
Land off Sandy Lane, Higher Kinnerton

DRAFT Great Crested Newt Development Licence Method Statement

Compiled by Ecology Services Ltd.

on behalf of

Stewart Milne Homes NW England Ltd.

July 2019



Environmental Consultants

1 Church Row Chambers
Longton
Preston
Lancashire
PR4 5PN

Ref. number: 19066
Written by: LR
Checked: LES
Approved: LES

tel: 01772 614932
fax: 01772 614930
email: info@ecologyservices.co.uk
web: www.ecologyservices.co.uk

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Site Address:	Land off Sandy Lane, Higher Kinnerton

A. Executive Summary

The site comprises an area of land off Sandy Lane, Higher Kinnerton, Flintshire, CH4 9DZ, National Grid Reference (NGR) 333381, 361536 at centre. See Figure 2, Pond location plan.

The development site predominantly comprises of species-poor, semi-improved grassland managed by cutting bounded by species-rich hedgerows and fences and containing two ponds. The development site is located on the north easterly boundary of the village of Higher Kinnerton bisected by Sandy Lane. Land surrounding the site comprises of residential housing of Higher Kinnerton and agricultural land, consisting of both cropland and pasture, linked by a network of hedgerows and dry ditches. A dismantled railway line lies to the south-east. Amphibian surveys undertaken at the site in 2018 identified the presence of a small population of great crested newt (*Triturus cristatus*).

The site is proposed for residential development with associated infrastructure and landscaping. The two ponds within the development site will be retained and enhanced along with the majority of the boundary hedgerows but there will be loss of low quality terrestrial habitat (species-poor, semi-improved grassland).

To minimise impacts on great crested newts and maintain favourable conservation status at the site, a minimum of 30 days trapping and relocation of great crested newts will be implemented along with retention, enhancement and creation of good quality terrestrial habitat for great crested newts maintaining habitat connectivity with the wider countryside.

The permanent loss of 3.78ha poor quality terrestrial habitat is considered to be compensated by the enhancements of both Ponds 1 and 2 and retained grassland areas, the creation of hedgerows along the boundaries of the site which will enhance connectivity, scrub planting and the creation of six hibernacula providing hibernation habitat on site which is currently absent. SUDS areas have potential to provide additional habitat (terrestrial and aquatic) for great crested newts and amenity grassland areas will provide some foraging potential. The development site will be traversable to great crested newt and, over time, the residential gardens will be used by great crested newt, although there is no guarantee on the quality of this habitat.

The site will be subject to a long-term management agreement and presence/absence monitoring surveys for two years.

The works to be covered by the licence include:

- The installation of exclusion and drift fencing, trapping and relocation of great crested newts from the development footprint to a receptor site outside of the works area;
- Destruction of low quality terrestrial habitat; and
- Landscaping including habitat enhancement to both ponds and retained grassland and habitat creation including hedgerow creation, scrub planting and hibernacula.

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Background and Supporting Information

B. Introduction

B.1 Background to activity/development

The site is proposed for residential development comprising 107 residential dwellings with associated infrastructure and landscaping. The two ponds within the development site will be retained along with the majority of the boundary hedgerows but there will be loss of low quality terrestrial habitat. The proposals include the retention, enhancement and creation of good quality terrestrial habitat for great crested newts (*Triturus cristatus*).

Flintshire County Council is currently unable to demonstrate a five year housing supply, as required by Planning Policy Wales (PPW), and this situation is unlikely to be rectified until July 2021, at the earliest on adoption of the emerging Flintshire Local Development Plan.

The importance of housing delivery is reflected in the Welsh Government's National Housing Strategy, and the National Strategy "Prosperity for All" and in the key issues for active and social place making, highlighted in PPW.

The proposed development provides the opportunity to deliver additional dwellings for the local community in the short term, in support of the aims of the National Housing Strategy, Prosperity for All and PPW.

B.2 Full details of proposed works on site that are to be covered by the licence

The site is subject of planning permission for the construction of 107 residential properties plus associated infrastructure and landscaping with all relevant conditions discharged (TBC).

