The magnitude of impact is likely to be minor negative. The potential impact is likely to be slight adverse and not significant.

Potential Cumulative Impacts

6.2.46 For the purpose of this assessment the following definition is applicable:

'*Cumulative Impacts: Impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project* (Walker & Johnston 1999)'.

6.2.47 Within this part of the Wrexham Industrial Estate potential cumulative impacts are considered due to the recent development of the (Wrexham Recycling Park) Phase I site and the proposed development of the Phase II site. *Wrexham Unitary Development Plan 1996-2011* also identifies an area of land for Employment (E1) use to the west of the Phase I site on the opposite side of Bridge Road North and a large area of land to the northeast of the Phase I site on the opposite side of Bryn Lane as a Large Single User Employment Site (E3). There is one current planning application[15] that relates to these plots of land and it is therefore deemed appropriate to consider its future ('*reasonably foreseeable*') development in terms of potential cumulative impacts along with the E1 and E3 land detailed above. An application for an Industrial Biomass Facility (Ref. P/2010/0642[16]) has been submitted for a small parcel of land directly to the south of the E3 site mentioned above. The decision on this application is 'pending'.

6.2.48 The Industrial Biomass Facility would be located on a plot of land east of Bryn Lane and directly opposite the vehicular access road to Wrexham Recycling Park. The application site extends to approximately 1.45 hectares that is currently characterised by unmanaged grassland, tall herbs, some shrubs/ trees and hard-standing. The proposed habitat creation and enhancement includes the creation of one pond, several hibernacula and the creation of areas of rough grassland and planted trees; along with long-term management of this habitat (How Planning 2010). Ecological mitigation measures are largely included in Whitcher Wildlife Ltd (2010).

6.2.49 The Phase I and Phase II sites cover a combined total of just over 10.3 hectares with just less than 5 hectares consisting of built development and the remainder being retained/ created habitat and landscaping.

6.2.50 Potential cumulative impacts may include:

- Absolute loss/ modification of habitat;

[15] http://planning.wrexham.gov.uk/Planning/lg/GFPlanningSearchResults.page was interrogated on 16/08/11 at 12.11 pm.
[16] http://planning.wrexham.gov.uk/Planning/lg/GFPlanningDocuments.page was viewed on 16/08/11 at 12.19 pm.

- Fragmentation/ interruption of dispersal routes;
- Increased noise/ disturbance;
- Increased traffic;
- Lighting; and
- Indirect impacts (in particular on water quality).

Within the scope of this assessment it is considered appropriate to address the first two potential impacts listed above while traffic/ noise and lighting are considered more briefly; it would be difficult to quantify the other potential impacts and deal with them in an objective fashion. It should be noted that while the need for consideration of cumulative impacts has been identified in a Screening Opinion provided by WCBC [17]what parameters/ features and extent/ limits should be covered has not.

It should also be noted that while the impacts above were assessed without reference to mitigation/ compensation measures (where these do not form a material part of the proposal) it is considered appropriate to assess cumulative impacts assuming implementation of such measures. For example the Phase I development mitigation/ compensation measures have already been implemented and as such should be considered. Implementation of such measures on the Phase II site and other developments nearby (*e.g.* the Industrial Biomass Facility) are therefore deemed '*reasonably foreseeable actions*'.

Loss/ modification of Habitat

6.2.51 Development of the Phase I site resulted in the loss of nearly 2.4 hectares of unimproved species-rich grassland, tall ruderal vegetation and small patches of scrub. To offset this loss a mitigation area was established that extends to nearly 2.96 hectares. This mitigation area was characterised by relatively species-poor rough grassland, tall ruderal vegetation, patches of scrub, secondary woodland and one pond. Five more ponds were created in this area and long-term management (to benefit in particular Great Crested Newts, birds, butterflies and floral diversity) was secured. In addition to the mitigation area there is a further 1.19 hectares of landscaping within the Phase I site including grassland and shrub planting. Similarly a minimum of 45% of the area of Phase II will be provided as a 'compensation area' and managed in the long-term for the benefit of biodiversity.

6.2.52 Based on the Phase I and Phase II developments it is reasonable to suppose that developments elsewhere on Wrexham Industrial Estate will be required to provide (and secure long-term management of) substantial areas of land for the benefit of biodiversity. The size of this area associated with the proposed Industrial Biomass Facility is not known but appears to be a similar proportion of the overall site. Local Planning Guidance Note (LPG) 29 establishes this concept. It states that '*when 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 '*on-site mitigation* [should] *enhance the nature conservation value of the site and/ or the network of wildlife habitats of which it forms a part*'.

6.2.53 The Phase I and Phase II mitigation/ compensation areas would extend to 4.76 hectares (47602 m^2) of contiguous habitat managed (in the long-term) specifically for the benefit of

[17] SO/2011/010 dated 6th July 2011 and attached letter dated 4th July 2011, addressed to Stratus Environmental Ltd (Ref. JGK/SO/2011/010).

biodiversity including key species such as the Great Crested Newt. Taking the Great Crested Newt as an example the loss of 1.47 hectares of high quality largely immediate terrestrial habitat would be offset by this secured and positively managed area of land. Furthermore these areas have been/ will be enhanced for this species including creation of new ponds and hibernacula. The creation and management of new ponds is particularly important. Many ponds in the wider countryside and indeed the Industrial Estate are in poor condition largely due to habitat loss or degradation. The Phase I mitigation area supported one pond and a stretch of ditch prior to the implementation of enhancement measures. While the ditch supported breeding Great Crested Newts the pond did not. The Phase I mitigation area now supports six ponds (five of which have breeding Great Crested Newts) and the ditch. These mitigation/ compensation areas provide an opportunity to establish a large connected area of terrestrial and aquatic habitat which should support a large and more importantly sustainable population.

6.2.54 Any mitigation/ compensation proposals associated with the land either side of the Wrexham Recycling Park site should further contribute to the area of positively managed habitat (the Industrial Biomass Facility includes for the creation of a pond). Overall while development of these sites would result in absolute loss of terrestrial habitat it would represent a gain in secured, positively managed and enhanced areas of terrestrial/ aquatic habitat. Great Crested Newts that may currently utilise the Phase II site would therefore be able to access additional aquatic habitat. It is the relative lack of high quality aquatic habitat that is considered to have been a limiting factor to the local population in the past (rather than the terrestrial habitat resource). Substantial areas of high quality terrestrial habitat will also remain available. With regard Great Crested Newts the magnitude of this impact is likely to be positive on a resource of national value. The potential impact is likely to be large beneficial and significant. It should be noted that the assessment completed above (with regard Great Crested Newts) considered that the loss of habitat at the site level is likely to result in a significant impact (largely as it is immediate terrestrial habitat to a breeding waterbody).

6.2.55 A similar conclusion could be reached with regard nesting birds although the beneficial impact is likely to take longer to achieve due to the lead-in time required for habitat establishment. It should also be noted that the sites on either side of Wrexham Recycling Park (the Industrial Biomass Facility includes for areas of tree planting) are likely to have opportunities for achieving significant gains in nesting bird habitat. This is because the site to the west is characterised by amenity grassland and relatively young shrub/ tree planting while that to the east is predominantly agricultural fields. As such large parts of these sites are currently of little inherent value for nesting birds. However due to the lead-in time required and combined area of scrub habitat that would be lost from the Phase I and II sites the magnitude of impact (on nesting birds) must be considered to be major negative. The potential cumulative impact may be moderate adverse and significant.

Habitat Fragmentation/ Interruption of Dispersal Routes

6.2.56 The Phase I site, characterised by buildings and hard-standing is located to the west and north of the Phase II site. At present there are areas of formally managed landscaped land and other industrial premises to the west of the Phase I site. To the north there is a further area of landscaped ground with semi-mature trees bordering the northern boundary of the Phase I mitigation area. To the east of Bryn Lane there are landscaped grounds and further

industrial premises and disused plots that back on to open farmland. Due to the landuse within the Industrial Estate habitat patches are often highly fragmented and frequently subject to varying levels of physical disturbance.

6.2.57 The development (Phase I and Phase II) may present a barrier to movement of various species from or across the site to areas of habitat to the west or vice versa to the east. For example, the pond within Isringhausen land 40 m to the west of the Phase I site supports a small breeding population of Great Crested Newts. Any individuals that may currently traverse across the site to reach the pond or utilise the site as terrestrial habitat may be prevented from doing so both during the construction phase and operation phase. However this pond is already fairly isolated on the opposite side of Bridge Road North. This road incorporates gulley-pots that are likely to trap amphibians. As such it is considered unlikely that many amphibians (from this pond) access the Phase I and Phase II sites. Furthermore amphibians that currently utilise the ditch (located between the Phase I and II sites) are considered more likely to disperse to the north and east where there are more waterbodies and high quality terrestrial habitat. Development of the Phase II site is unlikely to greatly increase fragmentation: retained habitat would be directly linked to other nearby habitat patches.

6.2.58 Similarly bats that currently utilise the Phase II site are unlikely to be affected by the proposed development. Pipistrelles are relatively tolerant of changes to their flight-lines and are able to traverse areas of unsuitable habitat. They would still be able to forage/ commute along the ditch and as stated previously the areas of retained suitable habitat would all be linked to other suitable areas of habitat outside the Phase II site. The magnitude of this impact is therefore likely to be minor negative. The potential impact is likely to be slight adverse (at most) and not significant.

Noise/ traffic

6.2.59 Bryn Lane and Bridge Road (North) carry a significant amount of industrial traffic, including heavy goods vehicle movements, given they are within an Industrial Estate (see transport chapter of ES). The Noise chapter within the ES concludes that there will be no significant impacts as a result of the construction and operation phases or due to potential cumulative impacts. Further information is provided in this chapter. It is unlikely that general levels of noise, disturbance and wildlife mortality will increase greatly as a result of site operation. The magnitude of this impact is likely to be minor negative. The potential impact is likely to be slight adverse at most and not significant.

Lighting

6.2.60 There are a number of existing premises on all sides of the proposed development site that are currently operated through the night and have high levels of associated external lighting. Any potential impacts on the surrounding ecological resource are unlikely to be markedly greater when the proposed development is operational. Due to the limited spatial extent of this impact, limited hours of operation, limited number of lights and the existing light sources in the surrounding area and the fact that much of the current ecological resource is thriving on an Industrial Estate the magnitude of impact is likely to be minor negative. The potential impact is likely to be slight adverse at most and not significant.

6.3 Mitigation and Reasonable Avoidance Measures

Introduction

6.3.1 This section briefly outlines measures required to mitigate for all adverse impacts identified in the previous section and where there is potential to impact legally protected species. Further detail regarding mitigation and compensation measures will be provided in a Method Statement and separate Management Plan. It is expected that production of this Method Statement and Management Plan would be conditioned as part of any planning permission. This approach has been discussed with Wrexham County Borough Council.

6.3.2 The Method Statement and Management Plan would also detail a programme of monitoring of the created/ retained habitat and other (species-specific) mitigation/ compensation measures. Monitoring will review the success of these measures and identify where such provisions may need to be altered. The Management Plan prescribes management of these areas that will be undertaken to benefit the ecological resource of the site, in particular Badger, bats, birds, Great Crested Newts and certain habitat types. Although there is habitat loss in absolute area there will be a net gain in (enhanced) habitat quality under positive management.

6.3.3 No direct or indirect impacts on statutory protected sites have been identified. Adverse indirect impacts on the County Wildlife Site may result due to dust deposition during both construction and operation, and release of other pollutants. Appropriate mitigation measures are included in the Remediation Strategy and the Air Quality chapter in the ES.

General

6.3.4 Generic measures to mitigate potential impacts on ecological resources are as follows:

- where there is potential for impact on protected species, mitigation measures will be designed to ensure compliance with the law and licensing procedures;
- where possible, measures will be taken to minimise adverse impacts on other species (and if necessary, agreed with the appropriate regulatory authority);
- where possible, potential impacts will be avoided through seasonal timing of work, *e.g.* avoiding vegetation clearance during the bird nesting season;
- through implementation of best practice, disturbance to wildlife will be minimised as much as possible. In addition, routine site practices will be implemented to control dust, spillages, releases to watercourses, vibration and noise;
- compliance and site awareness will be ensured through the provision of toolbox talks/ method statements to all site personnel as required;
- compliance with the mitigation measures will be ensured through monitoring and auditing; and
- (if deemed necessary) pre-construction surveys will be undertaken to provide up-to-date data to inform mitigation measures.

Habitat

6.3.5 The impact assessment has identified one significant potential impact on habitats associated with the proposed development:

- (Permanent) loss of 0.54 hectares of mature scrub/ scrub-woodland at *Target Note 42*.

6.3.6 A compensation area is to be provided towards the eastern side of the site which extends to approximately 1.8 hectares. All existing scrub within this area will be retained and further planting is proposed (approximately 0.42 hectares: 4185 m^2). Scrub planting will also be undertaken within the proposed landscaping area (approximately 0.099 hectares: 986 m^2). The scrub within the operational area will provide a potential link between the retained woodland at *Target Note 44* and the scrub in the compensation area. Approximately 0.84 hectares of dense scrub are to be lost due to the proposal which would be offset by the planting of just over 0.517 hectares of new scrub along with translocation of mature specimens (further discussed below). A similar suite of woody species to that which characterises the current resource would be utilised (see 'Landscaping Proposals' plan); these should ideally be of local, or at least British, provenance.

6.3.7 The following guiding principles should be adhered to within any proposed landscaping scheme:

- All trees, shrubs and seed-mixes should be of ideally locally native provenance but as a minimum certified British native origin.
- Grass seed-mixes should be from an appropriate source, *e.g.* British Seed Houses' 'UK Native Wild Flora Mixtures'[18] and appropriate to the habitat/ conditions.
- Appropriate native tree species include: *Fraxinus excelsior* (Ash), *Quercus robur* (Pedunculate Oak), *Betula pendula* (Silver Birch) and perhaps *Alnus glutinosa* (Alder) in damp ground.
- Appropriate native shrub species include: *Corylus avellana* (Hazel), *Crataegus monogyna* (Hawthorn), *Prunus spinosa* (Blackthorn), *Ilex aquifolium* (Holly), *Rosa canina* agg. (Dog-rose), *Salix caprea* (Goat Willow), *Salix cinerea* (Grey Willow) and *Sambucus nigra* (Elder).
- The shrubs/ trees should be planted employing a variable spacing (although a guide is 2 m spacing).

6.3.8 In addition to this planting it is also proposed to translocate some of the semi-mature/ mature Hawthorn shrubs from within the proposed development footprint to the compensation/ landscaping area. These would largely be planted in a group to re-create the dense scrub conditions currently provided as far as is reasonably possible. It is likely that where shrubs are below 0.2 m dbh they would be heavily pruned to reduce stress and then excavated with a large tracked excavator with a deep digging bucket (*e.g.* Anderson, 2003). Approximately 20-30 Hawthorns will be translocated. The exact method and timing will be detailed in an Ecological Mitigation Method Statement. Consideration would also need to be given to appropriate on-going (long-term) management of the scrub. During the establishment phase after translocation these shrubs will need to be regularly watered throughout the growing season for 2-3 years and mulched after planting.

6.3.9 The ecological compensation area/ other retained habitat will be identified and fenced prior to the start of construction works to avoid accidental damage. Appropriate signage, toolbox talks and the Method Statement will be utilised to prevent accidental ingress into this area as required. This will also help to minimise potential disturbance impacts. Appropriate best practice provisions should be established to limit the transfer of dust *etc* onto immediately adjacent habitats. Fencing and signage will remain in place for the duration of construction works.

[18] http://www.bshamenity.com/files/Wildflower-brochure.pdf

6.3.10 The impact assessment has identified potential (not significant) impacts on the following habitats:

- Semi-mature/ mature scrub (*Target Note 38*).
- Unimproved neutral grassland/ scattered scrub (*Target Note 39*).
- Short stretch of the ditch (*Target Note 13*).
- Ephemeral waterbody (*Target Note 45*).
- Amenity grassland by the HRC.

6.3.11 Approximately 0.29 hectares of semi-mature/ mature scrub will be lost (excluding that at *Target Note 42*). Compensation for loss of scrub habitat is detailed above.

6.3.12 Approximately 1.32 hectares of grassland/ scattered scrub will be lost. The proposed compensation area will be managed for the benefit of a range of species/ habitats. The compensation area includes a large part of the Wrexham Industrial Estate County Wildlife Site at Bryn Lane. 'Species-rich grassland' is noted as a feature of this non-statutory protected site. It is likely over time that the resource within the Wildlife Site will be degraded without active management. It is likely that open areas of grassland will succeed to comparatively species-poor rank grassland and or scrub; this process is already evident. By including this grassland within the compensation area long-term management will be secured for 1.8 hectares and it is likely that this grassland will be enhanced. Although there is habitat loss in absolute area there will be a net gain in habitat under positive management.

6.3.13 A further 0.45 hectares (4461 m^2) of species-rich grassland will also be sown within the landscaping area. This provides an opportunity for net biodiversity gain associated with the development; the potential for species-rich neutral grassland to be established to take account of locally (Wrexham Industrial Estate) distinctive plant species. Design of this grassland habitat has taken full account of the potential use by protected species (for example as a foraging resource for bats and a foraging/ hibernation resource for Great Crested Newts). It may also be appropriate to create/ manage grassland habitat that may be suitable for colonisation by Dingy Skipper (*Erynnis tages*) and Grizzled Skipper (*Pyrgus malvae*). Both these butterfly species have restricted distributions but are distinctive features of the Wrexham Industrial Estate.

6.3.14 A short stretch of the ditch at *Target Note 13* will be impacted when the site access road is created. The ditch channel will be reinstated following completion of the construction; the flow would not be inhibited. The ditch would be protected (from indirect impacts) during the construction phase through implementation of best practice. Measures to protect the ditch from sediment release, sediment run-off, pollution by fuel and oil and other accidental spillage's during construction are provided in the Remediation Strategy. In addition, the general advice contained in the Pollution Prevention Guidance (PPG) leaflets produced by SEPA, EA and the Environment and Heritage Service (Northern Ireland) will be adhered to, particularly the following:

- PPG1: General Guide to the Prevention of Pollution.
- PPG5: Works in, Near or Liable to Affect Watercourses.
- PPG6: Working at Demolition and Construction Sites.
- PPG7: Refuelling Facilities.

As well as:

SEPA (2009). *Engineering in the Water Environment Good Practice Guide: Temporary Construction Methods.* First Edition, March 2009 (WAT-SG-29).

Flora

6.3.15 The impact assessment has not identified any significant impacts related to flora. As noted in *Section 6.2* while one (possibly two) locally scarce plant species may be lost from the site and parts of the populations of other species may also be affected nearly all of the locally scarce species recorded from the site would be retained within the compensation area. Furthermore positive long-term management of this area is likely to benefit several of these species. Some of the grassland within the compensation area will be managed to benefit species richness; this will be detailed further in the Management Plan. Areas of habitat creation/ landscaping will also present further opportunities for colonisation.

Fauna

Bats

6.3.16 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*. 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)*. Protection was extended by the *Countryside and Rights of Way Act 2000* (the *CRoW Act*).

6.3.17 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.

6.3.18 Several species of bat are included as Priority Species in the UK Biodiversity Action Plan (UK BAP: UK Biodiversity Steering Group 1995, 1998a & b) and also as species of principal importance for the conservation of biological diversity in Wales under *Section 42* of the *NERC Act 2006*.

6.3.19 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.

6.3.20 The impact assessment has not identified any significant potential impacts (on bats). Impacts that have been assessed as slight adverse but not significant include the loss of scrub at *Target Notes 38* and *42* that may be utilised for foraging/ commuting by Pipistrelle bats, the potential disturbance of roosts adjacent to the development site (no roosts are currently known) and the potential impact of external lighting.

6.3.21 Pipistrelle bats would continue to be able to forage/ commute along the ditch corridor and the eastern side of the site as the latter would be within the compensation area. The habitat

both within the compensation area and the proposed landscaping is directly linked with the ditch. Once established, any compensatory provision of scrub habitat (as outlined in *paragraph 6.3.6* above) will provide potential features for foraging/ commuting Pipistrelle bats to utilise. The woodland at *Target Note 44* is to be retained and this is directly linked with an area of scrub/ woodland outside the southwest site boundary. This may provide a new edge habitat (along the southwest site boundary) along which bats could commute/ forage. The establishment of species-rich grassland in the proposed landscaping as well as the habitat provided by the attenuation lagoon may establish an enhanced potential foraging resource for bats. As detailed above the overall ecological compensation and landscape planting scheme will provide new lines of trees/ shrubs across the site.

6.3.22 The proposed development site is located in close proximity to a small number of trees (in the adjacent woodland at *Target Note 44*) with low potential value for roosting bats. Appropriate measures will be implemented to reduce or avoid any potential disturbance. Works involving heavy machinery will be minimised wherever possible within the vicinity of trees and works close to trees will not be undertaken during the main bat breeding season (June to end of July). A small number of trees within this woodland will be felled but none provide potential value for roosting bats.

6.3.23 There is currently no detailed design for external lighting available. Lighting at the proposed development site should follow guidance provided by the Bat Conservation Trust and Institution of Lighting Engineers (2008). Identified flight-lines and other potential foraging habitat (the ditch corridor, woodland at *Target Note 44*, compensation and landscaping areas) should be retained in darkness wherever possible. Where possible, all external lighting will use low pressure sodium lamps or similar and where close to potential foraging habitat will be fitted with baffles and point straight down 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 buildings/ poles. Of particular importance is the avoidance of light spillage onto the ditch corridor and compensation area. Any street lighting along the access road should be sympathetically designed in accordance with this guidance.