The works to be covered by the licence include:

- The installation of exclusion and drift fencing, trapping and relocation of great crested newts from the development footprint to a receptor site outside of the works area;
- Destruction of low quality terrestrial habitat; and
- Landscaping including habitat enhancement and habitat creation.

A draft timetable of works is included at Section G. The grassland within the receptor areas will be allowed to grow up in advance of commencement of trapping to provide suitable cover for great crested newts. Scrub and native species hedgerows within the receptor area will also be planted during the planting season prior to commencement of trapping and relocation along with creation of artificial hibernacula. Construction will only commence following successful completion of the trapping and relocation of great crested newts out of the development area. Further areas of terrestrial habitat for the great crested newt population will be made available on completion of the development and removal of the exclusion fencing.

B.3 Actions requiring licensing

The above proposed works will require the disturbance, capture and relocation of great crested newts and destruction of low quality terrestrial habitat (resting place). The two ponds within the site will be retained. The actions are required to enable development of the site for residential homes in support of the aims of the National Housing Strategy, Prosperity for All and PPW, whilst maintaining the favourable conservation status of the species at the site.

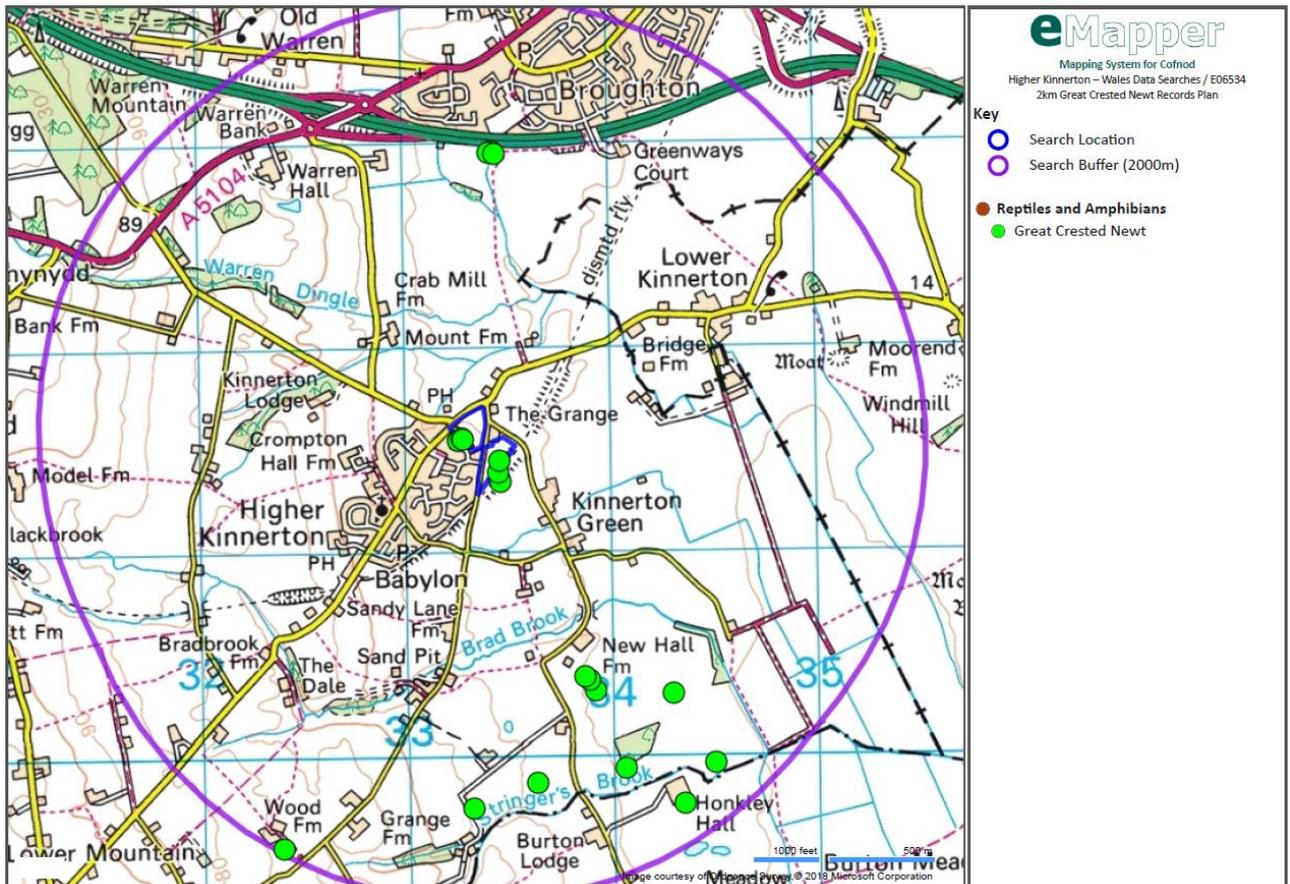
C. Survey and site assessment

C.1 Existing information on great crested newts at the survey site.

COFNOD - North Wales Environmental Information Service

The desktop study undertaken in June 2018 found records of great crested newt, common toad (*Bufo bufo*), smooth newt (*Lissotriton vulgaris*) and common frog (*Rana temporaria*) within 2km of the development site.

A total of seventeen records of great crested newt records were found. Several were located in the residential housing development to the south of Area B possibly in association with Pond 1, with several records off Sandy Lane to the south east of Area A, it is expected that these are associated with Pond 2. There were further records to the south of Broughton to the north and a cluster of records to the south of Higher Kinnerton.



Predictive Modelling

Over recent years, Amphibian and Reptile Conservation (ARC), in conjunction with Natural Resources Wales (NRW) and its predecessor body, have developed such a model for great crested newts in north Wales, including Flintshire.

The predictive model has been used to create habitat suitability and habitat value. The maps created show that the site falls within an area of high habitat suitability and an area of low/moderate habitat value.

Land with "Moderate" value is outside the core range, although the habitat may be suitable and there is a possibility of great crested newts being present. If great crested newt populations are present, they may have some intrinsic value although are less likely to be of significant value at a landscape level. They may, however, be important in contributing to the

maintenance of the overall range of the species. The lower density of ponds within these areas means there is less chance of populations with a high CCS occurring and therefore significantly contributing to achieving FCS at the county level. Consequently, development within these areas is less likely to be constrained by the presence of great crested newts and where it is, mitigation is likely to be less complex.

Land with “Low” and “Negligible” value is outside the core range and the habitat is of low suitability for great crested newts. Therefore, there is a low likelihood of great crested newts being present within these areas and they are unlikely to make a significant contribution to FCS at a county level.

Previous Survey Work

It is known that surveys were undertaken by CES in 2016 of Ponds 1 and 2. These surveys established a small breeding population of great crested newts in both Ponds 1 and 2. Peak counts were; two great crested newts in Pond 1 and six great crested newts in Pond 2.

Local Status

North East Wales, including parts of Flintshire and the neighbouring County Borough of Wrexham, is one of the strongholds of the great crested newt within the UK. Due to the soil type, underlying geology and historical farming practices, lowland parts of Flintshire have a particularly high density of suitable ponds and reach a high concentration, particularly in the southeast of the county. Flintshire contains two internationally significant sites for the species: the Deeside & Buckley Newt Site Special Area of Conservation (SAC) which comprises Buckley Clay Pits & Commons, Connahs Quay Ponds & Woodlands and Maes y Grug Sites of Special Scientific Interest (SSSI); and Halkyn Mountain SAC which is comprised of Halkyn Common & Holywell Grasslands and Herward Smithy SSSIs. The decline of great crested newts within Flintshire has been acknowledged and actions concerned within the conservation of great crested newts were included within the Freshwater Habitat Action Plan, which was part of the Flintshire Biodiversity Action produced by the Flintshire Biodiversity Partnership in 2002.