Great Crested Newts

6.3.24 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.

6.3.25 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.

6.3.26 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.

6.3.27 The impact assessment has identified the following significant impacts on Great Crested Newts due to the proposed development:

- Loss of high value terrestrial habitat.
- Accidental capture in drainage features.

6.3.28 Other impacts on Great Crested Newts (though not considered to be significant) include modification of a short stretch of ditch, temporary loss/ modification of terrestrial habitat and fragmentation/ disturbance.

6.3.29 As detailed above approximately 1.47 hectares of high value terrestrial habitat will be lost due to the proposed development. To offset this loss a compensation area is to be provided that extends to approximately 1.8 hectares. It will provide habitat for Great Crested Newts during both their terrestrial and aquatic phases, and throughout the year. Initially the habitat will be enhanced through the provision of three new ponds. In addition two hibernacula will be provided. Areas of rough grassland will be managed through limited intervention, with scrub managed on a long-term rotation. Further detail will be provided in the proposed Ecological Mitigation Method Statement and the Management Plan. The Management Plan would cover a 25-year period. Terrestrial habitat management will produce a mosaic of patches of scrub of varying age and grassland at varying heights. The proposed ecological compensation area will maintain some connectivity between the ditch corridor, the Phase I mitigation area and land parcels to the north and south.

6.3.30 Initial management of the new ponds will aim to provide suitable conditions for Great Crested Newts to breed. In the first few years this may include provision of egg-laying strips; no planting is proposed. Subsequent management of the ponds will be on medium-term rotation and will seek to maintain a diverse marginal and aquatic flora with areas of open water. This will increase the number of Great Crested Newts using the site, and therefore provide a stabilised source to strengthen the local meta-population. The approximate location of these ponds is provided on the 'Landscaping Proposals' plan although they are not shown to scale. A detailed design for these ponds will be provided in the Ecological Mitigation Method Statement.

6.3.31 Scrub and grassland to be planted within the proposed operational area (extending to approximately 0.73 hectares: 7332 m^2) would also remain available for Great Crested Newts.

This landscaping includes the surface water attenuation lagoon (approximately 0.15 hectares: 1528 m^2) that will also provide potential habitat for this species.

6.3.32 All surface water drainage will be directed into the proposed attenuation lagoon which would have a restricted outfall to the ditch at *Target Note 13*. No detail is currently available regarding the drainage arrangement but it should incorporate features that are 'newt-friendly'. Wherever possible the use of gulley-pots and or beany kerb-stones would be avoided. If gulley-pots are utilised they would be combined with a 'wildlife kerb' system[19]. It is assumed that the requirement to incorporate such features into the drainage scheme would be attached as a condition should planning permission be provided.

6.3.33 The terrestrial habitat within the development site is considered to be of high potential value for Great Crested Newts; Great Crested Newts are known to utilise the site. As there is therefore a (high) risk of disturbing/ killing individual Great Crested Newts during the construction phase, a 'development' licence will be required from the Welsh Assembly Government (WAG) in order for the scheme to legally proceed. The associated licence application will need to consider in detail maintenance of the Favourable Conservation Status (FCS) of the species in this area both during and after the construction phase. Mitigation that is likely to be required would include the following:

- Subject to granting of the WAG licence; translocation of Great Crested Newts from the development site footprint ahead of any preparatory or construction works. This is likely to require fencing of the development site (and any associated storage areas/ access routes, *etc*) with temporary amphibian exclusion fencing and subsequently a minimum trapping period of 30 days in suitable weather conditions. All amphibians would be translocated to a suitable receptor site, likely to be the compensation area;
- Long-term management (with appropriate funding mechanism) of any created/ retained habitats within the compensation area. This management would be undertaken by a suitable third party nature conservation organisation with experience of managing such sites;
- Long-term security of the compensation area through appropriate land charge/ land transfer/ leasehold/ other mechanism if applicable;
- Monitoring of the translocated population;
- Provision of a plan to CCW showing the boundary of the proposed compensation area on a suitable GIS package;
- An independent compliance audit scheme for the proposed mitigation package; and
- A biosecurity risk assessment that considers both the construction and operation phases.

6.3.34 *Article 1 (i)* of the Habitats Directive defines the 'conservation status' of a species as:

"*the sum of the influences acting on the species concerned that may affect the long-term distribution and abundance of its population within the territory*".

6.3.35 The conservation status will be taken as favourable when:

- "*population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats, and*

[19] E.g. http://www.aco.co.uk/product_detail.php?id=52

- *the natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and*
- *there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis*".

6.3.36 FCS is notoriously difficult to define (*e.g.* ARC & Cofnod 2010) particularly when current status is not known (as is the case at the proposed development site). However as indicated in *Section 6.2* it is believed that availability of suitable aquatic habitat is more likely to be a limiting factor to the local population (than availability of terrestrial habitat). While there would be an absolute loss of 1.47 hectares of potential terrestrial habitat associated with the Phase II proposal 1.8 hectares of terrestrial habitat will be secured with positive management in the long-term. Furthermore the creation of three new ponds would increase the availability of high quality aquatic habitat in this area and therefore its capacity to support a larger breeding population. In combination with the Phase I mitigation area this will provide a total of 4.76 hectares of positively managed terrestrial habitat along with nine ponds in an area of at least national importance for this species. While it is unlikely that the FCS of the local population is currently being maintained due to a range of factors beyond the control of the applicant the above detailed compensation area could only be viewed as a positive contribution to the conservation status of this species in the area.

6.3.37 While the FCS for the local population cannot be defined there is some information available on current condition based on two years of survey data. Therefore the FCS (in terms of population size alone) could be considered to be a strong medium population. Following translocation from the Phase I development site the associated mitigation area now supports a medium population. As such in terms of population size this could be considered to have maintained the FCS. Based on the proposed mitigation/ compensation package it is considered likely that Phase II would result in a similar outcome.

Birds

6.3.38 All species of bird are protected under *Section 1* of the *Wildlife and Countryside Act 1981* (as amended). The protection was extended by the *CRoW Act*. 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.

6.3.39 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.

6.3.40 The impact assessment has identified the following significant impact on birds due to the proposed development:

- Loss of nesting habitat: scrub at *Target Note 42* and grassland/ scattered scrub at *Target Note 39*.

6.3.41 Other impacts on birds (though not considered to be significant) include loss of shelter/ roosting opportunities and feeding resources, and disturbance during the construction phase.

6.3.42 As detailed above the proposed compensation area and landscaping includes for planting of 0.517 hectares of scrub. Furthermore due to the length of time involved before a similar habitat would replace that to be lost it is proposed to translocate some of the mature Hawthorn shrubs from the proposed development footprint to the landscaping area. Translocation of mature specimens should provide similar nesting opportunities within the short-term and provide structure to the proposed planting. Any proposed compensatory scrub planting should be designed to provide a range of nesting opportunities for birds. A selection of nest-boxes should also be provided (and maintained) to compensate for the short-term loss of nest-sites. These nest-boxes should target key species such as the Song Thrush. Most of the breeding birds recorded within the site can be considered ubiquitous scrub-nesters and are likely to find nesting opportunities in the proposed compensation area or other retained/created habitat around the site. In addition the three new ponds in the proposed compensation area may favour species that utilise wetland habitat such as the Reed Bunting.

6.3.43 As detailed above the compensation area and retained habitat will be fenced throughout the construction phase. This will avoid the potential for accidental damage during the construction phase. The fencing will be reinforced with appropriate signage and toolbox talks as required. Further detail will be provided in the Ecological Mitigation Method Statement. The fencing should also help to minimise potential disturbance of nesting birds in areas adjacent to the construction zone.

6.3.44 The destruction of any bird nests that are in use is illegal. Measures will be taken to minimise the likelihood of disturbance, injury or mortality of nesting birds, their eggs and chicks. Where possible, potential impacts during physical works will be avoided through seasonal timing of work (outwith March-August inclusive). Wherever possible, vegetation that could be used by nesting birds will be removed outside the bird nesting season.

6.3.45 Should this not be possible, surveys will be undertaken immediately prior to habitat removal to confirm that there are no occupied nests. Should any occupied nests be identified, an appropriate buffer zone (determined on the basis of the species concerned and the location of the nest in the context of the surrounding vegetation, but no less than 5m) will be retained until it can be ascertained that the chicks have left the nest. The buffer zone will be appropriately fenced and signed.

Reptiles

6.3.46 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.

6.3.47 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.

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

6.3.49 Although no reptiles have been recorded on the proposed development site it is possible that Grass Snake could hunt along the ditch that is located along the north/ west boundary of the proposed development site. As such a precautionary approach is advocated. A simple watching brief/ appropriate working protocol would ensure that suitable habitat is checked for reptiles prior to the clearance works in that area. The working protocol should also detail actions that should be taken if any reptiles are found during the construction phase. Any reptiles found during the Great Crested Newt translocation would also be moved out of the development site. Herptile exclusion fencing will be maintained around the site during the construction phase.

Other Species

6.3.50 Other amphibians recorded from the site (Common Frog, Common Toad and Smooth Newt) are likely to be mitigated for in conjunction with Great Crested Newts. No particular impacts on European Eel are envisaged assuming appropriate mitigation measures for potential indirect and direct impacts on the ditch (see above).

Cumulative Impacts

6.3.51 The mitigation/ compensation measures detailed above are also applicable to the identified cumulative impacts. As such they are not discussed here but are detailed in *Section 6.4* below before being re-assessed.

6.4 Residual Impacts

Ecological resource	Potential impact(s)	Mitigation	Residual impact
Habitat			
Loss of mature scrub/ scrub woodland (*Target Note 42*).	Moderate adverse and significant.	Provision, and appropriate (long-term) management of retained and planted scrub. Translocation of some mature individual Hawthorns. Compensation area/ retained habitat to be fenced throughout construction.	Slight adverse (and not significant) in the medium-term. Neutral in the long-term.
Loss of semi-mature/ mature scrub (*Target Note 38*).	Slight adverse and not significant.	As above.	As above.
Loss of unimproved neutral grassland/ scattered scrub (*Target Note 39*).	Slight adverse and not significant.	Provision, and appropriate (long-term) management of retained and sown grassland. Positive management/ enhancement of County Wildlife Site.	Slight adverse (and not significant) in the medium-term. Neutral/ possible moderate beneficial in the long-term.
Modification of short stretch of ditch (*Target Note 13*)	Slight adverse and not significant.	Provision of temporary fencing and appropriate signage throughout the duration of the scheme. Contractors will be notified of the importance of not impinging on these areas in tool-box talks. Protection of ditch at *Target Note 13* through implementation of best practice. Reinstatement of ditch following construction of site access road.	Neutral in the medium-term.
Loss of parts of populations of ten locally scarce plants	Slight adverse and not significant.	Provision, and appropriate (long-term) management of retained and sown grassland. Retention of woodland at *Target Note 44* and much of the ditch corridor.	Neutral.

Ecological resource	Potential impact(s)	Mitigation	Residual impact
Immediately adjacent habitat.	Slight adverse and not significant.	Implementation of appropriate best practice provisions to prevent in-direct impacts *e.g.* control of dust. Provision of temporary fencing and appropriate signage throughout the duration of the scheme. Contractors will be notified of the importance of not impinging on these areas in tool-box talks as required. Protection of ditch at *Target Note 13* through implementation of best practice.	Neutral.
Bats			
Pipistrelle bat foraging/ commuting. Disturbance during work.	Slight adverse and not significant.	Provision of scrub habitat may provide alternative commuting routes once established. Provision of species-rich grassland in landscaping may provide enhanced foraging resource. Retention of ditch corridor. Working protocol for works near to foraging/ potential roost sites.	Neutral in medium-term.
Lighting during operation.	Slight adverse and not significant.	Appropriate external lighting to be designed in accordance with best practice.	Neutral.
Great Crested Newts			
Modification of short stretch of ditch (*Target Notes 13* and *18*).	Slight adverse and not significant.	Licensed translocation ahead of works. Reinstatement of ditch following construction of site access road.	Neutral in short-term.
Indirect impacts on ditch (*Target Notes 13* and *18*) during construction.	Slight adverse and not significant.	Protection of ditch at *Target Note 13* through implementation of best practice. Flood attenuation lagoon constructed as part of surface water management system.	Neutral in short-term.

Ecological resource	Potential impact(s)	Mitigation	Residual impact
Loss of high value terrestrial habitat	Large adverse and significant.	Implementation of a licensed translocation scheme to prevent impacts on individual newts. Provision of compensation area – site security, long-term management and monitoring. Creation of new habitat (scrub, ponds, hibernacula). Creation of pond cluster to strengthen local meta-population. Enhancement of existing habitat.	Neutral. Potentially positive (large beneficial) in medium to long-term.
(Temporary) loss/ modification of terrestrial habitat plus, fragmentation and disturbance. Disturbance during work.	Slight adverse and not significant.	Licensed translocation. Compensation area/ retained habitat to be fenced throughout construction.	Neutral.
Drainage features (accidental capture during operation)	Large adverse and significant.	Appropriate 'newt-friendly' design of drainage features.	Slight adverse in short to medium-term. Neutral in long-term.
Birds			
Loss of mature scrub/ scrub woodland (*Target Notes 38* and *42*) and unimproved neutral grassland/ scattered scrub (*Target Note 39*). Associated nesting/ feeding/ roosting, *etc* opportunities.	Moderate adverse and significant.	Provision, and appropriate (long-term) management of retained and planted scrub. Translocation of some mature individual Hawthorns. Compensation area/ retained habitat to be fenced throughout construction. Provision of a small number of nest-boxes. Where possible, potential impacts during physical works will be avoided through seasonal timing of work. Scrub and vegetation cleared prior to breeding season. Avoidance measures during construction.	Slight adverse (and not significant) in the medium-term. Neutral in the long-term.
Loss of shelter/ roost opportunities/ feeding resource.	Slight adverse and not significant.	Provision, and appropriate (long-term) management of retained and planted scrub.	Neutral.

Ecological resource	Potential impact(s)	Mitigation	Residual impact
		Retention of ditch corridor.	
Disturbance during work.	Slight adverse and not significant.	Compensation area/ retained habitat to be fenced throughout construction. Signage to be erected on fence and toolbox talks provided as required.	Neutral.
Amphibians (Common Frog, Common Toad, Smooth Newt)			
Temporary and permanent loss of terrestrial habitat.	Moderate adverse and significant.	Translocation of all amphibians from the site. Provision of compensation area – site security, long-term management and monitoring. Creation of new habitat (scrub, ponds, hibernacula). Enhancement of existing habitat.	Neutral. Potentially positive (moderate beneficial) in medium to long-term.
European Eel			
Direct and indirect impacts on ditch.	Slight adverse and not significant.	Protection of ditch at *Target Note 13* through implementation of best practice. Flood attenuation lagoon constructed as part of surface water management system.	Neutral in short-term.
Cumulative Impacts			
Loss of scrub (bird nesting).	Moderate adverse and significant.	Provision, and appropriate (long-term) management of retained and planted scrub. Translocation of some mature individual Hawthorns. Compensation area provides link with other nearby habitat patches.	Slight adverse (and not significant) in the medium-term. Neutral in the long-term.
Habitat fragmentation/ interruption of dispersal routes.	Slight adverse and not significant.	Provision and long-term management of compensation area which is linked to other habitat patches. Creation of new habitats.	Neutral.

Ecological resource	Potential impact(s)	Mitigation	Residual impact
		Retention of ditch corridor.	
Noise/ traffic.	Slight adverse and not significant.	Mitigation/ avoidance measures provided in the relevant chapter of the ES.	Neutral.
Lighting.	Slight adverse and not significant.	Appropriate external lighting to be designed in accordance with best practice.	Neutral.

6.5 Conclusions

6.5.1 The impact assessment identified six adverse impacts considered to be significant should the proposed development be constructed without appropriate mitigation/ compensation measures. Potential impacts on Badgers are covered by a separate confidential annex (Marches Ecology 2011b). Significant impacts are identified as follows:

- Loss of mature scrub/ scrub woodland (*Target Note 42*).
- Loss of high value terrestrial habitat for Great Crested Newts.
- Accidental capture of Great Crested Newts (by poorly designed drainage features).
- Loss of bird nesting opportunities associated with scrub/ grassland (*Target Notes 38, 39* and *42*).
- Loss of high value terrestrial habitat for other amphibian populations.
- Cumulative impact due to loss of bird nesting opportunities associated with scrub.

6.5.2 A number of adverse impacts were assessed as not significant. *Section 6.3* of this document outlines measures proposed to address these possible impacts as well as those assessed as being less significant. Assuming the implementation of all proposed mitigation/ compensation measures the residual impacts of the proposed development have largely been assessed as slight adverse (in the medium-term) or neutral/ positive. Further detail on all mitigation/ compensation measures, long-term management of compensatory/ retained habitat and monitoring of habitats/ species will be provided in an Ecological Mitigation Method Statement and a Management Plan.

6.5.3 The impact assessment identified two beneficial impacts. These are the secured long-term management of the Wildlife Site and enhancement/ long-term management of the compensation area for the local Great Crested Newt population.

7 TARGET NOTES

Target notes in this report largely utilise the original numbers generated for the 2007 survey.

Target Note 7. Semi-natural broad-leaved woodland (immediately adjacent to the site). Not recorded in detail.

Target Note 8. Dense scrub (immediately adjacent to the site). It is dominated by mature *Crataegus monogyna* (Hawthorn) with locally frequent *Salix cinerea* (Grey Willow); occasional *Acer pseudoplatanus* (Sycamore) also occurs. *Rubus fruticosus* agg. (Bramble) frequently forms dense low-growing stands. Other shrubs recorded include occasional *Sambucus nigra* (Elder) and *Rosa canina* agg. (Dog-rose). The associated field layer is generally bare or dominated by *Urtica dioica* (Common Nettle). This merges with woodland recorded at *Target Note 44.* Narrow margins of species-rich neutral grassland are located on the edge of this scrub outside the site (and the woodland described at *Target Note 44*), this was not recorded in detail.

Target Note 13. A wide ditch that bisects the site, flowing roughly southeast to northwest. The flow is imperceptible. The water is approximately 2 to 2.5 m wide and up to 0.4 m deep at this point. The channel from water level to bank top is approximately 1.5 to 2 m deep and 4 m wide between the bank-tops. The sides of the channel are steeply sloping (45-60°) and have a uniformly engineered profile. Marginal vegetation is mostly dominated by the grass *Agrostis stolonifera* (Creeping Bent) but includes locally frequent *Juncus inflexus* (Hard Rush), occasional *Carex otrubae* (False Fox-sedge), *Deschampsia cespitosa* (Tufted Hair-grass) and *Phalaris arundinacea* (Reed Canary-grass). Channel vegetation includes occasional stands of *Typha latifolia* (Bulrush), locally frequent *Callitriche stagnalis* (Common Water-starwort) (especially in deeper sections) and *Iris pseudacorus* (Yellow Iris), and lesser amounts of *Alisma Plantago-aquatica* (Water-plantain) and *Ranunculus sceleratus* (Celery-leaved Buttercup). A filamentous alga is locally abundant throughout. The floating leaved plants *Potamogeton natans (*Broad-leaved Pondweed), *Lemna minor* (Common Duckweed) and *Lemna trisulca* (Ivy-leaved Duckweed) also occur in variable levels of abundance.

The banks are mostly covered in dense scrub of *Crataegus monogyna* (Hawthorn), *Rubus fruticosus* agg. (Bramble), *Rosa canina* agg. (Dog-rose) and young trees (including *Salix caprea* (Goat Willow) and young *Betula pendula* (Silver Birch)) which occasionally over-hangs the channel. Dense scrub on the eastern bank is described in *Target Note 38.* Along short stretches of bank where it is more open there are patches of sparse species-rich grassland similar to that described in *Target Note 1*, with the addition of frequent *Filipendula ulmaria* (Meadowsweet). Some of these areas are south-facing and so consequently may be of value for invertebrates.

Common Frog (*Rana temporaria*) and Common Toad (*Bufo bufo*) spawn was noted in the ditch. The ditch provides habitat that is of potential value for Great Crested Newts (*Triturus cristatus*) and Water Vole (*Arvicola terrestris*) although cover for the latter is limited in some areas.

Target Note 18. The ditch at this point is heavily silted and dominated by stands of *Iris pseudacorus* (Yellow Iris). The channel dimensions are similar to that described in *Target Note 13* but the water is approximately 0.15 m deep. Common Frog (*Rana temporaria*) spawn is frequent (noted in 2007).

Target Note 33. Species-rich unimproved neutral grassland. The sward is of a variable structure and comprises a variety of grasses including *Arrhenatherum elatius* (False Oat-grass), *Cynosurus cristatus* (Crested Dog's-tail), *Deschampsia cespitosa* (Tufted Hair-grass), *Dactylis glomerata* (Cock's-foot), *Holcus lanatus* (Yorkshire-fog), *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue) and *Phalaris arundinacea* (Reed Canary-grass). A range of herbs and forbs are scattered throughout such as *Centaurea nigra* (Common Knapweed), *Achillea millefolium* (Yarrow), *Geranium dissectum (*Cut-leaved Crane's-bill), *Trifolium repens* (White Clover), *Senecio jacobaea* (Common Ragwort), *Bellis perennis* (Daisy), *Leucanthemum vulgare* (Oxeye Daisy), *Cerastium fontanum* (Common Mouse-ear) *and Daucus carota* (Wild Carrot). Locally tall-ruderal vegetation comprising *Epilobium hirsutum* (Great Willowherb) and *Urtica dioica* (Common Nettle) occurs. This area constitutes potential high-quality reptile habitat.

Target Note 34. Species-poor unimproved neutral grassland although it is comparatively species-rich in small patches. Where more species-rich species such as *Leucanthemum vulgare* (Oxeye Daisy), *Lathyris pratensis* (Meadow Vetchling) and *Carex nigra* (Common Sedge) are more prevalent. It comprises rough grassland with a tussocky, rank structure. The coarse-leaved grasses *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Elytrigia repens* (Common Couch) are co-dominant with other grasses present including *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue), *Phalaris arundinacea* (Reed Canary-grass) and *Deschampsia cespitosa* (Tufted Hair-grass). *Juncus inflexus* (Hard Rush) occasionally occurs. Tall-herbs and lower growing forbs are scattered throughout at low levels of abundance. These include *Anthriscus sylvestris* (Cow Parsley), *Heracleum sphondylium* (Hogweed), *Centaurea nigra* (Common Knapweed), *Cardamine pratensis* (Cuckooflower), *Cirsium arvense* (Creeping Thistle), *Galium aparine* (Cleavers), *Rumex acetosa* (Common Sorrel), *Potentilla reptans* (Creeping Cinquefoil), *Rumex obtusifolius* (Broad-leaved Dock), *Urtica dioica* (Common Nettle), *Vicia sativa* (Common Vetch) and *Vicia hirsuta* (Hairy Tare). This area constitutes potential reptile habitat, although not of high quality.

Target Note 35. Six semi-mature planted *Populus* spp. (Poplar) trees with an approximate dbh of 0.25 m. No features of potential value for roosting bats are visible

Target Note 36. A complex mosaic of young planted trees and low-growing *Rubus fruticosus* agg. (Bramble) scrub with associated species-poor unimproved neutral grassland. The grassland has a tussocky, rank structure. The planted trees comprise *Populus* spp. (Poplar), *Fraxinus excelsior* (Ash), *Alnus incana* (Grey Alder); *Salix* spp. (Willow) trees are also located here. They have approximate dbh's of 0.1 to 0.3 m. No features of potential value for roosting bats are visible.

Target Note 37. A band of dense *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) dominated scrub. Other shrub species present include *Rubus fruticosus* agg. (Bramble), *Sambucus nigra* (Elder), young *Quercus robur (*Pedunculate Oak) trees, *Rosa canina* agg. (Dog-rose) and *Syringa vulgaris* (Lilac). Where light reaches the floor, it is characterised by a carpet of *Hedera helix* (Ivy), *Glechoma hederacea* (Ground-ivy) and *Galium aparine* (Cleavers).

Target Note 38. A band of scrub (of variable width) on the eastern side of the ditch described in *Target Note 13.* It is dominated by *Crataegus monogyna* (Hawthorn) with *Rubus fruticosus* agg. (Bramble) and *Rosa canina* agg. (Dog-rose). Where present, the field-layer is species-poor and dominated by *Urtica dioica* (Common Nettle).

Target Note 39. Species-poor unimproved neutral grassland. Rough grassland with a tussocky, rank structure. The coarse-leaved grasses *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Elytrigia repens* (Common Couch) are co-dominant with other grasses present including *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue), *Phalaris arundinacea* (Reed Canary-grass) and *Deschampsia cespitosa* (Tufted Hair-grass). *Juncus inflexus* (Hard Rush) occasionally occurs. Tall-herbs and lower growing forbs are scattered throughout at low levels of abundance. These include *Anthriscus sylvestris* (Cow Parsley), *Heracleum sphondylium* (Hogweed), *Cardamine pratensis* (Cuckooflower), *Galium aparine* (Cleavers), *Epilobium hirsutum* (Great Willowherb), *Rumex acetosa* (Common Sorrel), *Potentilla reptans* (Creeping Cinquefoil), *Rumex obtusifolius* (Broad-leaved Dock), *Urtica dioica* (Common Nettle), *Vicia sativa* (Common Vetch) and *Vicia hirsuta* (Hairy Tare). Young *Crataegus monogyna* (Hawthorn) bushes are locally scattered and occasional tall-herb dominated stands occur (comprising *Epilobium hirsutum* (Great Willowherb), *Cirsium arvense* (Creeping Thistle) and *Urtica dioica* (Common Nettle). This area constitutes potential reptile habitat, although not of high quality.

In areas to the north (near the survey site boundary) the grassland is rank species-poor and dominated by *Alopecurus pratensis* (Meadow Foxtail), *Dactylis glomerata* (Cock's-foot) and *Holcus lanatus* (Yorkshire-fog) with locally abundant *Anthriscus sylvestris* (Cow Parsley). There are scattered patches of *Rubus fruticosus* agg. (Bramble) scrub and stands of *Epilobium hirsutum* (Great Willowherb) and *Urtica dioica* (Common Nettle). A small number of plants of *Primula veris* (Cowslip) were noted.

Target Note 40. A group of planted *Populus* spp. (Poplar), *Salix* spp. (Willow) and *Alnus incana* (Grey Alder) with approximate dbh's of 0.1 to 0.25 m. No features of potential value for roosting bats are visible.

Target Note 41. An open drain constructed of brick. It is water-filled.

Target Note 41a. A single adult female Great Crested Newt (*Triturus cristatus*) recorded under a piece of roofing felt (24/06/11).

Target Note 42. Mature *Crataegus monogyna* (Hawthorn) dominated scrub over disturbed ground (with approximate dbh's of 0.1 to 0.25 m). This scrub has established on a mound that may have been formed following past site ground clearance operations. The shrubs are often 4-5 m in height and may in places be better described as scrub-woodland, especially where young *Betula pendula* (Silver Birch) trees are frequent. *Rubus fruticosus* agg. (Bramble) is abundant, occasionally forming dense stands associated with *Urtica dioica* (Common Nettle), especially in more open areas. Other shrubs present include occasional *Salix cinerea* (Grey Willow) and *Salix caprea* (Goat Willow), with scattered shrubs of *Sambucus nigra* (Elder), *Prunus spinosa* (Blackthorn), young *Quercus robur* (Pedunculate Oak) trees and *Rosa canina* agg. (Dog-rose). The field-layer is species-poor, being locally dominated by *Urtica dioica* (Common Nettle) and frequent *Galium aparine* (Cleavers). Woodland herbs are limited to occasional plants of *Arum maculatum* (Lords-and Ladies) and *Mercurialis perennis* (Dog's Mercury) and the fern *Dryopteris filix-mas* (Male-fern). A wide range of other species often characteristic of more open habitats are scattered throughout, especially in small, open grass or tall-herb dominated areas.

This scrub (and other patches of scrub on land to the east of the ditch) provides potential nesting opportunities for a variety of small birds.

Target Note 42a. A recently cleared area within the mature scrub described at *Target Note 42.* It is now characterised by regenerating *Crataegus monogyna* (Hawthorn) stumps, low-growing *Rubus fruticosus* agg. (Bramble) and developing tall-herb/ ruderal vegetation. There are frequent piles of cut logs. The tall-herb vegetation is dominated by *Urtica dioica* (Common Nettle), with a wide variety of other tall-herbs, grasses and low growing forbs, such as locally abundant *Chamerion angustifolium* (Rosebay Willowherb), *Reseda luteola* (Weld), frequent *Solanum dulcamara* (Bittersweet), *Senecio jacobaea* (Common Ragwort) and locally frequent *Sonchus asper* (Prickly Sow-thistle), *Anagallis arvensis* (Scarlet Pimpernel), *Centaurea nigra* (Common Knapweed), *Tussilago farfara* (Colt's-foot), *Galium aparine* (Cleavers), *Verbascum thapsus* (Great Mullein). Occasional plants of *Helminthotheca echioides* (Bristly Ox-tongue), and *Papaver somniferum* (Opium Poppy) were also recorded.

Elsewhere within the mature scrub described at *Target Note 42*, recently cleared trackways are now dominated by the tall-herbs *Urtica dioica* (Common Nettle) and *Chamerion angustifolium* (Rosebay Willowherb).

Target Note 43. The remains of a male Mallard (*Anas platyrhynchos*); mostly feathers by a post that is approximately 1.5 m high. This bird may have been eaten by a Peregrine (*Falco peregrinus*).

Target Note 44. A stand of young, secondary, semi-natural broad-leaved woodland. This extends outside of the survey site. The canopy is dominated by *Betula pendula* (Silver Birch) with occasional *Salix cinerea* (Grey Willow) and, rarely, *Quercus robur* (Pedunculate Oak). The shrub layer is sparse, comprising scattered shrubs of *Crataegus monogyna* (Hawthorn), *Sambucus nigra* (Elder), *Rosa canina* agg. (Dog-rose) and associated scrambling *Lonicera pericylmenum* (Honeysuckle). The field-layer is generally species-poor with the woodland floor often carpeted with *Hedera helix* (Ivy). The tall-ruderal *Urtica dioica* (Common Nettle) forms locally frequent stands. Woodland herbs are limited to occasional plants of *Arum maculatum* (Lords-and-ladies), frequent *Alliaria petiolata* (Garlic Mustard) and *Geranium robertianum* (Herb-Robert). A range of other species often characteristic of more open habitats are scattered throughout.

Most of the trees have a dbh of approximately 0.2 m, up to 0.3 m. There is also a semi-mature *Quercus robur* (Pedunculate Oak) tree with an approximate dbh of 0.4 m. A small number of these

trees have dense growth of *Hedera helix* (Ivy) and *Lonicera periclymenum* (Honeysuckle) up the trunks. Most of the trees in the woodland have no potential value for roosting bats, but a small number as described are of low potential value. It should be noted that not all of the trees were inspected in detail.

Target Note 45. A small waterbody amongst scrub that measures approximately 3 m by 6 m. It is approximately 0.25 m deep and may not hold water throughout the year. The margins are dominated by *Epilobium hirsutum* (Great Willowherb) and *Filipendula ulmaria* (Meadowsweet) with lesser amounts of *Galium palustre* (Common Marsh-bedstraw). There is a large patch of *Glyceria fluitans* (Floating Sweet-grass) and *Agrostis stolonifera* (Creeping Bent) in the centre and *Lemna minor* (Common Duckweed) is also present. This waterbody provides sub-optimal habitat for Great Crested Newts. Although it may be used for foraging, and possibly egg-laying early in the season, reproduction is unlikely to be successful if the waterbody dries up. A second damp hollow adjacent to this waterbody is dominated by *Solanum dulcamara* (Bittersweet) and is drying out.

On 25/05/09 this waterbody was largely dry with a limited amount of surface water to 0.1 m deep at most. On 08/07/10 and 24/06/11 this feature was completely dry.

Target Note 46. A 'tongue' of scrub extending out into grassland. This resource is partly dominated by dense *Prunus spinosa* (Blackthorn) and partly by mosaics of low growing *Rubus fruticosus* agg. (Bramble). The Bramble has associated locally frequent *Crataegus monogyna* (Hawthorn), young *Fraxinus excelsior* (Ash) and *Betula pendula* (Silver Birch) with tall-herbs and coarse-leaved grasses.

Target Note 47. A line of scrub along the western side of a ditch recorded at *Target Note 13* (immediately adjacent to the site) [not assessed in detail]. Occasional narrow margins of tall-herb vegetation and species-rich neutral grassland are also located here immediately adjacent to a fence line (these are mostly too small to map on *Figure 2*).

Target Note 48. An attenuation lagoon, part of the Phase I development. This is located immediately adjacent to the site [not assessed in detail]. It is surrounded by permanent amphibian fencing. Water is restricted to a narrow strip down the middle of the lagoon. The banks support developing neutral grass and tall-herb vegetation.

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9 DATA

Table 19 – Vascular Plant Species Recorded During All Surveys

An * equates to Locally Scarce, and ** as Locally Rare, as per Green, 2006.

Plant species
Alnus glutinosa (Alder)
Alnus incana (Grey Alder)
Betula pendula (Silver Birch)
Corylus avellana (Hazel)
Crataegus monogyna (Hawthorn)
Fraxinus excelsior (Ash)
Malus pumila agg. (Apple)
Poplar sp. (a Poplar)
Prunus spinosa (Blackthorn)
Quercus robur (Pedunculate Oak)
Rosa canina agg. (Dog-rose)
Salix caprea (Goat Willow)
Salix cinerea (Grey Willow)
Salix spp.
Sambucus nigra (Elder)
Syringa vulgaris (Lilac)
Taxus baccata (Yew)
Achillea millefolium (Yarrow)
Achillea ptarmica (Sneezewort)
Agrimonia eupatoria (Agrimony)
Agrostis capillaris (Common Bent)
Agrostis stolonifera (Creeping Bent)
Alisma plantago-aquatica (Water-plantain)
Alliaria petiolata (Garlic Mustard)
Alopecurus pratensis (Meadow Foxtail)
Apium nodiflorum (Fool's-water-cress)
Anagallis arvensis (Scarlet Pimpernel)
Anthriscus sylvestris (Cow Parsley)
Arctium minus agg. (Lesser Burdock)
Arrhenatherum elatius (False Oat-grass)
Arum maculatum (Lord's-and-Ladies)
Asplenium scolopendrium (Hart's-tongue)
Azolla filiculoides (Water-fern)
Barbarea vulgaris (Winter-cress)
Bellis perennis (Daisy)
Bromus hordeaceus ssp. *hordeaceus* (Soft-brome)

Plant species
Callitriche stagnalis agg. (Common Water-starwort)
Calystegia sepium (Hedge Bindweed)
Cardamine hirsuta (Hairy Bitter-cress)
Cardamine flexuosa (Wavy Bitter-cress)
Cardamine pratensis (Cuckooflower)
Carex flacca (Glaucous Sedge)
Carex hirta (Hairy Sedge)
Carex otrubae (False Fox-sedge)
Carex leporina (Oval Sedge)
Carex pseudocyperus (Cyperus Sedge) *
Carex remota (Remote Sedge)
Centaurea nigra (Common Knapweed)
Centaurium erythraea (Common Centaury)
Cerastium fontanum (Common Mouse-ear)
Chaerophyllum temulum (Rough Chervil)
Chamerion angustifolium (Rosebay Willowherb)
Cirsium arvense (Creeping Thistle)
Cirsium palustre (Marsh Thistle)
Cirsium vulgare (Spear Thistle)
Conium maculatum (Hemlock)
Crepis vesicaria (Beaked Hawk's-beard)
Cynosurus cristatus (Crested Dog's-tail)
Dactylis glomerata (Cock's-foot)
Daucus carota (Wild Carrot)
Deschampsia cespitosa (Tufted Hair-grass)
Dipsacus fullonum (Teasel)
Dryopteris affinis (Scaly Male-fern)
Dryopteris dilitata (Broad Buckler-fern)
Dryopteris filix-mas (Male-fern)
Elytrigia repens (Common Couch)
Epilobium hirsutum (Great Willowherb)
Epilobium montanum (Broad-leaved Willowherb)
Equisetum arvense (Field Horsetail)
Festuca rubra (Red Fescue)
Filipendula ulmaria (Meadowsweet)
Galium aparine (Cleavers)
Galium palustre (Common Marsh-bedstraw)
Genista tinctoria (Dyer's Greenweed) *
Geranium dissectum (Cut-leaved Crane's-bill)
Geranium robertianum (Herb-Robert)
Glechoma hederacea (Ground-ivy)
Glyceria fluitans (Floating Sweet-grass)
Hedera helix (Ivy)
Helminthotheca echioides (Bristly Ox-tongue) *

Plant species
Heracleum sphondylium (Hogweed)
Holcus lanatus (Yorkshire-fog)
Hypericum hirsutum (Hairy St. John's-wort) *
Hypericum perforatum (Perforate St. John's-wort)
Iris pseudacorus (Yellow Iris)
Juncus articulatus (Jointed Rush)
Juncus conglomeratus (Compact Rush)
Juncus effusus (Soft-rush)
Juncus inflexus (Hard Rush)
Lactuca serriola (Prickly Lettuce) *
Lamium album (White Dead-nettle)
Lathyrus nissolia (Grass Vetchling) *
Lathyrus pratensis (Meadow Vetchling)
Lemna minor (Common Duckweed)
Lemna trisulca (Ivy-leaved Duckweed)
Leucanthemum vulgare (Oxeye Daisy)
Lonicera periclymenum (Honeysuckle)
Lolium perenne (Perennial Rye-grass)
Lotus corniculatus (Common Bird's-foot-trefoil)
Lotus pedunculatus (Greater Bird's-foot-trefoil)
Melilotus altissimus (Tall Melilot) **
Mercurialis perennis (Dog's Mercury)
Neottia ovata (Common Twayblade)
Papaver somniferum (Opium Poppy) *
Persicaria amphibia (Amphibious Bistort)
Petasites fragrans (Winter Heliotrope)
Phalaris arundinacea (Reed Canary-grass)
Phleum pratense (Timothy)
Plantago lanceolata (Ribwort Plantain)
Poa annua (Annual Meadow-grass)
Poa pratensis (Smooth Meadow-grass)
Poa trivialis (Rough Meadow-grass)
Polystichum aculeatum (Rough Shield-fern)
Potamogeton natans (Broad-leaved Pondweed)
Potentilla anserina (Silverweed)
Potentilla reptans (Creeping Cinquefoil)
Primula veris (Cowslip)
Prunella vulgaris (Selfheal)
Ranunculus acris (Meadow Buttercup)
Ranunculus repens (Creeping Buttercup)
Ranunculus sceleratus (Celery-leaved Buttercup)
Reseda luteola (Weld)
Ribes uva-crispa (Gooseberry)
Rubus fruticosus agg. (Bramble)

Plant species
Rumex acetosa (Common Sorrel)
Rumex crispus (Curled Dock)
Rumex conglomeratus (Clustered Dock)
Rumex obtusifolius (Broad-leaved Dock)
Schedonorus arundinaceus (Tall Fescue)
Senecio erucifolius (Hoary Ragwort) *
Senecio jacobaea (Common Ragwort)
Senecio vulgaris (Groundsel)
Solanum dulcamara (Bittersweet)
Sonchus arvensis (Perennial Sow-thistle)
Sonchus asper (Prickly Sow-thistle)
Sparganium erectum (Branched Bur-reed)
Stachys sylvatica (Hedge Woundwort)
Stellaria graminea (Lesser Stitchwort)
Stellaria media (Common Chickweed)
Tamus communis (Black Bryony)
Taraxacum sect. *Ruderalia* (Common Dandelion)
Torilis japonica (Hedge Parsley)
Typha latifolia (Bulrush)
Tragopogon pratensis (Goat's-beard)
Trifolium dubium (Lesser Trefoil)
Trifolium repens (White Clover)
Tussilago farfara (Colt's-foot)
Urtica dioica (Common Nettle)
Verbascum thapsus (Great Mullein)
Veronica chamaedrys (Germander Speedwell)
Veronica persica (Common Field-speedwell)
Vicia cracca (Tufted Vetch)
Vicia hirsuta (Hairy Tare)
Vicia sativa (Common Vetch)
Vicia sepium (Bush Vetch)
Vicia tetrasperma (Smooth Tare)

Table 20 – Bird Species Recorded During All Surveys

Species	Notes
Aegithalos caudatus (Long-tailed Tit)	
Anas platyrhynchos (Mallard)	Flying over site.
Anthus pratensis (Meadow Pipit)	One.
Apus apus (Swift)	Flying over site.
Ardea cinerea (Grey Heron)	Flying over site.
Branta canadensis (Canada Goose)	Flying over site.
Buteo buteo (Buzzard)	
Carduelis carduelis (Goldfinch)	
Carduelis chloris (Greenfinch)	
Certhia familiaris (Treecreeper)	
Columba palumbus (Woodpigeon)	
Corvus corone (Carrion Crow)	
Corvus frugilegus (Rook)	Flying over site.
Corvus monedula (Jackdaw)	Flying over site.
Cyanistes caeruleus (Blue Tit)	
Delichon urbica (House Martin)	Flying over site.
Dendrocopos major (Great Spotted Woodpecker)	Flying over site.
Emberiza schoeniclus (Reed Bunting)	
Erithacus rubecula (Robin)	
Falco peregrinus (Peregrine)	Flying over 25/05/09.
Fringilla coelebs (Chaffinch)	
Garrulus glandarius (Jay)	Recorded 25/05/09.
Hirundo rustica (Swallow)	Flying over site.
Locustella naevia (Grasshopper Warbler)	Single singing bird recorded 25/05/09.
Parus major (Great Tit)	
Phylloscopus collybita (Chiffchaff)	
Phylloscopus trochilus (Willow Warbler)	
Pica pica (Magpie)	
Prunella modularis (Dunnock)	
Pyrrhula pyrrhula (Bullfinch)	
Regulus regulus (Goldcrest)	
Scolopax rusticola (Woodcock)	3 seen 02/02/07 visit.
Streptopelia decaocto (Collared Dove)	
Sturnus vulgaris (Starling)	Flying over site.
Sylvia atricapilla (Blackcap)	
Sylvia borin (Garden Warbler)	Pair near ditch.
Sylvia communis (Whitethroat)	
Sylvia curruca (Lesser Whitethroat)	
Troglodytes troglodytes (Wren)	
Turdus merula (Blackbird)	
Turdus philomelos (Song Thrush)	Anvils noted in many areas of the site
Tyto alba (Barn Owl)	Single bird hunting along ditch, 23/05/07.

Table 21 – Other Species Recorded During All Surveys.