C.2 Statutory sites notified for the species (SSSIs or SACs) within 10km

Deeside and Buckley Newt Sites Special Area of Conservation (SAC) lies approximately 4.4km north west of the site designated for its populations of great crested newt. The SAC comprises the following Sites of Special Scientific Interest SSSIs).

Buckley Claypits and Commons SSSI, approximately 4.4km north west of the site. Water bodies at Buckley Claypits and Commons support one of the largest breeding populations of the great crested newt in Great Britain. Torch night counts undertaken during the spring have revealed over 100 adult and sub-adult animals on several occasions.

Connah’s Quay Ponds and Woodland SSSI lies approximately 7.2km north west of the site. Water bodies within the site in total support one of the largest known breeding populations of the great crested newt in Great Britain.

Maes y Grug SSSI, lies approximately 8.3km north west of the site. The site is of special interest for its large population of the great crested newt.

C.3 Objectives of the survey

The aims of the survey were to:

- Undertake a walkover survey of the proposed development site and surrounding land, to locate all water-bodies within 250m (where there is land access).
- Undertake a review of existing maps and aerial photographs where there is no land access.

- Undertake an amphibian survey of water-bodies, following standard guidance and recommended survey methodologies.
- To identify the presence/absence of great crested newt and other amphibians on site.
- Undertake a population size class assessment of great crested newt populations (if found to be present).
- eDNA was also utilised at this site.

C.4 Scaled plan/map of survey area

A scaled location plan and aerial photograph of the site are included as Figures 1a and 1b and a pond location plan as Figure 2.

C.5 Site/habitat description (relevant to great crested newts)

The site comprises an area of land off Sandy Lane, Higher Kinnerton, Flintshire, CH4 9DZ, National Grid Reference (NGR) 333381, 361536 at centre. The development site, which is bisected by Sandy lane, is referred to within this report as Area A and Area B to provide for ease of reference. The site, however, is assessed as a single development. See Figure 2, Pond location plan.

The development site is located on the north easterly boundary of the village of Higher Kinnerton. Area A is located to the east of Sandy Lane and Area B to the west of Sandy Lane. Land surrounding the site comprises residential housing of Higher Kinnerton and agricultural land, consisting of both cropland and pasture, linked by a network of hedgerows and dry ditches. A dismantled railway line lies to the south-east of Area A.

An Extended Phase 1 Habitat Survey of the site was undertaken during June 2018. The development site contains the following habitats illustrated on Figure 2, Pond location plan:

- Scattered Trees
- Scrub (Scattered)
- Neutral Semi-improved Grassland (Species -poor)
- Tall Ruderal
- Standing Water (Pond & Dry ditches)
- Hedgerows

Area A predominantly comprises species-poor, semi-improved grassland managed by cutting at least twice per year, bounded by species-rich hedgerows to the west and north-east. A belt of semi-natural broadleaved woodland lies adjacent to the south eastern boundary on the steep embankment of a disused railway line, extending to the north east and south west of the site. To the north lies a residential property and garden, separated from the site by a fence. To the west and north east of the site lie minor country roads, kerbed along some sections, but largely unkerbed. Area B similarly supports species-poor, semi-improved grassland managed by cutting at least twice per year, with species-rich hedgerows to the north west and east. The south western boundary adjoining adjacent properties is bounded by a fence. The site is bordered by minor country roads to the north west and east. Arable land is located to the north east of the site with improved grassland to the north. To the west of the site is residential development.



View across Area A (September 2018)



View across Area B (September 2018)

Pond Description

The review of existing maps and aerial photographs identified several ponds located within the wider survey area. A walkover survey found three ponds located within 250m of the site, Pond 3 approximately 225m to the north east of the site being found to be unsuitable due to being within an online flowing ditch system supporting fish and Pond 4 approximately 210m to the north being absent. Standing water was found within both Area A (Pond 2) and Area B (Pond 1) and to the south of Area A (Pond 5). Detailed pond descriptions are provided below.