Species	Notes
Mammals	
Apodemus sylvaticus (Wood Mouse)	
Meles meles (Badger)	Frequent signs of activity.
Microtus agrestis (Field Vole)	
Oryctolagus cuniculus (Rabbit)	
Pipistrellus pipistrellus (Common Pipistrelle)	
Pipistrellus pygmaeus (Soprano Pipistrelle)	
Rattus norvegicus (Brown Rat)	Footprints and burrows along ditch. One seen.
Sorex araneus (Common Shrew)	
Talpa europaea (Mole)	
Vulpes vulpes (Fox)	Dung and kill remains. Sighting 25/05/09.
Amphibians	
Bufo bufo (Common Toad)	
Rana temporaria (Common Frog)	
Triturus cristatus (Great Crested Newt)	Mostly from ditch.
Lissotriton vulgaris (Smooth Newt)	
Lepidoptera	
Anthocaris cardamines (Orange-tip)	
Coenonympha pamphilus (Small Heath)	
Lycaena phlaeas (Small Copper)	
Maniola jurtina (Meadow Brown)	
Ochlodes venata (Large Skipper)	
Pararge aegeria (Speckled Wood)	
Pieris brassicae (Large White)	
Pieris napi (Green-veined White)	
Pieris rapae (Small White)	
Pyronia tithonus (Gatekeeper)	
Tyria jacobaeae (The Cinnabar)	
Vanessa cardui (Painted Lady)	25/05/09.
Odonata	
Coenagrion puella (Azure Damselfly)	
Enallagma cyathigerum (Common Blue Damselfly)	
Gomphus vulgatissimus (Club-tailed Dragonfly)	Single female recorded from scrub in area to east of ditch (20/05/07)
Ischnura elegans (Blue-tailed Damselfly)	
Libellula depressa (Broad-bodied Chaser)	
Pyrrhosoma nymphula (Large Red Damselfly)	
Miscellaneous	
Anguilla anguilla (Eel)	Present in ditch.

10 KEY LEGISLATION AND REGULATIONS

This section provides a brief summary of key legislation and regulations relevant to ecology and nature conservation. It should not be considered a comprehensive review and is not meant to be so. How this legislation relates to specific species is covered in *Section 6* of this report where relevant. The species-specific information provided in *Section 6* and the more general summary provided here is 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.

The Berne Convention on Conservation of European Wildlife and Natural Habitats, 1979.
This aims to conserve wild flora and fauna and their natural habitats, particularly endangered and vulnerable species. In the UK it has effect through the *Countryside Act, 1968* and the *Wildlife and Countryside Act, 1981.*

The Bonn Convention on Conservation of Migratory Species of Wild Animals, 1979.
This aims for management of migratory species across national or jurisdictional boundaries. This Convention is implemented in UK law by the *Environmental Protection Act, 1990.*

The EC Directive on *Conservation of Wild Birds, 1979* (The 'Birds Directive').
This requires Member States to take measures for the conservation of wild birds by the designation of Special Protection Areas (SPAs). The Directive is implemented in the UK through *The Conservation of Habitats and Species Regulations 2010.*

***The Wildlife and Countryside Act, 1981* (WCA).**
This strengthened protection for Sites of Special Scientific Interest (SSSIs), provided additional safeguards for particular types of area, and restricted the killing, taking from the wild and disturbance of various species.

The Convention on Biological Diversity, 1992.
Key objectives are the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of the benefits of the utilisation of genetic resources. The UK's non-statutory strategy for achieving these commitments was published in 1994, Biodiversity – The UK Action Plan.

The EC Directive on *Quality of Freshwaters Needing Protection or Improvement to Support Fish Life, 1978.*
This intended to protect or improve the quality of freshwaters capable of supporting fish life. It has been implemented by the *Surface Waters (Fish Life) Classification Regulations, 1997* under *Section 82* of the *Water Resources Act, 1991.*

The EC Directive on *Conservation of Natural Habitats and of Wild Fauna and Flora, 1992* (The 'Habitats Directive').
This contributes to the conservation of biodiversity by requiring Member States to take measures to maintain or restore natural habitats and wild species at favourable conservation status by the designation of Special Areas of Conservation (SACs). It modifies the *Birds Directive.*

The Conservation of Habitats and Species Regulations 2010
This gives UK implementation to the *EC Directive on Conservation of Natural Habitats and of Wild Fauna and Flora, 1992.*

The National Parks and Access to the Countryside Act, 1949.
This introduced the concept of National Nature Reserves and SSSIs and conferred powers on local authorities to create Nature Reserves. The *Countryside Act, 1968* strengthened many powers under the 1949 Act.

The Environmental Protection Act, 1990.
This established three country conservation councils (English Nature, Countryside Council for Wales and Scottish Natural Heritage) and the Joint Nature Conservation Committee to succeed the Nature Conservancy Council; and provided further protection for SSSIs.

The Ground Game Act, 1880 **and the** ***Hare Protection Act, 1911.***
These Acts gave Brown Hares limited protection.

The Protection of Badgers Act**, 1992.**
This protects Badgers and their setts.

The Hedgerow Regulations, 1997.
These regulations, made under *Section 97* of the *Environment Act, 1995*, require prior consent for the removal of a hedgerow.

The Countryside and Rights of Way Act, 2000 **(The CROW Act).**
This is the first major wildlife and countryside legislation since the Acts of 1949, 1968 and 1981. The Act covers the right of access to open land, updates to the public rights of way system, the legislation of the Biodiversity Action Plan, more stringent management, protection and consenting measures for SSSIs, greater penalties for wildlife crime, and new duties within Areas of Outstanding Natural Beauty. In addition, the Act lists species and habitats of principal importance for biodiversity (*Section 74*). It introduced a statutory duty for Government to promote steps "to further the conservation" of habitats and species listed in *Section 74.*

The Natural Environment and Rural Communities Act, 2006 **(The NERC Act)**
Sections 40 to *42* of the NERC Act replace *S74* of the CRoW Act. *Section 40* of the NERC Act extends to all public authorities (including local planning authorities) the existing *S74* duty to have regard to biodiversity as far as is consistent with the proper exercise of their functions.

Appendix 1 – Data supplied by Cofnod (Public Version)

Cofnod Environmental Information Search

- PUBLIC VERSION -

Please read **Important Issues** and **Notes** before interpreting the following information.

Our Ref.	Client Name	Date Run	Your Ref.
E02287	Marches Ecology	28/06/2011	Bryn Lane Phase II

Site Name	Grid Reference
Bryn Lane Phase II	SJ388499

Category 1 Species (Species with European and/or UK Legal Protection, Section 42 (NERC) Species or UK BAP Priority Species) **within 1000m** + 135 **records**

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ388499	5 records, between 11/04/2007 and 22/05/2007	Tom Knight			OTH:SA:140:2006		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ38934990	17/06/1992	Anon - Herpetofauna Consultants International			Adult Training Centre	Report identifies this as a probable record, supplied by local person.	D1125/001/03 *(1357617)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ388501 *(Selected from Interactive Map)*	11/05/2009 - 19/06/2009	Rhian Hughes	14 Maximum Count	Live sighting	Bryn Lane Recycling Centre	Tourch light survey.	D1117/001/01 *(2099500)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	1
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ388501	2 records, on 11/04/2007 and 21/11/2007	Stella Shackel; Tom Knight			OTH:SA:341:2006; OTH:SA:140:2006		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3886150171	Before 01/04/2007	Derek Whitcher	10 GCN (2005)		Wrexham Industrial Estate		D1125/001/03 *(1357953)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Locustella naevia *(Common Grasshopper Warbler/Troellwr Bach)*	SJ387501 *(Selected from Interactive Map)*	26/04/2011	Graham Berry	1 Adult	Auditory record	Bryn Lane Recycling Centre		D1117/001/01 *(2937907)*	S42, UKBAP, WBR[RSPB], LBAP[CON, DEN, FLI, GWY]	4
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ389501	9 records, between 19/04/2007 and 03/05/2007	Tom Knight			OTH:SA:140:2006		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Pyrgus malvae *(Grizzled Skipper/Gwibiwr Brith)*	SJ38875020 *(Selected from Interactive Map)*	07/05/2009	Graham Berry	1 Adult Male	Live Sighting	Bryn Lane Recycling Centre	Observed with Bryan Formstone, Lep. recorder.	D1117/001/01 *(2850949)*	S42, UKBAP, LBAP[DEN, FLI]	4
Lissotriton vulgaris *(Smooth Newt/Madfall Ddwr Gyffredin)*	SJ39064980	11/06/1992	Anon - Herpetofauna Consultants International					D1122/002/01 *(1271277)*	WCA5, LBAP[CON, DEN, FLI]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39064980	11/06/1992	Anon - Herpetofauna Consultants International	P		Adult Training Centre		D1125/001/03 *(1357490)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Ectiptopera silaceata *(Small Phoenix/Ffenics Bach)*	SJ386501	2 records, both on 07/05/2009	J B Formstone	1 Adult, 1 Adult	Daytime observation	Wrexham Recycling Centre	Substrate:Built-up areas: industrial	D1285/001/01	S42, UKBAP, LBAP[GWY]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3911650079	Before 01/04/2007	Derek Whitcher	1 GCN 05 (Terr Record)		Wrexham Industrial Estate		D1125/001/03 *(1357962)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ388496	3 records, all on 04/04/2005	Ben Milner			OTH:SA:32:2005		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ385500	14 records, between 01/05/2007 and 22/05/2007	Tom Knight			OTH:SA:140:2006		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3898850245	Before 01/04/2007	Derek Whitcher	Max Count 1 2005		Wrexham Industrial Estate		D1125/001/03 *(1357955)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3903250230	Before 01/04/2007	Derek Whitcher	Max Count 2 GCN (05)		Wrexham Industrial Estate		D1125/001/03 *(1357954)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3910250227	Before 01/04/2007	Derek Whitcher	Max Count 1 GCN (Terrestrial)		Wrexham Industrial Estate		D1125/001/03 *(1357956)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3925249954	Before 01/04/2007	Derek Whitcher	1 GCN (05)		Wrexham Industrial Estate	Terrestrial record.	D1125/001/03 *(1357960)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ389503	6 records, between 27/04/2005 and 04/06/2005	Janet Wilkinson			OTH:SA:117:2005		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Myotis mystacinus ***(Whiskered Bat/Ystlum Barfog)***	**SJ3849** ***(Estimated from Map)***	**28/09/1999**	**Anon**	**1**		**Site Name Withheld**		**D1049/001/02** ***(683472)***	**Bern, Bonn, EPS, HDir, WCA5, LBAP[DEN, FLI, GWY]**	**3**
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39200S0242	Before 01/04/2007	Derek Whitcher	6 GCN (05)		Wrexham Industrial Estate		D1125/001/03 *(1857957)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3932649952	Before 01/04/2007	Derek Whitcher	9 GCN (05)		Wrexham Industrial Estate	Terrestrial record.	D1125/001/03 *(1857970)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3919250294	Before 01/04/2007	Anon			Wrexham Industrial Estate		D1125/001/03 *(1857958)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Chiasmia clathrata *(Latticed Heath/Saffyr Dellog)*	SJ392502	11/06/1999	J.B. Formstone	2 Adult	Netted	Owens Corning Factory	Substrate:Scrub.	D1285/001/01 *(2919243)*	S42, UKBAP, LBAP[GWY]	3
Diloba caeruleocephala *(Figure of Eight/Crwbach Ffigwr Wyth)*	SJ392502	11/05/1999	J.B. Formstone	1 Larval	Daytime observation	Owens Corning Factory	Substrate:Scrub.	D1285/001/01 *(2896936)*	S42, UKBAP	3
Ediptopera silaceata *(Small Phoenix/Ffenics Bach)*	SJ385495	2 records, both in 1972	Mold NCC files, Z.D. Zamojski; Name Withheld	Present	Field Observation	Wrexham Industrial Estate		D0217/001/01 D1063/001/01	S42, UKBAP, LBAP[GWY]	3
Hemistola chrysoprasaria *(Small Emerald/Emrallt Barf yr Hen Wr)*	SJ385495	2 records, both in 1972	Name Withheld; Mold NCC files, Z.D. Zamojski	Present	Field Observation	Wrexham Industrial Estate		D1063/001/01 D0217/001/01	S42, UKBAP, LBAP[GWY]	3
Scotopteryx chenopodiata *(Shaded Broad-bar/Rhesen Lydan Dywyll)*	SJ392502	13/07/1999	J.B. Formstone	3 Adult	Netted	Owens Corning Factory	Substrate:Scrub.	D1285/001/01 *(2904625)*	S42, UKBAP, LBAP[GWY]	3
Tyria jacobaeae *(Cinnabar/Teigr y Benfelen)*	SJ392502	16/06/1999	J.B. Formstone	2 Adult	Netted	Owens Corning Factory	Substrate:Scrub.	D1285/001/01 *(2899976)*	S42, UKBAP, LBAP[GWY]	3
Watsonalla binaria *(Oak Hook-tip/Bachadain y Dderi)*	SJ385495	2 records, both in 1972	Name Withheld; Mold NCC files, Z.D. Zamojski	Present	Field Observation	Wrexham Industrial Estate		D1063/001/01 D0217/001/01	S42, UKBAP, LBAP[GWY]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39404992	17/06/1992	Anon - Herpetofauna Consultants International	P		Williams Distribution		D1125/001/03 *(1857616)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39034939	11/06/1992	Anon - Herpetofauna Consultants International			BICC Cables	Report identifies this as a probable record, supplied by local person.	D1125/001/03 *(1857495)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Bufo bufo *(Common Toad/Llyffant Dafadennog)*	SJ39345027	24/06/1992	Anon - Herpetofauna Consultants International					D1122/002/01 *(1271327)*	S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, GWY]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39345027	24/06/1992	Anon - Herpetofauna Consultants International	P		Cheetham Owens Fibreglass		D1125/001/03 *(1857688)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Coenonympha pamphilus *(Small Heath/Gweirlöyn Bach y Waun)*	SJ388493 *(Centroid)*	19/05/2004	Rob W. Whitehead	4	Field record / observation	Wrexham Ind Estate - S of Bryn Lane		D0127/001/02 *(538658)*	S42, UKBAP, LBAP[GWY]	3
Erynnis tages *(Dingy Skipper/Gwibwr Liwyd)*	SJ388493 *(Centroid)*	19/05/2004	Rob W. Whitehead	4	Field record / observation	Wrexham Ind Estate - S of Bryn Lane		D0127/001/02 *(538663)*	S42, UKBAP, LBAP[CON, FLI, GWY]	3
Pyrgus malvae *(Grizzled Skipper/Gwibwr Brith)*	SJ388493 *(Centroid)*	19/05/2004	Rob W. Whitehead	3	Field record / observation	Wrexham Ind Estate - S of Bryn Lane		D0127/001/02 *(538659)*	S42, UKBAP, LBAP[DEN, FLI]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ390493	3 records, all on 01/05/2004	Raymond Paul Gemmell			OTH:SA:83:2004		D1317/001/01	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39024932	11/06/1992	Anon - Herpetofauna Consultants International			BICC Cables	Report identifies this as a probable record, supplied by local person.	D1125/001/03 *(1857494)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Lissotriton vulgaris *(Smooth Newt/Madfall Ddwr Gyffredin)*	SJ39094934	11/06/1992	Anon - Herpetofauna Consultants International					D1122/002/01 *(1271278)*	WCA5, LBAP[CON, DEN, FLI]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39094934	11/06/1992	Anon - Herpetofauna Consultants International	P		BICC Cables		D1125/001/03 *(1857492)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Coenonympha pamphilus *(Small Heath/Gweirlöyn Bach y Waun)*	SJ385493 *(Centroid)*	2 records, on 01/06/1998 and 29/05/2001	John V. Smith; Bryan Formstone	2, 2	Field record / observation	Wrexham Industrial Estate	JVS's Map Ref SJ 384493 : also recorded PBF - not accepted yet.	D0127/001/02	S42, UKBAP, LBAP[GWY]	3
Erynnis tages *(Dingy Skipper/Gwibwr Liwyd)*	SJ385493 *(Centroid)*	29/05/2001	John V. Smith	2	Field record / observation	Wrexham Industrial Estate	JVS's Map Ref SJ 384493 : also recorded PBF - not accepted yet.	D0127/001/02 *(538663)*	S42, UKBAP, LBAP[CON, FLI, GWY]	3

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Lissotriton vulgaris *(Smooth Newt/Madfall Ddwr Gyffredin)*	SJ391493 *(Supplied by Original Recorder (Checked))*	06/03/1999	Jacinta Challinor	+		Wrexham Industrial Estate	Torch survey of 2+ ponds.	D0269/029/01 *(2697568)*	WCA5, LBAP[CON, DEN, FLI]	1
Pyrgus malvae *(Grizzled Skipper/Gwibiwr Britn)*	SJ385493 *(Centroid)*	2 records, in May 1993 and 01/06/1998	Bryan Formstone; J.B. Formstone	2, 2 Adult	Field record / observation; Daytime observation	Wrexham Industrial Estate		D0127/001/02	S42, UKBAP, LBAP[DEN, FLI]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ391493 *(Supplied by Original Recorder (Checked))*	06/03/1999	Jacinta Challinor	2 Male; 2 Female		Wrexham Industrial Estate	Torch survey of 2+ ponds.	D0269/029/01 *(2701908)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	1
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39484970	17/06/1992	Anon - Herpetofauna Consultants International	P		near Wrexham Industrial Estate		D1125/001/03 *(1857608)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Erynnis tages *(Dingy Skipper/Gwibiwr Llwyd)*	SJ387492 *(Centroid)*	21/05/2006	John V. Smith	1 Adult	Daytime observation	Wxm Ind Estate, Oak Road		D0127/001/02 *(543230)*	S42, UKBAP, LBAP[CON, FLI, GWY]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3947350326	Before 01/04/2007	Derek Whitcher	3 GCN (05)		Wrexham Industrial Estate		D1125/001/03 *(1857959)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Chiasmia clathrata *(Latticed Heath/Seffyr Delltog)*	SJ386492	22/06/2007	John Smith	2 Adult	Daytime observation	Wrexham Ind. estate	Substrate:Grassland: neutral.	D1285/001/01 *(2919265)*	S42, UKBAP, LBAP[GWY]	3
Ediptopera silaceata *(Small Phoenix/Pfenics Bach)*	SJ386492	1972	Z.D.Zamojski	1 Adult		Wrexham Ind Estate (Oaks Site)	Substrate:Scrub: scattered.	D1285/001/01 *(2905060)*	S42, UKBAP, LBAP[GWY]	3
Hemistola chrysoprasaria *(Small Emerald/Emrallt Bach yr Hen Wr)*	SJ386492	1973	Z.D.Zamojski	1 Adult	MV Light Trap	Wrexham Ind. estate	Substrate:Grassland: neutral.	D1285/001/01 *(2920978)*	S42, UKBAP, LBAP[GWY]	3
Watsonalla binaria *(Oak Hook-tip/Bachadain y Dan)*	SJ386492	1972	Z.D.Zamojski	1 Adult	MV Light	Wrexham Ind. estate	Substrate:Grassland: neutral.	D1285/001/01 *(2914361)*	S42, UKBAP, LBAP[GWY]	3
Lissotriton vulgaris *(Smooth Newt/Madfall Ddwr Gyffredin)*	SJ39525025	24/06/1992	Anon - Herpetofauna Consultants International					D1122/002/01 *(1271330)*	WCA5, LBAP[CON, DEN, FLI]	3
Rana temporaria *(Common Frog/Llyffant Melyn)*	SJ39525025	24/06/1992	Anon - Herpetofauna Consultants International					D1122/002/01 *(1271331)*	HDir, WCA5, LBAP[ANG, CON, FLI]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39525025	24/06/1992	Anon - Herpetofauna Consultants International			Wrexham Industrial Estate	Report identifies this as a probable record, supplied by local person.	D1125/001/03 *(1857693)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3981496 *(Estimated from Map)*	15/04/1998	Dylan Lloyd	1		Wrexham Industrial Estate - Field Corner Pond		D1125/001/03 *(1857566)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3957950187	Before 01/04/2007	Derek Whitcher	13 GCN (05)		Wrexham Industrial Estate		D1125/001/03 *(1857961)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39385050	24/06/1992	Anon - Herpetofauna Consultants International	P		Wrexham Industrial Estate		D1125/001/03 *(1857687)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39375052	24/06/1992	Anon - Herpetofauna Consultants International	P		Cheetham Owens Fibreglass		D1125/001/03 *(1857689)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Erynnis tages *(Dingy Skipper/Gwibiwr Llwyd)*	SJ388491	30/04/2007	Emma Broad	1		Off Oak Road Wrexham industrial Estate		D1117/001/01 *(2098631)*	S42, UKBAP, LBAP[CON, FLI, GWY]	4
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39584958	17/06/1992	Anon - Herpetofauna Consultants International	P		Cae Farm		D1125/001/03 *(1857612)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3957450364	Before 01/04/2007	Derek Whitcher	6 GCN (05)		Wrexham Industrial Estate		D1125/001/03 *(1857960)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Coenonympha pamphilus *(Small Heath/Gwerinlöyn Bach y Waun)*	SJ380502 *(Centroid)*	2 records, on 22/05/2004 and 25/05/2004	Rob W. Whitehead	2, 2	Field record / observation	Wrexham Ind Estate - Nonsh FP Ltd		D0127/001/02	S42, UKBAP, LBAP[GWY]	3
Erynnis tages *(Dingy Skipper/Gwibiwr Llwyd)*	SJ380502 *(Centroid)*	2 records, on 22/05/2004 and 25/05/2004	Rob W. Whitehead	4, 4	Field record / observation	Wrexham Ind Estate - Nonsh FP Ltd		D0127/001/02	S42, UKBAP, LBAP[CON, FLI, GWY]	3
Pyrgus malvae *(Grizzled Skipper/Gwibiwr Britn)*	SJ380502 *(Centroid)*	2 records, on 22/05/2004 and 25/05/2004	Rob W. Whitehead	2, 1	Field record / observation	Wrexham Ind Estate - Nonsh FP Ltd		D0127/001/02	S42, UKBAP, LBAP[DEN, FLI]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ39165074	17/06/1992	Anon - Herpetofauna Consultants International	P		Cheetham Owens Fibreglass		D1125/001/03 *(1857614)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ3972949880	Before 01/04/2007	Derek Whitcher	8 GCN (05)		School Farm		D1125/001/03 *(1857965)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Mustela putorius *(Polecat/Fflwbart)*	SJ388508	24/03/2004	John Smith		Road Casualty	Wrexham	Damaged. Probable female on weight evidence.	D1200/001/01 *(1105299)*	HDir, S42, UKBAP, LBAP[CON, FLI, GWY, SNP]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ379498 *(Estimated from Map)*	22/04/1998	Dylan Lloyd	7		Wrexham Industrial Estate - Typha pond		D1125/001/03 *(1857672)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ379500 *(Estimated (Centroid of Site Name))*	May 2004	Raymond Gemmell	+ Adult; + Juvenile; + Egg		Wrexham Industrial Estate	Bottle trap, torch survey and egg search.	D1310/001/01 *(2701533)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	1
Pipistrellus *(A Terrestrial Mammal)*	**SJ3849 *(Estimated from Map)***	**08/07/2003**	**Anon**	**2**		**Site Name Withheld**		**D1049/001/02 *(683546)***	**Bonn, EPS, WCA5**	**3**
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ38735091	18/06/1993	Anon - Herpetofauna Consultants International	P		near Wrexham Industrial Estate		D1125/001/03 *(1857643)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
Triturus cristatus *(Great Crested Newt/Madfall Ddwr Gribog)*	SJ381492 *(Estimated from Map)*	15/04/1998	Dylan Lloyd	1		Wrexham Industrial Estate - Drainage Ditch		D1125/001/03 *(1857565)*	Bern, EPS, HDir, S42, UKBAP, WCA5, LBAP[ANG, CON, DEN, FLI, SNP, WRE]	3
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[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]			[illegible]		[illegible]	[illegible]	
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	

Category 2 Species (Global Red List, British Red Data Book, Nationally Rare & Scarce, Welsh Red and Amber Birds & Welsh Vascular Plant Red Data List, where these are not identified in Category 1) **within 1000m - 5 records**

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Crepis biennis *(Rough Hawk's-beard/Gwaichlys Garw)*	SJ387494	1998	Anon			Redwither		D0216/001/02 *(1104136)*	WVP, LBAP[CON]	1
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Category 3 Species (LBAP Species not identified under Categories 1 & 2, Locally Important species as specified by local experts) **within 1000m - 19 records**

Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Libellula depressa *(Broad-bodied Chaser/Picellwr Praff)*	SJ388501 *(Selected from Interactive Map)*	07/05/2009	Graham Berry	1 Adult Female	Live sighting	Bryn Lane Recycling Centre	Over ponds created as part of mitigation for recycling centre development.	D1117/001/01 *(2099905)*	LBAP[SNP]	4
Lactuca serriola *(Prickly Lettuce/Letusen Bigog)*	SJ386495	1984	Anon			Industrial Estate		D0216/001/02 *(1104192)*	LBAP[CON]	1
Aeshna grandis *(Brown Hawker/Gwas Neidr Brown)*	SJ392502	13/07/1999	Bryan Formstone	1 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637873)*	LBAP[GWY, SNP]	3
Calopteryx splendens *(Banded Demoiselle/Morwyn Wych)*	SJ392502	18/07/1999	Bryan Formstone	1 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637916)*	LBAP[SNP]	3
Coenagrion puella *(Azure Damselfly/Mursen Las Asur)*	SJ392502	11/05/1999	Bryan Formstone	3 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637865)*	LBAP[SNP]	3
Ischnura elegans *(Blue-tailed Damselfly/Mursen Dinlas Gyffredin)*	SJ392502	16/06/1999	Bryan Formstone	2 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637900)*	LBAP[SNP]	3
Libellula depressa *(Broad-bodied Chaser/Picellwr Praff)*	SJ392502	08/07/1999	Bryan Formstone	1 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637961)*	LBAP[SNP]	3
Pyrrhosoma nymphula *(Large Red Damselfly/Mursen Fawr Goch)*	SJ392502	11/05/1999	Bryan Formstone	3 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637864)*	LBAP[SNP]	3
Sympetrum striolatum *(Common Darter/Gwiwell Gyffredin)*	SJ392502	18/08/1999	Bryan Formstone	3 Adult		Owens Corning Factory, Wrexham industrial estate		D0067/001/01 *(637917)*	LBAP[SNP]	3
Aeshna grandis *(Brown Hawker/Gwas Neidr Brown)*	SJ396500	01/08/1979	Taylor, R					D0158/003/01 *(2506623)*	LBAP[GWY, SNP]	1
Aeshna grandis *(Brown Hawker/Gwas Neidr Brown)*	SJ396500	01/08/1979	R. Taylor	Present Adult		Unknown		D0067/001/01 *(636538)*	LBAP[GWY, SNP]	3
Ischnura elegans *(Blue-tailed Damselfly/Mursen Dinlas Gyffredin)*	SJ396500	01/08/1979	R. Taylor	Present Adult		Unknown		D0067/001/01 *(636537)*	LBAP[SNP]	3
Ischnura elegans *(Blue-tailed Damselfly/Mursen Dinlas Gyffredin)*	SJ396500	01/08/1979	Taylor, R					D0158/003/01 *(2507736)*	LBAP[SNP]	1
Lestes sponsa *(Emerald Damselfly/Mursen Werdd)*	SJ396500	01/08/1979	Taylor, R					D0158/003/01 *(2507764)*	LBAP[SNP]	1
Lestes sponsa *(Emerald Damselfly/Mursen Werdd)*	SJ396500	01/08/1979	R. Taylor	Present Adult		Unknown		D0067/001/01 *(636536)*	LBAP[SNP]	3
Aeshna grandis *(Brown Hawker/Gwas Neidr Brown)*	SJ397499	01/08/1979	R. Taylor	Present Adult		Unknown		D0067/001/01 *(636540)*	LBAP[GWY, SNP]	3
Aeshna grandis *(Brown Hawker/Gwas Neidr Brown)*	SJ397499	01/08/1979	Taylor, R					D0158/003/01 *(2506622)*	LBAP[GWY, SNP]	1
Ischnura elegans *(Blue-tailed Damselfly/Mursen Dinlas Gyffredin)*	SJ397499	01/08/1979	Taylor, R					D0158/003/01 *(2507744)*	LBAP[SNP]	1
Ischnura elegans *(Blue-tailed Damselfly/Mursen Dinlas Gyffredin)*	SJ397499	01/08/1979	R. Taylor	Present Adult		Unknown		D0067/001/01 *(636539)*	LBAP[SNP]	3
Aeshna mixta *(Migrant Hawker/Gwas Neidr Mudol)*	SJ388509	12/09/2006	Bryan Formstone	4 Adult		Field pond, Wrexham industrial estate		D0067/001/01 *(637872)*	LBAP[SNP]	3
Ischnura elegans *(Blue-tailed Damselfly/Mursen Dinlas Gyffredin)*	SJ388509	01/09/2006	Bryan Formstone	2 Adult		Field pond, Wrexham industrial estate		D0067/001/01 *(637861)*	LBAP[SNP]	3
Lestes sponsa *(Emerald Damselfly/Mursen Werdd)*	SJ388509	06/08/1979	R. Taylor	Present Adult		Unknown		D0067/001/01 *(636562)*	LBAP[SNP]	3
Lestes sponsa *(Emerald Damselfly/Mursen Werdd)*	SJ388509	06/08/1979	Taylor, R					D0158/003/01 *(2507872)*	LBAP[SNP]	1
Sympetrum striolatum *(Common Darter/Gwiwell Gyffredin)*	SJ388509	12/09/2006	Bryan Formstone	4 Adult		Field pond, Wrexham industrial estate		D0067/001/01 *(637871)*	LBAP[SNP]	3
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Taxon Name	Grid Reference	Date	Recorder(s)	Abundance	Record Type	Site Name	Comments	Dataset ID	Lists	V
Pyrrhula pyrrhula (Linnaeus, 1758)	SJ3355	19/05/2021	Norman Hallas			Wrexham, Industrial Estate		DLDV3002:01 (1458421)	Birds, LBAP(CDW)	
Hylaeosoma colonus (Sonnini & Latreille, 1804)	SJ3557	15/05/2021	Norman Hallas	1		Wrexham, Industrial Estate	3 adults	DLDV3002:01 (1452403)	LBAP(CDW)	
Musela muscaria (Hedge Accentor) (Linnaeus, 1758)	SJ3357	15/05/2021	Norman Hallas	1		Wrexham, Industrial Estate		DLDV3002:01 (1453845)	Birds, LBAP(CDW)	
Sphia sphegifa (Esper, 1792) (Thick-legged Flower Beetle)	SJ3357	19/05/2021	Norman Hallas	1		Wrexham, Industrial Estate		DLDV3002:01 (1452705)	LBAP(CDW)	
Eubranchipus grubii (Dybowski, 1860) (Common Eubranchipus)	SJ3358	19/05/2021	Norman Hallas	1		Wrexham, Industrial Estate, E	P.400m?	DLDV3002:01 (1453179)	Scarce, OTHER, LBAP(CDW)	
Cepaea hortensis (Müller, 1774) (Northern Banded Snail)	SJ3358	15/05/2021	Norman Hallas	1		Wrexham, Industrial Estate, E	1 adult	DLDV3002:01 (1457496)	Birds, LBAP(CDW)	
Cepaea nemoralis (Linnaeus, 1758) (Grove Snail, Brown Lipped)	SJ3358	19/05/2021	Norman Hallas	2		Wrexham, Industrial Estate, E		DLDV3002:01 (1453184)	Birds, LBAP(CDW)	
Pyrrhula pyrrhula (Linnaeus, 1758) (Bullfinch, Eurasian Bullfinch)	SJ3358	19/05/2021	Norman Hallas	1		Wrexham, Industrial Estate, E		DLDV3002:01 (1458516)	Birds, LBAP(CDW)	
Hylaeosoma colonus (Sonnini & Latreille, 1804) (Common Clerid Beetle)	SJ3359	19/05/2021	Norman Hallas	1		Wrexham, Industrial Estate, E	5 adults	DLDV3002:01 (1458545)	LBAP(CDW)	
Rhamnusium bicolor (Linnaeus, 1758) (Two-banded Longhorn Beetle)	SJ3359	1999	Anon					DLDV3002:01 (1334364)	Scarce, LBAP(CDW), UKBAP	

Statutory Sites intersecting 1000m buffer	None
Wildlife Sites within 1000m (C=Candidate)	Wrexham Industrial Estate (22m)
NWWT Reserves within 1000m	None
RSPB Reserves within 1000m	None
RIGS within 1000m	None
Habitat type at application grid reference	Semi-improved Neutral Grassland
Habitat type(s) within 1000m	Amenity Grassland, Arable, Bare Ground, Buildings, Dense Scrub, Ephemeral/Short Perennial, Gardens, Improved Grassland, Not Accessed Land, Planted Broad-leaved Woodland, Running Water, Semi-improved Neutral Grassland, Semi-natural Broad-leaved Woodland, Standing Water, Tall Ruderal Herb
Ancient Woodland within 1000m	None

Important Issues

1. Usage of the above information is governed by Cofnod's **Terms and Conditions of Data Release** (available from Cofnod on request).

2. Records shown in bold typeface are sensitive species records. In this public version of the original report, the resolution of sensitive species grid references have been reduced and site names and comments have been removed.

3. Past records of presence of a habitat or species do not guarantee continued occurrence; absence of records does not imply absence of a species, merely that no records are held at Cofnod; Cofnod cannot guarantee the accuracy of supplied data; copyright of records remains with the original recorder.

Notes

This report should be used in conjunction with any relevant maps, where these are supplied.

Cofnod uses a search system which reports species (usually high priority or protected species) within a specified search radius or buffer. Where required a search will also include high priority 'Mobile Species', such as bats, otters, amphibians and certain invertebrates, which lie outside the specified search radius. These species are highlighted on the report with an **asterisk**. They have been selected as 'Mobile Species' as their territory (possibly due to foraging activity or life cycle) could intersect with the search radius. The list of 'Mobile Species', invasive non-native plant species and species categories used in Cofnod's reporting system can be found at http://www.cofnod.org.uk/Enquiries.aspx under the 'Species Categories' tab.

Records with 4 figure grid references are displayed as 1km squares on any relevant maps. They are listed separately in reports and highlighted in grey *italic* script.

Please note that while we hold Wales Raptor Study Group data for North East Wales we are only permitted to release it to a limited number of trusted partners. We can provide contact details if you would like to contact the Raptor Study Group directly to request species information.

Sites - Designated Sites and non-designated Wildlife Sites within 50m of the grid reference are highlighted in red. Wildlife Sites which remain unconfirmed by the relevant Local Authority are given 'Candidate' status and are displayed with the (c) suffix. The following reasons for candidate status apply: 1. Anglesey and Flintshire Wildlife Sites were identified by survey but have not been formally confirmed. 2. Conwy and Gwynedd Wildlife Sites were identified by survey and air photos and remain candidate until evaluated using selection criteria.

Dataset ID - All species records within the reports include Dataset ID codes, which can be used to find the relevant Metadata, using the **Data We Hold** page on the Cofnod website (www.cofnod.org.uk/DataWeHold.aspx). The number below the Dataset ID is the individual record ID. Please quote this if you need more information on a specific record.

'V' column - Record Verification Level. The following abbreviations apply: **1**: Unassessed, **2**: Unconfirmed, **3**: Considered Correct by Cofnod, **4**: Considered Correct by Expert. Dataset Categories and Record Verification Levels are explained in more detail within Cofnod's policy on Data Quality, available from our website.

Maps - This report should be used in conjunction with any relevant maps, where these are supplied. Where Statutory protected sites (e.g. SSSI, SAC, SPA) are displayed on Cofnod maps, more details can be obtained from Countryside Council for Wales. (Visit their website at http://www.ccw.gov.uk/interactive-maps/official-maps-search.aspx) Where a Phase 1 Habitat map has been supplied, this illustrates habitats mapped by CCW as part of their Habitat Survey of Wales 1979 to 1997. A separate legend is also supplied.

Lists

BA - Protection of Badgers Act, **BDir** - EU Birds Directive, **Bern** - The Bern Convention on the Conservation of European Wildlife and Natural Habitats, **Bonn** - The Bonn Convention on the Conservation of Migratory Species of Wild Animals, **CCWP** - CCW Priority Species List, **CITES** - Convention on International Trade in Endangered Species, **EPS** - European Protected Species, **HDir** - EU Habitats Directive, **LI** - Locally Important Species, identified by the County Recorder as being of particular importance in the specified Vice-County (see below for a list of Vice-Counties) N.B: Only available for certain species groups and certain areas, **LBAP** - Local Biodiversity Action Plan, **RD1** - Red Data Book listing based on IUCN guidelines, **RD2** - Red Data Book listing not based on IUCN guidelines (Nationally Rare and Scarce), **S42** - Natural Environment and Rural Communities Act 2006 (Section 42), **UKBAP** - UK Biodiversity Action Plan Priority Species, **WBAm[RSPB]** - Birds of Conservation Concern 2002-07 - Welsh Amber listed birds (not based on IUCN criteria), **WBR[RSPB]** - Birds of Conservation Concern 2002-07 - Welsh Red listed birds (not based on IUCN criteria), **WCA1** - Wildlife & Countryside Act 1981 Schedule 1, **WCA5** - Wildlife & Countryside Act 1981 Schedule 5, **WCA8** - Wildlife & Countryside Act 1981 Schedule 8, **WVP** - IUCN Threat Listing of Welsh Vascular Plants

Abbreviations

ANG - Isle of Anglesey, **CON** - Conwy, **DEN** - Denbighshire, **FLI** - Flintshire, **GWY** - Gwynedd, **SNP** - Snowdonia National Park, **WRE** - Wrexham, **LBAP** - Local Biodiversity Action Plan, **NWWT** - North Wales Wildlife Trust, **RSPB** - Royal Society for the Protection of Birds, **RIGS** - Regionally Important Geodiversity Sites, **WS** - Wildlife Site

Vice-Counties

48 - Meirionethshire, **49** - Caernarfonshire, **50** - Denbighshire, **51** - Flintshire, **52** - Anglesey

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SCHEDULE 4

Ecological Management Plan

Report Title	Wrexham Recycling Park Phase II, Bryn Lane - Ecological Management Plan
Client	Stratus Environmental Ltd
Date	December 2011

this report was produced by

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Report Title	Wrexham Recycling Park Phase II, Bryn Lane - Ecological Management Plan
Client	Stratus Environmental Ltd
Marches Ecology Ref	C170/EMP
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CONTENTS

1 VISION STATEMENT/ EXECUTIVE SUMMARY 4

1.1 General Introduction 4
1.2 Vision Statement 5
1.3 Executive Summary 5
1.4 Wildlife Legislation and Policy 6
1.5 Structure of this Management Plan 8

2 GENERAL DESCRIPTION 9

2.1 General Information 9
2.2 Zones 9
2.3 Environmental Information 10
2.4 Cultural 12
2.5 Landscape 13
2.6 Bibliography 14

3 NATURE CONSERVATION FEATURES OF INTEREST 15

3.1 Identification and Confirmation of Conservation Features 15

4 OBJECTIVES AND MONITORING 17

4.1 Great Crested Newts 17
4.2 Amphibians 19
4.3 Breeding Birds 20
4.4 Neutral Grassland 21

5 MANAGEMENT PROJECTS 23

6 OPERATIONAL OBJECTIVES 30

7 ACTION PLAN 31

8 PROJECT RECORDING AND REVIEW 33

Figure 1 – Location of Phase II Mitigation Area
Figure 2 – Management Zones and Summary Management Proposals
Figure 3 – Phase 1 Habitat Map
Figure 4 – Location of Wrexham Industrial Estate Wildlife Site (W337) at Bryn Lane
Figure 5 – Great Crested Newt Records Around the Site

1 VISION STATEMENT/ EXECUTIVE SUMMARY

1.1 General Introduction

1.1.1 The format of this Management Plan is adapted from that provided by Alexander (2005[1]). It only includes relevant sections and has been simplified appropriate to its purpose. This Management Plan was written by Marches Ecology in consultation with Waste Recycling Group. It will be subject to review with the planning authority, Countryside Council for Wales (CCW) and a third party (who will manage the site on behalf of WRG once it has been developed). It covers a period of 25 years. Management prescriptions are provided for a five-year period after which a review will take place and a new Action Plan compiled for the next five-year period.

1.1.2 The Management Plan concerns an area shown as the 'Mitigation Area' on the *'Landscaping Proposals*[2]' plan submitted with the planning application. It had previously been referred to as the 'compensation area' in the Ecological Impact Assessment (EcIA[3][4]) also submitted with the application. For consistency this area will henceforth be referred to as the 'Phase II Mitigation Area'. This Management Plan is provided as supporting information to the planning application.

1.1.3 The Phase II mitigation area will be provided to mitigate and compensate for any potential impacts on the Favourable Conservation Status of the local Great Crested Newt (*Triturus cristatus*) population/s as a result of the Phase II development. As such management of this area concentrates on this key species. However provision is also made in this area to compensate for impacts on certain habitats and other species (in particular grassland, scrub, Badger, bats and birds). The Management Plan identifies existing ecological features of interest within the Phase II mitigation area where known. *Figure 1* shows the location of the Phase II mitigation area and the land to be developed.

1.1.4 While Badgers use the Phase II mitigation area due to the sensitive nature of this information they will not be discussed further in this Management Plan. No specific management prescriptions are provided for them although management undertaken for other species/ habitats is also likely to be indirectly beneficial. The presence of Badgers on the site does have implications for anyone undertaking management operations and as such the managing organisation should ensure that they are aware of this.

1.1.5 The start date of this Management Plan has been assumed to be following completion of the mitigation programme (*e.g.* after translocation of amphibians from the development site and creation of the new ponds and hibernacula within the Phase II mitigation area). The Management Plan does not cover habitat creation as part of this mitigation scheme. Habitat

[1] Alexander, M. (2005). *The CMS Management Planning Guide*. CMS Consortium, Talgarth, Wales, UK. www.esdm.co.uk/cms

[2] *'Landscaping Proposals'*, Dwg. no. WR7042/19/12, Rev. 0, dated 7th September 2011.

[3] Marches Ecology (2011a). *Wrexham Recycling Park Phase II, Bryn Lane, Wrexham Industrial Estate - Ecological Impact Assessment*. Unpublished report produced on behalf of Stratus Environmental Ltd.

[4] Marches Ecology (2011b). *Wrexham Recycling Park Phase II, Bryn Lane, Wrexham Industrial Estate - Ecological Impact Assessment: Confidential Badger Annex*. Unpublished report produced on behalf of Stratus Environmental Ltd.

creation is detailed separately in the Ecological Mitigation Method Statement[5]. The Action Plan includes management prescriptions for after-care of the newly created habitats. The Phase II mitigation area and compensation within the wider scheme are also, in part, provided to satisfy the requirements of the Wrexham Unitary Development Plan (UDP) General Development Principle:

- **Policy** GDP1. *All new development should: h). Safeguard sites and areas of nature conservation and wildlife interest, and to provide new habitats where there is an unavoidable loss of existing habitats and areas of wildlife interest.*

1.2 Vision Statement

1.2.1 The aim of management of the Phase II mitigation area will be to provide habitat for Great Crested Newts during both their terrestrial and aquatic phases, and throughout the year. Initially the habitat will be enhanced through the provision of three new ponds. In addition two hibernacula will be provided. Areas of rough grassland will be managed through limited intervention and infrequent cutting, with scrub managed through non-intervention or on a long-term rotation. The existing area of woodland will largely be managed through non-intervention wherever possible. Terrestrial habitat management will produce a mosaic of woodland, patches of scrub of varying age and grassland at varying heights.

1.2.2 Initial management of the new ponds will aim to provide suitable conditions for Great Crested Newts to breed. In the first few years this may include provision of egg-laying strips. Subsequent management of the ponds will be on medium-term rotation and will seek to maintain a diverse marginal and aquatic flora with areas of open water.

1.2.3 While Great Crested Newts are the primary feature of importance, several secondary features have been identified for which management prescriptions have been provided. The secondary features are as follows:

- Other species of amphibian;
- Breeding birds;
- Species-rich neutral grassland; and
- Scrub.

1.3 Executive Summary

1.3.1 This Management Plan will be reviewed every five years and amended as necessary to ensure the objectives are being met. As this is a new Management Plan and some of the habitat is to be created the first review will follow after two years to ensure that the management prescriptions are achieving the objectives set.

1.3.2 The Phase II mitigation area is to be provided in compensation for the loss of habitat and wildlife due to the proposed Phase II development. The nature conservation features of interest of the Phase II mitigation area have been identified as Great Crested Newts, other amphibians, breeding birds (for example, Song Thrush), neutral grassland and scrub. The species-rich grassland associated with the Wildlife Site will be managed both to benefit floral

[5] Marches Ecology (2011c). *Wrexham Recycling Park Phase II, Bryn Lane, Wrexham Industrial Estate - Ecological Mitigation Method Statement.* Unpublished report produced on behalf of Stratus Environmental Ltd.

diversity and to provide appropriate conditions for key species. Management operations have been prescribed for these features that include:

- The management of three new ponds;
- Annual mowing of grassland areas to benefit Great Crested Newts and floristic diversity;
- Rotational management of new planted scrub to benefit Great Crested Newts and breeding birds;
- Non-intervention in some areas of scrub and woodland to benefit Great Crested Newts and breeding birds; and
- Maintenance of a number of bird boxes.

1.3.3 In order to ensure that management is achieving the conservation objectives a number of monitoring projects have been prescribed including:

- An annual Great Crested Newt survey, as well as monitoring for Smoot Newt;
- Mapping of breeding birds;
- Monitoring of the population of Grass Vetchling; and
- Monitoring of the presence/ absence of non-native invasive plants and fish.

1.3.4 The success of management and the results of the monitoring will be reported and reviewed annually.

1.4 Wildlife Legislation and Policy

Introduction

1.4.1 This sub-section provides a brief summary of key 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 reproduce the text of the legislation, but summarises the salient points.

Badger

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;
- intentionally or recklessly interfere with a sett by damaging or destroying it;
- intentionally or recklessly obstruct access to, or any entrance of, a Badger sett; or
- intentionally or recklessly disturb a Badger when it is occupying a sett.

1.4.3 A Badger sett is defined in the legislation as '*any structure or place, which displays signs indicating current use by a Badger*'. The guidance provided in CCW (2011) indicates that a sett also includes '*seasonally used setts*'. This may extend to outliers and possibly day-nests/couches.

1.4.4 With regards '*current use*' CCW (2011) states that '*Before a sett can be damaged or closed without a licence it would have to be demonstrated that the sett had been abandoned by badgers and is not just currently unoccupied. Monitoring for a period of up to 12 months may be needed to demonstrate this*'.

1.4.5 The Wrexham Biodiversity Action Plan (Wrexham County Borough, 2003) includes a SAP for Badgers in Wrexham. The Wrexham BAP is a supplementary planning guidance document.

Great Crested Newts

1.4.6 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* (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.

1.4.7 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.

1.4.8 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. There is also a SAP for Great Crested Newts in Wrexham (Wrexham County Borough, 2003).

1.4.9 In order to undertake actions affecting Great Crested Newts which would normally be prohibited by law (such as capturing newts, or damage to terrestrial or aquatic habitat), a licence is required. 'Conservation' licenses are issued by CCW. Such licenses can only be issued if they meet the purpose of conservation. Virtually all management prescriptions that involve physical disturbance of the habitat within the site (*e.g.* aquatic plant management, dredging) would require a conservation licence.

Birds

1.4.10 All species of bird are protected under *Section 1* of the *Wildlife and Countryside Act 1981* (as amended). The protection was extended by the CRoW Act.

1.4.11 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.

Industrial Estate Wildlife Site. Zone 2 will also contain the three ponds to be created. The grassland and scrub in this zone will be subject to limited/ non-intervention for the benefit of Great Crested Newts. Zone 3 includes all of the area within which scrub habitat is to be created and will be managed on long-term rotation.

2.3 Environmental Information

Biological

Habitats/communities

2.3.1 The Phase II mitigation area has been subject to an Extended Phase 1 Habitat Survey undertaken in March 2007 and subsequent walkover surveys in May 2009, July 2010 and June 2011. It largely comprises a mosaic of unimproved neutral grassland, *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn) scrub and tall herb vegetation with a few trees. A small, separate, area of young *Betula pendula* (Silver Birch) is located to the west of the proposed development. A ditch forms part of the western boundary. Accordingly, habitat types recorded are as follows:

- *Betula pendula* (Silver Birch) dominated semi-natural woodland in the west of the site;
- Mature *Crataegus monogyna* (Hawthorn) scrub;
- Scattered scrub, particularly adjacent to fence lines, boundaries and along the ditch;
- Scattered young, largely planted, trees mostly along the eastern boundary of the site;
- Neutral grassland of varying species richness, mostly dominated by a small number of coarse-leaved grasses. More species-rich grassland occurs in the northeast part of the site; and
- Stands of tall herbs/ *Rubus fruticosus* agg. (Bramble).

Woodland

2.3.2 There is a stand of young, secondary, semi-natural broad-leaved woodland in the western corner of the site; in a separate parcel to the main block of the Phase II mitigation area. The canopy is dominated by *Betula pendula* (Silver Birch) with occasional *Salix cinerea* (Grey Willow) and, rarely, *Quercus robur* (Pedunculate Oak). The shrub layer is sparse, comprising scattered *Crataegus monogyna* (Hawthorn), *Sambucus nigra* (Elder), *Rosa canina* agg. (Dog-rose) and associated scrambling *Lonicera periclymenum* (Honeysuckle). The field layer is generally species-poor with the woodland floor often carpeted with *Hedera helix* (Ivy). The tall ruderal *Urtica dioica* (Common Nettle) forms locally frequent stands. Woodland herbs are limited to occasional plants of *Arum maculatum* (Lords-and Ladies), frequent *Alliaria petiolata* (Garlic Mustard) and *Geranium robertianum* (Herb-Robert). The locally scarce plant *Hypericum hirsutum* (Hairy St. John's-wort) is also present. A range of other species often characteristic of more open habitats are scattered throughout.

Scrub

2.3.3 A band of scrub of variable width dominates the eastern side of the ditch that forms part of the western boundary of the Phase II mitigation area. It is dominated by *Crataegus monogyna* (Hawthorn) with *Rubus fruticosus* agg. (Bramble) and *Rosa canina* agg. (Dog-rose). Where present, the field layer is species-poor and dominated by *Urtica dioica* (Common Nettle). The patches of dense scrub in the centre of the site are largely dominated

by *Rubus fruticosus* agg. (Bramble) or dense *Crataegus monogyna* (Hawthorn) and *Prunus spinosa* (Blackthorn).

2.3.4 Several areas along the eastern boundary with Bryn Lane support planted scrub and young trees such as *Alnus glutinosa* (Alder), *Alnus incana* (Grey Alder), *Fraxinus excelsior* (Ash), *Quercus robur* (Pedunculate Oak) and *Salix caprea* (Goat Willow) with occasional larger *Populus* sp. (a Poplar) trees.

Neutral Grassland

2.3.5 That part of the Phase II mitigation area located within the Wrexham Industrial Estate Wildlife Site is characterised by a mosaic of unimproved neutral grassland and scrub. Most of the grassland is located within a southern central strip and the northern half of this area; the former being species-poor, and the latter, in part, species-rich.

2.3.6 The species-poor neutral grassland has a tussocky, rank structure. The coarse-leaved grasses *Arrhenatherum elatius* (False Oat-grass), *Dactylis glomerata* (Cock's-foot) and *Elytrigia repens* (Common Couch) are co-dominant with other grasses present including *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue), *Phalaris arundinacea* (Reed Canary-grass) and *Deschampsia cespitosa* (Tufted Hair-grass). *Juncus inflexus* (Hard Rush) is occasional. Tall-herbs and lower growing forbs are scattered throughout at low levels of abundance. These include *Anthriscus sylvestris* (Cow Parsley), *Heracleum sphondylium* (Hogweed), *Cardamine pratensis* (Cuckooflower), *Cirsium arvense* (Creeping Thistle), *Galium aparine* (Cleavers), *Epilobium hirsutum* (Great Willowherb), *Rumex acetosa* (Common Sorrel), *Potentilla reptans* (Creeping Cinquefoil), *Rumex obtusifolius* (Broad-leaved Dock), *Urtica dioica* (Common Nettle), *Vicia sativa* (Common Vetch) and *Vicia hirsuta* (Hairy Tare). There are occasional stands of tall-herb comprising *Epilobium hirsutum* (Great Willowherb) and *Urtica dioica* (Common Nettle).

2.3.7 Where the grassland is more species-rich the sward generally has a variable structure and comprises a variety of grasses such as *Arrhenatherum elatius* (False Oat-grass), *Cynosurus cristatus* (Crested Dog's-tail), *Deschampsia cespitosa* (Tufted Hair-grass), *Dactylis glomerata* (Cock's-foot), *Holcus lanatus* (Yorkshire-fog), *Alopecurus pratensis* (Meadow Foxtail), *Festuca rubra* (Red Fescue) and *Phalaris arundinacea* (Reed Canary-grass). A range of herbs and forbs are scattered throughout such as *Centaurea nigra* (Common Knapweed), *Achillea millefolium* (Yarrow), *Geranium dissectum* (Cut-leaved Crane's-bill), *Trifolium repens* (White Clover), *Senecio jacobaea* (Common Ragwort), *Bellis perennis* (Daisy), *Leucanthemum vulgare* (Oxeye Daisy), *Cerastium fontanum* (Common Mouse-ear) and *Daucus carota* (Wild Carrot). The locally scarce plant *Lathyrus nissolia* (Grass Vetchling) is present. This grassland is generally located in a mosaic with stands of tall ruderals and small patches of scrub.

Flora

2.3.8 Six plant species of note are known to be present: *Senecio erucifolius* (Hoary Ragwort), *Lathyrus nissolia* (Grass Vetchling), *Lactuca serriola* (Prickly Lettuce), *Hypericum hirsutum* (Hairy St. John's-wort), *Helminthotheca echioides* (Bristly Ox-tongue) and *Melilotus altissimus* (Tall Melilot). Five of these plants are identified as 'scarce[6]' in VC50 –

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

Denbighshire while the latter is 'rare[7]' (Green 2006). Prickly Lettuce and Tall Melilot are also described as 'established' i.e. non-native. Prickly Lettuce is noted as 'locally threatened' in the provisional list of Locally Important/ Endangered Species (WCB 2003). Both Cheffings & Farrell (2005) and Dines (2008) categorise all of these plants as of 'Least Concern' in the most recent Vascular Plant Red Data List for Great Britain and Wales respectively.

Fauna

2.3.9 The Phase II mitigation area has been the subject of a range of ecological surveys. These are listed and discussed in Marches Ecology (2011a). The ecological surveys undertaken to inform the EcIA included an Extended Phase I Habitat Survey and detailed surveys for Great Crested Newts, reptiles, breeding birds, Badgers, bats, Water Voles and Otters. The Extended Phase I Habitat Survey Map is presented as *Figure 3.* Findings of these surveys are as follows:

- A maximum of three Great Crested Newts have been recorded from the ditch directly adjacent to the Phase II mitigation area;
- The ditch and surrounding terrestrial habitat support healthy populations of Smooth Newt (*Triturus vulgaris*), Common Toad (*Bufo bufo*) and Common Frog (*Rana temporaria*);
- Barn Owls (*Tyto alba*) occasionally hunt over the grassland;
- Breeding birds are largely confined to the Birch woodland and areas of scrub. Such species include Song Thrush, Reed Bunting by the ditch, Bullfinch, Dunnock and Willow Warbler. Fifteen species of bird are known to have bred on the site during 2007 (excluding corvids and pigeons);
- Badgers forage on the site and there are several well used paths through the Phase II mitigation area; and
- Common Pipistrelle (*Pipistrellus pipistrellus*) and Soprano Pipistrelle (*Pipistrellus pygmaeus*) bats have been recorded foraging across the site in 2007.

2.4 Cultural

2.4.1 There is insufficient information available to complete many of the sub-sections normally included in this section.

Past/ Present Land Use

2.4.2 The Phase II mitigation area is a brownfield site that is typical of many on Wrexham Industrial Estate. The habitat and wildlife interest has developed over a number of years in the absence of active management or other direct disturbance. No other information is available regarding past land use.

Present Legal Status of the Site

2.4.3 The eastern part of the site, between the ditch and Bryn Lane is included in the Wrexham Industrial Estate (W337) County Wildlife Site (*Figure 4*). This is a non-statutory designation notified by Wrexham County Borough Council. The Wildlife Site is split into three locations including Bryn Lane (Grid ref. SJ 389 499). It is described as derelict land with a complex mosaic of scrub, species-rich grassland and tall herb communities. The grassland within the

[7] In Vice County 50, a rare plant is described as being recorded in 1-3 10 km squares.

Wildlife Site contains several locally uncommon species of plant. The Unitary Development Plan has a policy on biodiversity conservation that is of direct relevance, as follows:

- **Policy EC6**. *Development either within or close to sites of biodiversity interest will only be permitted where it can clearly demonstrated that the need for the development outweighs the need to safeguard the intrinsic nature conservation value of the site. Where such development is permitted, damage should be kept to a minimum, and compensatory measures should be provided. Measures to improve biodiversity value of sites and enhance their natural conservation interest and landscape quality including the establishment of local nature reserves will be supported.*

The Development Plan offers further clarification that this policy applies to locally important Wildlife Sites.

2.4.4 The Phase II mitigation area is included within land (Site 7, in total 9.5 hectares) allocated by the adopted Wrexham UDP for employment development between 2001 and 2011 (Policy E11).

2.5 Landscape

2.5.1 The Phase II mitigation area is located adjacent to Bryn Lane in the northeast sector of Wrexham Industrial Estate. Wrexham Landmap identifies the industrial estate as character area 11: Wrexham lowland urban (W/LC/11). In general the area is fairly low-lying as it is located near the edge of the River Dee flood-plain. Much of the site is surrounded by a variety of light manufacturing and industrial premises. The Phase II mitigation area includes a small area of Birch woodland, mature and scattered scrub, tall herb vegetation, and areas of unmanaged and unimproved neutral grassland. There are no buildings on the site.

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3 NATURE CONSERVATION FEATURES OF INTEREST

3.1 Identification and Confirmation of Conservation Features

Primary Conservation Features

Great Crested Newts

3.1.1 During surveys undertaken in 2007 and 2010 a maximum of fourteen Great Crested Newts has been recorded from the ditch to the west of the Phase II mitigation area. Furthermore a maximum of 30 Great Crested Newts has been recorded from the waterbodies within the Phase I mitigation area (in 2010). Egg-laying has taken place in all of these waterbodies. It should be noted that at the present time there is no aquatic habitat within the Phase II mitigation area (although three ponds are to be created).

3.1.2 Although relatively small numbers have been recorded from each waterbody they are likely to form part of a much larger meta-population that may be of at least national importance. There are at least an additional seventeen ponds/ other waterbodies within 500 m of the site, thirteen of which are known to support/ have supported Great Crested Newts. There is a particular concentration of past records to the east and northeast of the site (*Figure 5*). The distribution of Great Crested Newts in Wales is described in the Wrexham BAP (Wrexham County Borough 2003):

'*The number of ponds known to have Great Crested Newts in Wales is estimated to be in the region of 500. Of these over 400 are known to occur in North East Wales. Within North East Wales, 200 have been recorded in Wrexham; 160 in Flintshire, 55 in Denbighshire and 3 in Conwy*'.

3.1.3 If considered as a separate population, that supported by the ditch is small to medium size. It is clear from the results of surveys completed to date within the Phase I mitigation area that there is a significant opportunity to increase the number of Great Crested Newts using the area through appropriate habitat enhancement/ creation and management.

Secondary Conservation Features

Amphibians

3.1.4 This area supports large populations of Common Frog and Common Toad (although approximate population sizes are not known). The Phase I mitigation area/ ditch also supports a 'large' population of Smooth Newts. All three species are identified within the Wrexham BAP as Locally Important/Endangered Species. The Common Toad is a UK BAP priority species. The amphibian populations supported by the site can be considered to be possibly of county importance.

Breeding Birds

3.1.5 The proposed Phase II mitigation area supports a number of fairly widespread breeding passerines. These breeding birds are more-or-less restricted to areas of *Crataegus monogyna* (Hawthorn) scrub and the *Betula pendula* (Silver Birch)-dominated secondary woodland. Due to the extent of this habitat resource breeding density is notable. The Bullfinch, Reed Bunting and Song Thrush are all identified within the Wrexham BAP as

Locally Important/ Endangered Species and all three are UK BAP priority species. The latter species also has an associated Species Action Plan. The Dunnock is a UK BAP priority species. The breeding bird assemblage is of district value. The proposed Phase II mitigation area provides habitat that is suitable for a small number of breeding pairs of these species, and has the potential to support more should appropriate habitat be created. In the fullness of time it may be possible to identify a particular species for this feature, for example Bullfinch. Management for this species is likely to be of benefit to other scrub-nesting species such as the Dunnock. It will also help to achieve the objectives included in the Wrexham Species Action Plan.

Species-rich Neutral Grassland

3.1.6 The area of grassland in the northern part of the site is included within a County Wildlife Site and therefore by definition is of county importance. However it is a relatively small habitat fragment. Much of the existing grassland within the Phase II mitigation area is comparatively species-poor but with localised variation in the composition. The area of species-rich grassland supports a small number of locally scarce plants such as *Lathyrus nissolia* (Grass Vetchling). This area of grassland will be managed principally for floristic diversity and Great Crested Newts.

Scrub

3.1.7 The value of the scrub is largely associated with the breeding bird community it supports. This is detailed above.

Confirmed List of Conservation Features

3.1.8 The table below lists the features that will be the focus of the remaining planning process and indicates the conservation status of each species/ species group/ habitat.

Feature	International Status	National Status	Local Status
Great Crested Newt	✓	✓	✓
Amphibians (exc. Great Crested Newt)			✓
Breeding Birds			✓
Neutral Grassland			✓

4 OBJECTIVES AND MONITORING

4.1 Great Crested Newts

Summary Description

4.1.1 The Great Crested Newt is the largest of the three species of newt that are native to Britain. The British population is amongst the largest and by implication, important in Europe. As amphibians Great Crested Newts need aquatic habitat during the breeding period and terrestrial habitat for foraging (throughout the year) and hibernation.

Management Objective

4.1.2 The site will contain a suite of three ecologically complimentary ponds that provide a range of habitat conditions. The terrestrial habitat will be managed to provide suitable conditions for Great Crested Newts for foraging and shelter throughout the year. The terrestrial habitat will include woodland, patches of scrub, unmanaged grassland and infrequently managed grassland. The area of woodland will be maintained at its current extent, while scrub habitat will be increased through planting/ translocation.

4.1.3 Additional hibernacula will be provided for shelter/ hibernation. The aim of management will be to provide enhanced habitat capable of supporting Great Crested Newts throughout their life-cycle within the site. This will increase the number of Great Crested Newts using the site, and therefore provide a stabilised source to strengthen the local meta-population. A target population size for this objective will be set following the first two years of monitoring.

4.1.4 There should be no invasive non-native plant species or fish in any of the ponds.

Favourable Conservation Status

4.1.5 At present there is no aquatic habitat within the Phase II mitigation area but the adjacent ditch and Phase I mitigation area supports a medium size population. The site is close to a number of ponds that support Great Crested Newts. However with further development, fragmentation and isolation of such habitat is likely to increase. In addition, without appropriate management in the long-term many existing ponds may become unsuitable for the species. Such management cannot be secured unless appropriate ownership or lease arrangements can be confirmed.

4.1.6 As long-term data is unavailable it is not known whether this number is decreasing, being maintained or increasing. However, due to a combination of the factors above it is likely that the population supported by the site is not at Favourable Conservation Status (FCS). The Phase I mitigation area is likely to have contributed to the ongoing recovery of the local population. Further survey data will be required in order to define the FCS.

Monitoring

4.1.7 This section details monitoring projects both for the feature of interest (Great Crested Newt) and the factors that affect that feature.

4.1.8 A target will be set for the Great Crested Newt sub-population supported by the site following two years of monitoring and as by that time the newly created ponds will have established. The size of the sub-population of Great Crested Newts is likely to be at least partly indicative of the success of site management. It will also reflect the general condition of the habitat for other amphibians.

Great Crested Newt Monitoring			
Methodology	The survey will involve two visits in the prescribed years for an initial period of ten years. Each visit will involve a torch survey unless other techniques (*e.g.* bottle-trapping) are deemed necessary to obtain robust count data. During these survey visits the presence of Great Crested Newt eggs should be recorded at each pond. Surveys should not be undertaken if the air temperature is below 5°C and or the wind speed is greater than Beaufort Scale 3 and or there is heavy rain. A minimum of two counts is completed. Both of these visits should be undertaken between 10th April and 15th May. Torch surveys are undertaken using a 1.5 million candlelight power clu-lite torch. It involves shining the torch into the pond at night when newts are most active and therefore more visible. Bottle-trapping if required 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. Survey licence restrictions are placed on how long these traps are left in place principally for welfare considerations. CCW guidelines require traps to be set at metre intervals around the entire pond edge.		
Timing	**Where**	**Equipment**	**Estimated Cost**
Years 1, 2, 5 and 10; 2 visits each year. Mid-April to mid-May.	Ponds 1 to 3, Zone 2	Waders, Clu-lite torch, approx. 100 bottle-traps, head torch, survey form, water/ air thermometer, hand cleanser.	

4.1.9 The presence/ absence of fish and of non-native invasive plant species will be recorded through observation at the same time the Great Crested Newt monitoring visits are being completed. The proportion of open water and marginal/emergent vegetation at each pond should also be estimated by visual observation at this time.

Fish Monitoring			
Methodology	As GCN survey. Any fish seen during torch surveys, caught in bottle-traps or netted will be noted, with an estimate of numbers. Should any be detected this would precipitate the requirement for a management project (to remove the fish) to be added to this Management Plan.		
Timing	**Where**	**Equipment**	**Estimated Cost**
As GCN survey	Ponds 1 to 3, Zone 2	As GCN survey	

Non-native Invasive Plant Monitoring			
Methodology	Each pond will be visited while undertaking the monitoring of the Great Crested Newts and the presence/ absence of any non-native invasive plants noted. Should such a species be present then the extent will be estimated by visual observation as a proportion of the surface area of the pond. If helpful, the extent of vegetation can be hand drawn on a scale map of each pond. Should any be detected this would precipitate the requirement for a management project (to control the species) to be added to this Management Plan.		
Timing	**Where**	**Equipment**	**Estimated Cost**
Years 1, 2, 5 and 10. May/June.	Ponds 1 to 3, Zone 2	Clipboard, plan of ponds	

Marginal/Emergent Vegetation Monitoring			
Methodology	Each pond will be visited once every four years. The extent of the marginal/emergent vegetation will be estimated by visual observation as a proportion of the surface area of the pond. If helpful, the extent of vegetation can be hand-drawn on a scale map of each pond.		
Timing	**Where**	**Equipment**	**Estimated Cost**
Every four years. May/ June.	Ponds 1 to 3, Zone 2	Clipboard, plan of ponds	

4.2 Amphibians

Summary Description

4.2.1 Three of the four widespread British amphibian species are present on the site; the Common Frog, Common Toad and Smooth Newt. All three species will be familiar to many people. As with the Great Crested Newt, terrestrial habitat as well as aquatic breeding habitat is important for these species.

Management Objective

4.2.2 It is considered likely that the management undertaken for Great Crested Newts will for the most part be beneficial for these species.

Favourable Conservation Status

4.2.3 The size of the Common Frog and Common Toad populations supported by the site appears to be large although no specific data is available. The site supports a medium size population of Smooth Newts. No data is available for populations of these three species in the surrounding area. However as there are a large number of ponds/ waterbodies located within 500 m of the site these three species are likely to be frequent throughout this area. In parallel with Great Crested Newts the Favourable Conservation Status of these amphibians will be affected by habitat fragmentation and degradation, development, and in the long-term absence of positive management.

4.2.4 As long-term data is unavailable it is not known whether the populations of these three species are decreasing, being maintained or increasing. It is not possible to determine Favourable Conservation Status (FCS) without further survey data.

Monitoring

4.2.5 In order to obtain an indication of how other amphibians are doing at the site it is proposed to monitor the Smooth Newt population as data can be collected at the same time as undertaking the Great Crested Newt survey visits. The target number for the maximum count of Smooth Newts on the site will be set following two years of monitoring and when the ponds have established.

Smooth Newt Monitoring			
Methodology	As GCN survey.		
Timing	**Where**	**Equipment**	**Estimated Cost**
As GCN survey.	As GCN survey.	As GCN survey.	

4.3 Breeding Birds

Summary Description

4.3.1 The site is used by a number of breeding birds that prefer areas of dense scrub and open woodland *e.g.* Song Thrush and Bullfinch. The Bullfinch is a familiar bird in gardens, woods and hedgerows. One or more species of bird will be identified in the future as a valuable feature of the site and the following management amended accordingly. This species is likely to be a scrub-nester to focus appropriate management.

Management Objective

4.3.2 The site will be managed to provide potential nesting habitat for birds that prefer woodland and scrub, such as the Bullfinch. The area of woodland will be maintained at its current extent, while scrub habitat will be increased by approximately 0.42 hectares. Enhancement measures are likely to include the provision of a number of regularly maintained bird-boxes.

4.3.3 The area of scrub will be increased through planting and once established will be maintained on a long-term rotation.

Favourable Conservation Status

4.3.4 At present the size of the Bullfinch population on the site is around 1 to 2 pairs, with one pair in the Phase II mitigation area. Due to the size of the site it is unlikely that the Phase II mitigation area would ever support more than one pair.

4.3.5 As long-term data is unavailable it is not known whether the number of Bullfinch or other key breeding species is decreasing, being maintained or increasing. One pair of Bullfinch have bred within/ adjacent to the Phase II mitigation area. It is therefore assumed that the site Favourable Conservation Status of one pair of Bullfinch is being maintained.

Monitoring

4.3.6 Once a key species has been selected and two years of monitoring has been completed the target population size can be set. Territory-holding birds will be monitored through visiting the site twice between April and July every two years. The visits will be conducted within 2.5 hours of sunset or sunrise and will involve mapping all individuals, particularly singing birds.

Breeding Bird Monitoring			
Methodology	The site will be visited within 2.5 hours of sunset or sunrise. All registrations of key species (*e.g.* Song Thrush, Bullfinch, Reed Bunting) will be recorded and mapped over the existing Phase I Habitat Map. The visits will concentrate on locating birds that are holding territory or are nesting. This survey would use the British Trust for Ornithology's (BTO) Common Bird Census technique (Marchant 1983[8]).		
Timing	**Where**	**Equipment**	**Estimated Cost**
April to July, two visits, every two years.	Throughout site.	Phase I Habitat Map, clipboard, pencil.	

4.4 Neutral Grassland

Summary Description

4.4.1 Species-rich neutral grassland is identified as a feature of the Wrexham Industrial Estate Wildlife Site. This grassland is largely unmanaged other than limited grazing by Rabbits. Within the Phase II mitigation area it supports Grass Vetchling (*Lathyrus nissolia*); a locally scarce species of plant. As such Grass Vetchling is proposed as an indicator of the overall health of the habitat.

Management Objective

4.4.2 Zone 1 will largely be managed to maintain species-rich neutral grassland of varying lengths, with scattered scrub. This will be achieved through infrequent mowing and control of scrub where necessary. It will initially involve clearance of scrub (particularly Bramble) and tall-herbs to reinstate a grassland sward. Management will then seek to create a sward of low to moderate height (10-50 cm) with some bare patches. Ideally it should maintain the population of Grass Vetchling, and hopefully facilitate an increase.

4.4.3 The species-rich grassland within Zone 1 (and possibly Zone 2) should continue to support the locally scarce plant Grass Vetchling.

Favourable Conservation Status

4.4.4 If the grassland remains unmanaged, the sward will gradually be colonised by coarse-leaved grasses such as *Arrhenatherum elatius* (False Oat-grass) and *Dactylis glomerata* (Cock's-foot) and/or be subject to scrub invasion. This will reduce the species richness and locally scarce plants may be lost from this area. The species-richness of the grassland will also be affected by the continued absence of positive management in the medium to long-term.

[8] Marchant, J.H. (1983). *BTO Common Bird Census Instructions*. British Trust for Ornithology, Tring.

although habitat fragmentation, degradation and development will also negatively affect this resource.

4.4.5 At present there is little detailed information regarding the size of the Grass Vetchling population on site. As long-term data is not available, it is not known whether the population size is decreasing, being maintained, or increasing. However as scrub and tall-herbs are colonising the areas of grassland and there is no active management it is possible that the size of the population may be declining and therefore the FCS is not being maintained. Without information regarding the status of the species in the area it is not possible at this stage to define the FCS.

Monitoring

4.4.6 Grass Vetchling should remain present within Zone 1. Ideally the spread of the population should increase within Zone 1 and possibly to Zone 2.

Grass Vetchling Monitoring			
Methodology	Presence/ absence of Grass Vetchling should be recorded in Zones 1 and 2. The approximate distribution of Grass Vetchling should be mapped over the existing Phase I Habitat Map. An estimate of the area covered and density of the population should be made, and whether it is increasing or decreasing. This survey must be undertaken when Grass Vetchling is in flower due to the difficulty of locating the plant otherwise.		
Timing	**Where**	**Equipment**	**Estimated Cost**
Every two years. First half of June.	Zones 1 and 2.	Phase I Habitat Map, clipboard, ruler, pencil.	

4.4.7 The areas of scrub, short and long grassland within Zone 1 will be assessed during June by visual observation. The sward length could be briefly measured to aid this assessment. This monitoring can be conducted at the same time as monitoring of Grass Vetchling. At the present time the areas covered by scrub and grassland within Zones 1 and 2 are not known. These areas should be defined following the start of this monitoring. However it is suggested that a minimum of 75% of Zone 1 is retained as grassland and Zone 2 contains approximately 50% scrub, 50% grassland.

Scrub and Grassland Monitoring			
Methodology	This monitoring work should be undertaken at the same time as the monitoring of Grass Vetchling. The approximate area of grassland habitat should be mapped over the existing Phase I Habitat Map. An estimate of the area covered by this habitat (separately for Zones 1 and 2) should be made, and whether it is increasing or decreasing.		
Timing	**Where**	**Equipment**	**Estimated Cost**
Every two years. June.	Zones 1 and 2.	Phase I Habitat Map, clipboard, ruler, pencil.	

5 MANAGEMENT PROJECTS

Great Crested Newts and Other Amphibians

SCRUB MANAGEMENT					
Methodology	Most scrub will be removed from areas of grassland, but a small amount will be tolerated around the ponds (<20% shrub cover round ponds).				
Purpose	**Timing**	**Programme**	**Where?**	**Equipment**	**Estimated cost**
Scrub colonisation of areas of grassland will be controlled to maintain the open nature of the grassland. However small amounts of scrub in these areas may be tolerated; some shading of pond margins is preferred by adult newts.	Oct to Nov, 1 day	Year 4, 8, 12, 16, etc	Zones 1 and 2	Bow-saws, Loppers, bill-hooks, gloves.	

GRASSLAND MANAGEMENT					
Methodology	The grassland within Zone 2 should be subject to limited intervention. It will remain uncut although the requirement for infrequent cutting will be reviewed in future years. Scrub within the existing areas of grassland will be controlled as detailed above.				
Purpose	**Timing**	**Programme**	**Where?**	**Equipment**	**Estimated cost**
Effective grassland management for Great Crested Newts will result in the creation and maintenance of a diverse structure throughout the site.	End of June/ July in hot/dry conditions (If a cut is required).	To be defined.	Zone 2	-	

POND MANAGEMENT	
Methodology	Undertake periodic (possibly every two to four years) clearance of marginal vegetation at all ponds in autumn/ winter by hand digging. Where possible clear the advancing front face of some beds of emergent plants, so maintaining stable conditions on the landward interface, and cut others in bands from water to land. To be effective emergent plants must be removed 'roots and all' otherwise rapid re-growth will occur. Digging out may be effective over small areas but for larger jobs careful use of an excavator may be required. The frequency of this management operation will be informed by the monitoring. Retain floating-leaved plants across at most half of the pond's surface. Removal should be undertaken in autumn/winter if possible but may be required in summer when aquatic plants are most abundant. If removal is required in the summer it should be completed in late-summer, outside the newt breeding season. All vegetation material should be checked for newts and left near the pond for at least 24 hours before composting. Reduction of floating and submerged plants can be done using a long-handled rake. Some species can recover after a year or two and so this may be a bi-annual task. Removing plants during the newt egg-laying period (late March to end of June) must be avoided. There may be algal blooms in the first few years of the new ponds until submerged rooted plants are well established. If growth is excessive remove some but do not remove all filamentous algae as it is good cover for invertebrates. If required, early spring application of barley straw at 1 bale per hectare, assuming a 1 m depth can inhibit algal growth.

Purpose	Timing	Programme	Where	Equipment	Estimated cost
To provide diverse aquatic and emergent vegetation communities, with substantial amounts of plant material available that is suitable for egg-laying.	Late Oct to Nov. 1-2 days. Spring treatment of algae.	No more than one-third of each pond should be managed in any one year. Clearance to be undertaken as required.	Ponds 1 to 3, Zone 2	Spade, Long-handled rake, wheel-barrow	

POND MANAGEMENT						
Methodology	Dredging should be avoided wherever possible. Only one-third of each pond should be dredged in any one year and no more than the equivalent of three to four JCB bucket sizes should be removed within any one year. Dredging should therefore be completed over a three-year period. Dredged spoil should be disposed of away from the ponds although it should be stored overnight adjacent to the pond to allow any animals to crawl back in. Dredging should be completed in autumn/winter. The water levels should be closely monitored in the first two years to confirm whether the pond design achieves the desired depth profile. If required some re-sculpting of the pond edges and depths could be carried out in the second year.					
Purpose		**Timing**	**Programme**	**Where**	**Equipment**	**Estimated cost**
Dredging/ de-silting of all of the ponds may be required in the long-term to ensure that the habitat quality is maintained. However, if the siltation rate is low, this operation may only be required approximately once every 15-20 years.		Late Oct to Nov.	Re-profiling may be required in Year 2. Year 15 for dredging, or as required. 3 days over 3 years for each pond.	Ponds 1-3, Zone 2.	Ten-tonne tracked excavator with a hinged arm or similar.	

Breeding Birds

WOODLAND MANAGEMENT					
Methodology	Ten bird-boxes of appropriate designs should be constructed and erected in the woodland and existing mature scrub. All bird-boxes will be checked and cleaned outside the breeding season. Boxes should be sited out of reach, 3m or more off the ground. In open locations it is generally best if the hole faces south-east to avoid the worst of the weather. They should not be placed in direct sunlight where possible. All boxes should be cleaned annually in the autumn (October) as they can be heavily infested with parasites. Allow at least 2 to 3 weeks after fledging before cleaning. The *Wildlife and Countryside Act 1981* states that cleaning should only be carried out between 1st August and 31st January and that any eggs present should be destroyed immediately. All nest material should be completely removed and disposed of safely. The bird-box should then be cleaned with boiling water to remove parasites. The woodland within Zone 4 should otherwise be subject to non-intervention.				
Purpose	**Timing**	**Programme**	**Where**	**Equipment**	**Estimated cost**
Nest-boxes will be provided in the woodland and in the existing areas of scrub. Nesting opportunities are currently limited in the woodland due to the young age of the trees and therefore lack of suitable holes and other features. A variety of nest-boxes will be provided so as not to favour hole-nesting species.	Jan/Feb. October annually for cleaning.	Zones 2 & 4 - Year 1. Annually for cleaning.	Zone 2, Zone 4	Ladder, hammer, nails, wire. Gloves for cleaning nest-boxes.	

SCRUB MANAGEMENT					
Methodology	Coppice/ clear approximately 15% of the scrub in any one year on a 15-20 year cycle. This scrub may be cleared using hand-tools and is ideal for volunteer work parties. The work should not be undertaken in cold weather to avoid disturbing hibernating newts. Cut logs can be stacked in Zone 2 or 3 to provide refuges for newts. The first year that this management is undertaken will depend on the success of establishment of the planted scrub and therefore the size of the individual shrubs. The mature specimens that are to be translocated into this area should not be coppiced.				
Purpose	**Timing**	**Programme**	**Where?**	**Equipment**	**Estimated cost**
To maintain areas of dense scrub for hibernating/ foraging newts and breeding birds.	Oct to Nov, 1 day.	Year 15-20, Year 30-40.	Zone 3	Bow-saws, Loppers, bill-hooks, gloves.	

SCRUB MANAGEMENT					
Methodology	The existing mature scrub within Zone 2 should be subject to non-intervention. The requirement for any management in the future should be subject to review and an appropriate management project inserted in this plan at that time.				
Purpose	**Timing**	**Programme**	**Where?**	**Equipment**	**Estimated cost**
To maintain areas of dense scrub for hibernating/ foraging newts and breeding birds.	-	-	Zone 2	-	-

Neutral Grassland

GRASSLAND MANAGEMENT					
Methodology	In the first year remove areas of *Rubus fruticosus* agg. (Bramble) and stands of tall herbs from main area of grassland. Subsequently cut all of the grassland area once a year. The cutting blade should be set at a height of about 10 cm. Should the mower not create any bare patches/ cause any disturbance it may be necessary to do this by other means. A fork or similar tool could be used to create a series of bare areas throughout Zone 1. The grass cuttings should be left in-situ and then raked off after 24 hours. Grass heaps can be created beneath trees/ by scrub in Zone 1 or Zone 2. The heap should be constructed over a base of criss-crossed coarse material such as branches or logs. Ideally the grass would be mixed with fine woody material. The requirement to change the cutting frequency (*e.g.* should more than one annual cut be required to maintain the interest of the grassland) should be subject to review and an appropriate management project inserted in this plan at that time if required.				
Purpose	**Timing**	**Programme**	**Where**	**Equipment**	**Estimated cost**
The purpose of positive management of the area of species-rich grassland within the Zone 1 is to maintain/ enhance the grassland community including the population of Grass Vetchling. Grass heaps may provide a suitable egg-laying site for Grass Snakes.	September/ October, ideally in warm/dry conditions.	Annual.	Zone 1.	Rakes, Fork, Wheel-barrows, Gloves, Mower with reciprocating blade.	

GRASSLAND MANAGEMENT					
Methodology	All litter should be removed from all areas of the site at least once a year and disposed of at the adjacent Waste Recycling and Composting Facility. Should any newts be found during this clearance the item should be left in place. In addition if it is thought that the item may provide a useful refuge it may be left.				
Purpose	**Timing**	**Programme**	**Where**	**Equipment**	**Estimated cost**
To provide a well-kept and 'looked after' appearance.	Oct-Jan from ponds, June to July & Oct for terrestrial habitat.	Annual.	All zones	Gloves, bin-bags	

6 OPERATIONAL OBJECTIVES

6.1.1 Operational objectives are listed to ensure legal and any other site obligations are met:

- The existing fence will be maintained in order to reduce uncontrolled access to the site. This will require an annual inspection and maintenance operations will be completed as required.
- The managing body will liaise with WRG as appropriate.
- The managing body will comply with all legal obligations, particularly in respect of Great Crested Newts as detailed in the preceding sections. Nearly all management operations on the site will require an appropriate licence to be considered lawful.
- An annual meeting will be convened to review work undertaken at the site each year. Attendees will include WRG, the managing body and CCW if appropriate. In addition to annual review of the monitoring and management work undertaken the efficacy of the Management Plan will be reviewed. Management prescriptions will be adapted accordingly. The current Management Plan will be fully reviewed after the second year and every fifth year thereafter. If required an updated Management Plan will be implemented the year following the review. The reviews will take into account all required revisions and assess the findings of the monitoring programme.
- A brief report will be prepared for discussion at the annual meeting by the managing body. The report will provide the results of all monitoring undertaken in that year, and review the success or otherwise of management.

7 ACTION PLAN

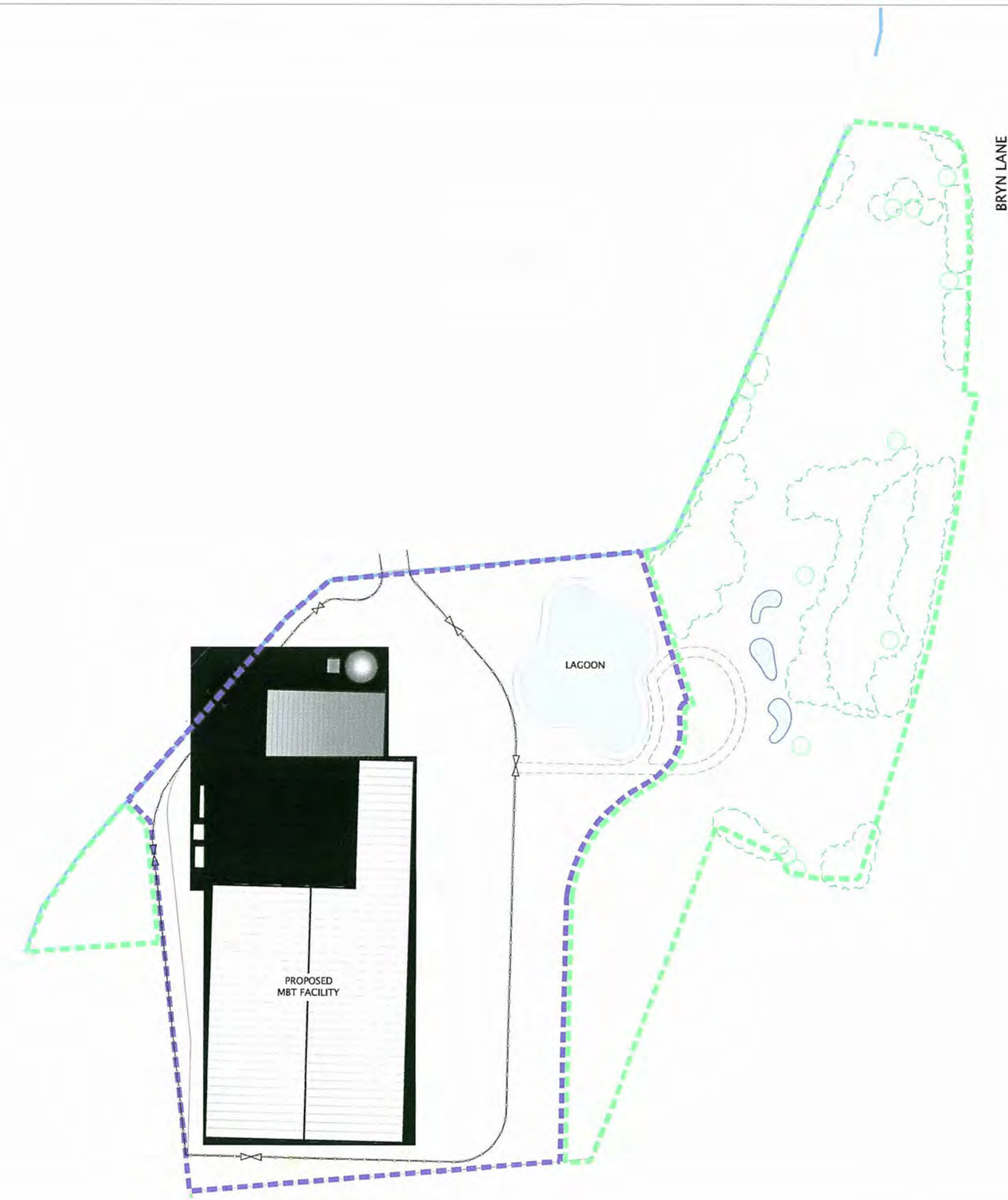
Task	Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
Great Crested Newts and Other Amphibians					
Remove scrub from areas of grassland in Zones 1 & 2				Oct-Nov	
Grassland in Zone 2: limited intervention					
Control marginal vegetation in ponds in Zone 2				Oct-Nov	
Dredge ponds in Zone 2 on long-term rotation					
Breeding Birds					
Erect & maintain bird-boxes in Zones 2 & 4	Jan/ Feb to erect Oct to clean	Oct to clean	Oct to clean	Oct to clean	Oct to clean
Coppice/ clear scrub in Zone 3 on a long-term rotation					
Scrub in Zone 2: non-intervention					
Neutral Grassland					
Cut grass in Zone 1 once a year	Sept/ Oct	Sept/ Oct	Sept/ Oct	Sept/ Oct	Sept/ Oct
Clear litter in all zones once a year	Oct-Jan from ponds, June to July & Oct for terrestrial habitat.	Oct-Jan from ponds, June to July & Oct for terrestrial habitat.	Oct-Jan from ponds, June to July & Oct for terrestrial habitat.	Oct-Jan from ponds, June to July & Oct for terrestrial habitat.	Oct-Jan from ponds, June to July & Oct for terrestrial habitat.
Monitoring					
Great Crested Newt monitoring Zone 2	Mid-Apr to Mid-May	Mid-Apr to Mid-May			Mid-Apr to Mid-May
Fish monitoring Zone 2	Mid-Apr to Mid-May	Mid-Apr to Mid-May			Mid-Apr to Mid-May
Non-native invasive plant monitoring Zone 2	May/ June	May/ June			May/ June
Marginal/ emergent vegetation monitoring Zone 2				May/ June	
Smooth Newt monitoring Zone 2	Mid-Apr to Mid-May	Mid-Apr to Mid-May			Mid-Apr to Mid-May
Breeding bird monitoring in all zones	Apr-Jul		Apr-Jul		Apr-Jul
Grass Vetchling monitoring in Zones 1 and 2	First half of June		First half of June		First half of June
Scrub and grassland monitoring in Zones 1 and 2	June		June		June

Task	Year				
	Year 1	Year 2	Year 3	Year 4	Year 5
Operational Objectives					
Inspect boundary fence once a year					
Annual meeting	Dec	Dec	Dec	Dec	Dec
Annual report	Nov	Nov	Nov	Nov	Nov
Review current Management Plan					

8 PROJECT RECORDING AND REVIEW

8.1.1 An annual report covering the results of all of the monitoring and management undertaken in that year will be prepared by the managing body and submitted for review by Waste Recycling Group and CCW if appropriate in November of each year. This report and the associated meeting in each December will form the main component of the review process. The main purpose of this meeting will be to ensure that the site is being managed in accordance with the approved Management Plan. Compilation of the report will require records to be maintained throughout the year.

8.1.2 The Management Plan will be reviewed after two years when the created habitats have stabilised, and then subsequently every five years thereafter.



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KEY

- PROPOSED DEVELOPMENT SITE BOUNDARY
- PHASE 2 MITIGATION AREA BOUNDARY

REV.	DESCRIPTION	DATE

stratus environmental

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CLIENT

Marches Ecology

PROJECT

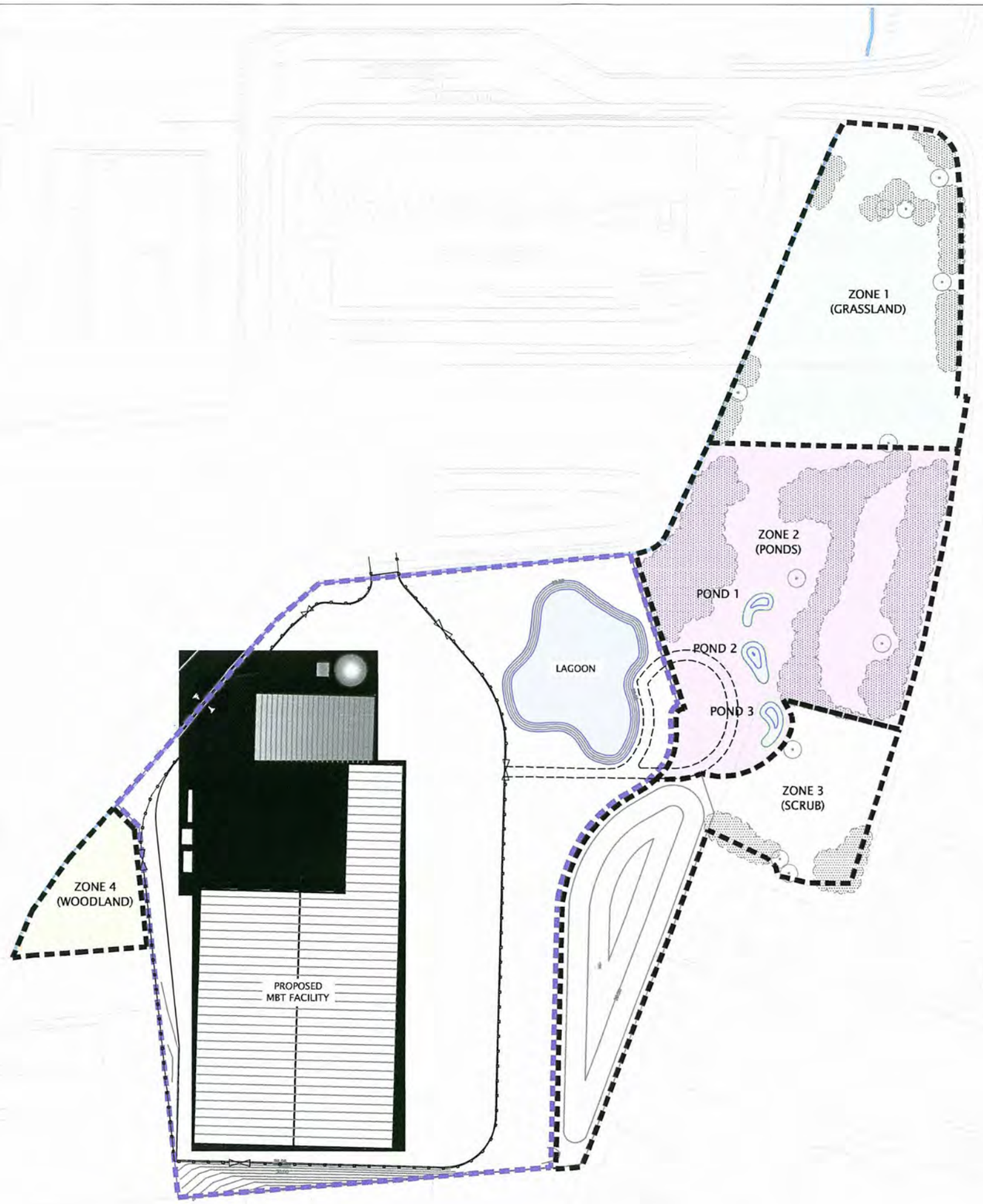
BRYN LANE
POST SUBMISSION

DRAWING TITLE

LOCATION OF PHASE 2
MITIGATION AREA

DRAWN	DATE	APPROVED	DATE
I.W	25/11/11	D.B	25/11/11

SCALE	SHEET	DRAWING NO.	REVISION
N.T.S	A3	FIGURE 1	0



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KEY

DEVELOPMENT SITE BOUNDARY

ZONE 1 – GRASSLAND: CUT BACK
AREAS OF BRAMBLE/TALL HERBS, CUT
GRASSLAND ONCE A YEAR & REMOVE CUTTINGS

ZONE 2 – SCRUB: NON-INTERVENTION
GRASSLAND: LIMITED INTERVENTION
PONDS: MANAGEMENT OF VEGETATION &
LONG -TERM ROTATIONAL CLEARANCE

ZONE 3 – SCRUB: COPPICE ON LONG-TREM ROTATION,
RETAIN TRANSLOCATED MATURE SPECIMENS

ZONE 4 – WOODLAND: ERECT BIRD BOXES AND
NON-INTERVENTION

REV.	DESCRIPTION	DATE

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Marches Ecology

PROJECT

BRYN LANE
POST SUBMISSION

DRAWING TITLE

MANAGEMENT ZONES &
SUMMARY MANAGEMENT
PROPOSALS

DRAWN	DATE	APPROVED	DATE
I.W	28/11/11	D.B	28/11/11

SCALE	SHEET	DRAWING NO.	REVISION
N.T.S	A3	FIGURE 2	0

Key

- PHASE 1 BOUNDARY LINE
- PHASE 1 AREA OF COMPLETED WORKS
- PHASE 2 BOUNDARY LINE
- UNIMPROVED NEUTRAL GRASSLAND
- A — AMENITY GRASSLAND
- TALL-RUDERAL VEGETATION
- AMENITY PLANTING
- BROAD LEAVED TREE (INDICATIVE ONLY)
- BROAD LEAVED SEMI-NATURAL WOODLAND
- CONTINUOUS SCRUB
- XXX SCATTERED SCRUB
- RUNNING WATER
- FENCE LINE
- BUILDINGS

Ag = Alnus glutinosa
Bpe = Betula pendula
Cm = Crataegus monogyna
Pop = Populus sp
Ps = Prunus spinosa
Qr = Quercus robur
Rf = Rubus fruticosus agg
Sxci = Salix cinerea
Ud = Urtica dioica

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Marches Ecology

NOTES

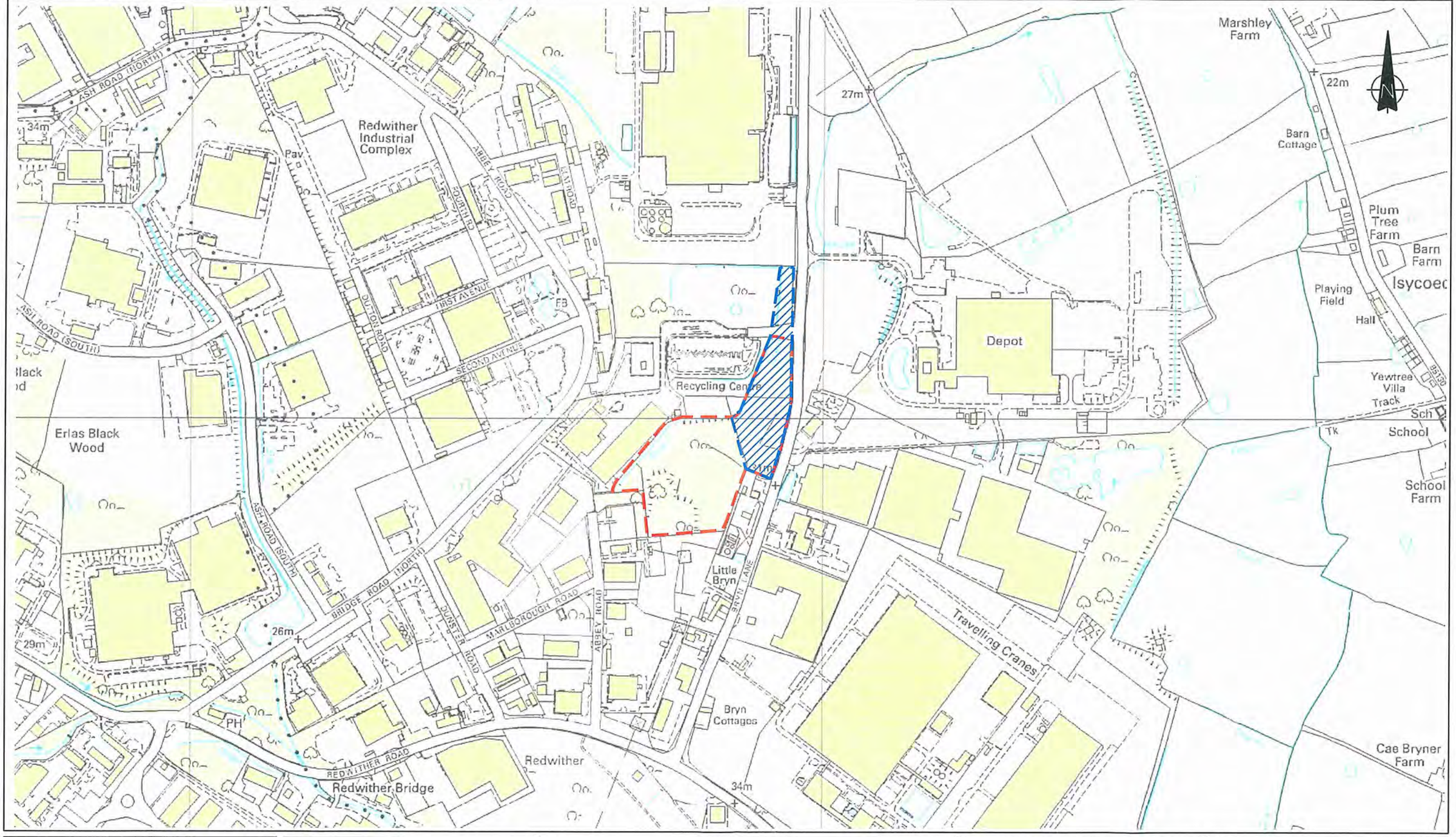
REV	DESCRIPTION	DATE	BY

JOB TITLE: BRYN LANE POST SUBMISSION

DRAWING TITLE: PHASE 1 HABITAT MAP

DRAWN	DATE	APPROVED	DATE
I.W	25/11/2011	D.B	25/11/2011

SCALE	SHEET	DRAWING NUMBER	REVISION
1:2000	A3	FIGURE 3	0



Marches Ecology

NOTES

KEY

Wrexham Industrial Estate Wildlife Site (W337)

Approximate Location of Survey Site

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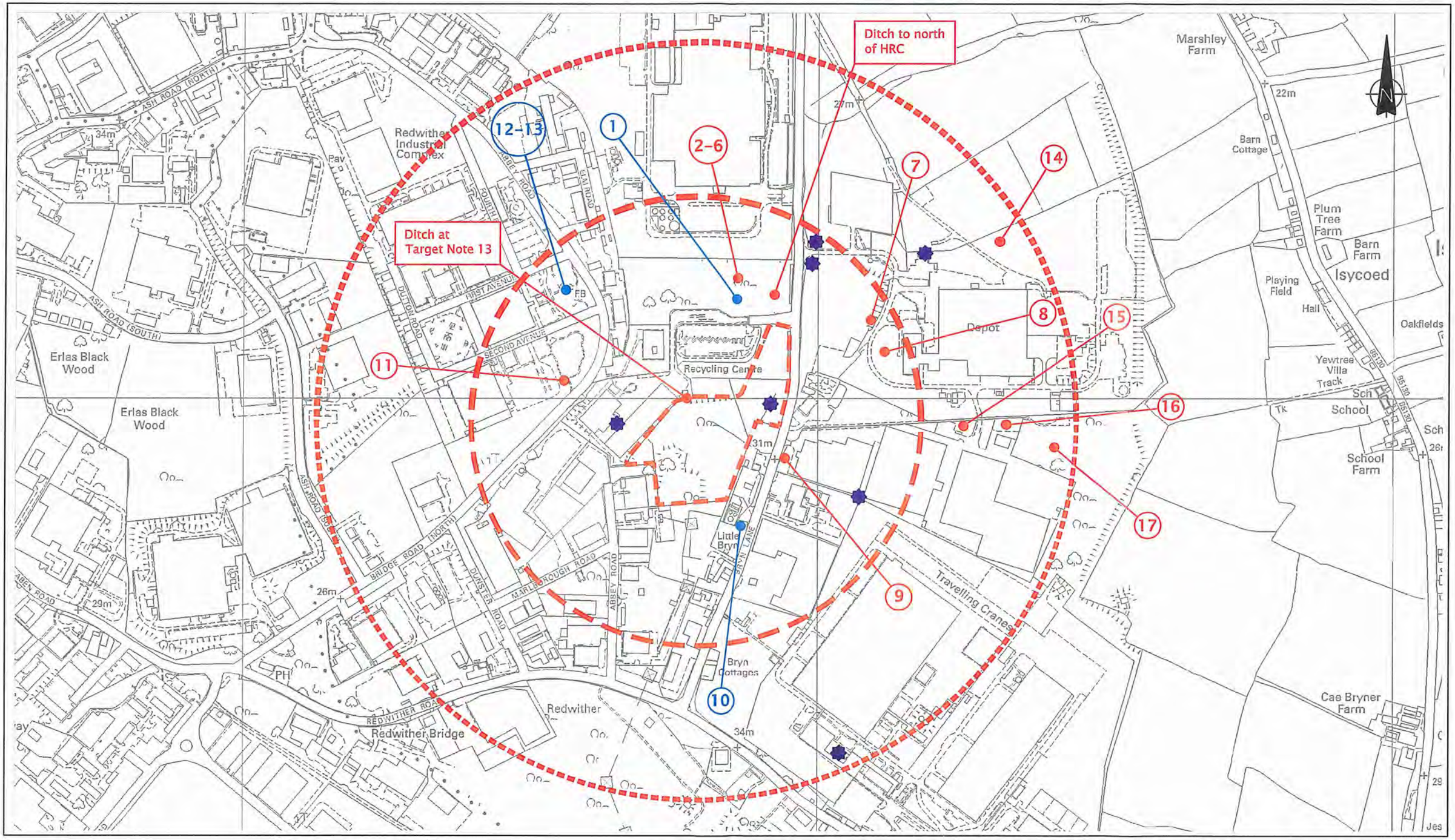
REV	DESCRIPTION	DATE	BY

JOB TITLE: BRYN LANE POST SUBMISSION

DRAWING TITLE: LOCATION OF WREXHAM INDUSTRIAL ESTATE WILDLIFE SITE (W337) AT BRYN LANE

DRAWN	DATE	APPROVED	DATE
I.W	25/11/2011	D.B	25/11/2011

SCALE	SHEET	DRAWING NUMBER	REVISION
NTS	A4	FIGURE 4	0



Marches Ecology

NOTES

KEY

- Pond Location (GCN Record)
- Pond Location (No GCN Record)
- Other GCN record (All GCN records provided by CCW or from previous Marches Ecology surveys)
- Approximate 500m boundary
- Approximate 250m boundary

Pond 11 = Isringhausen pond; 12 & 13 = Redwither Tower

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REV	DESCRIPTION	DATE	BY

JOB TITLE: BRYN LANE POST SUBMISSION

DRAWING TITLE: GREAT CRESTED NEWT RECORDS AROUND THE SITE

DRAWN	DATE	APPROVED	DATE
I.W	25/11/2011	D.B	25/11/2011

SCALE	SHEET	DRAWING NUMBER	REVISION
NTS	A4	FIGURE 5	0

APPENDIX 1

PLAN

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KEY

- PLANNING PERMISSION BOUNDARY REF: P/2011/0769
- MITIGATION AREA
- EXISTING GROUND CONTOURS

SECOND AVENUE

BRIDGE ROAD (NORTH)

BRYN LANE

Electric Cable Markers

REV	DESCRIPTION	DATE	BY

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CLIENT

waste recycling GROUP

BRYN LANE PHASE 2
PLANNING APPLICATION

SECTION 106 AGREEMENT PLAN

S.T	21/12/2011	D.B	21/12/2011
1:1000	A1	WR7042/19/18	0

EXECUTED AS A DEED by affixing the)

COMMON SEAL OF WREXHAM COUNTY)
BOROUGH COUNCIL)
in the presence of:)

28/12

~~**Chief Legal and Democratic Services Officer**~~
Head of Corporate + Customer Services pp.

EXECUTED AS A DEED (but not)
delivered until the date hereof)
by WRG WREXHAM PFI LIMITED)
acting by:)

Director

~~**Director /**~~ **Secretary**