Pond 1 located in Area B is a circular pond located in the south of the site that is reaching its late successional stage. It has a perimeter of approximately 45m with shallow sloping banks and a sediment base and a water depth of approx. 1m. It is shaded up to 20% by a willow

tree (*Salix* spp.) and is heavily vegetated by abundant water horsetail (*Equisetum fluviatile*). There was no evidence of fish or wildfowl.



Pond 1 (May 2018)



Pond 1 (December 2018)

Pond 2 located in Area A is a circular pond, with a perimeter of approx. 30m located on the eastern boundary of the site. Heavily shaded by scrub including willow and hawthorn (*Crataegus monogyna*). The banks have a shallow gradient with a water depth of approximately 1m and a sediment base. Marginal vegetation includes: occasional floating sweet-grass (*Glyceria fluitans*), bittersweet (*Solanum dulcamara*) and brooklime (*Veronica beccabunga*). There was no evidence of fish or waterfowl. The pond may dry out seasonally although this is believed to be rare.



Pond 2 (December 2018)

Pond 5 located south of Area A is a circular pond, located on the border of an agricultural improved grassland adjacent to Sandy Lane. The pond is surrounded by trees and hawthorn scrub. The pond has shallow banks and an approximate perimeter of 30m. The water quality is poor with a depth of approx. 1m and a leaf litter and sediment base. Marginal vegetation was absent and there was no evidence of fish or waterfowl. The pond dries up seasonally and did so over the survey period.



Pond 5 (May 2018)

C.6 Field survey(s).

Great Crested Newt Presence/Absence Methodology

The following survey methods adhere to Natural England's survey guidelines as recommended by Natural Resources Wales. A combination of survey techniques was utilised

at this site, including bottle trapping, torch light surveys, and egg searches, to give a full picture of amphibian activity and to compensate for limitations of any one technique.

Torch Light Survey

Water-bodies were surveyed by walking the perimeter of the water-bodies after dusk and searching the water with a powerful torch (Night-lite, one million candle power). It is often not possible to achieve 100% coverage of shorelines of all water-bodies using the torch light surveys because of access difficulties, for example dense marginal vegetation. Estimates of the percentage of shoreline of each water-body surveyed and other factors affecting torch light counts are provided.

Bottle Trap Survey

The bottle traps used were constructed from a two-litre plastic bottle, with an inverted neck, secured to the pond bottom by a cane passing through the trap at an angle and operated with an air bubble.

Bottle traps were set at an average spacing of 2m along accessible shorelines (to allow estimation of population size). Where significant lengths of shoreline are inaccessible, or if the pond is very large, bottle trapping will be used in the accessible areas, using 2m spacing as a means of standardising survey effort.

Traps were set in the evening and operated overnight before being emptied early the following morning. Newts are particularly at risk on warm, sunny days in shallow water traps. Traps were operated well within the maximum time limits set by official guidelines of UK governing bodies:

- Up to 17 hours for traps with an air bubble through-out the survey period.
- 12 hours in March through to April for traps without an air bubble.
- 10 hours in May for traps without an air bubble.
- 8 hours in June for traps without an air bubble.

Estimates of the percentage of shoreline of each water-body surveyed and other factors affecting bottle counts are provided. Where it is not possible to logistically trap an entire shoreline sample sections will be trapped (with bottles at 2m spacing) in locations deemed most likely to yield newts e.g. amongst egg-laying vegetation for females and in open water for displaying males.

Egg Search

Great crested newts lay their eggs singly on the leaves of submerged vegetation. The vegetation is folded over the egg to form a protective 'purse'. The eggs of great crested newts can be distinguished from those of the two smaller newt species – smooth and palmate newts because they are slightly larger (3 - 4mm) in size, with a pale lemon coloured yolk. The smooth and palmate newt eggs are 2 - 3mm in size, with a white or grey tinged yolk. A female great crested newt can lay 300+ eggs, so detection rates for eggs are higher than for adults. The presence of eggs confirms the water-body as a breeding site. However, it is impossible to obtain any reliable population estimate on the basis of a newt egg count. Also, it is undesirable for the conservation of the species to survey for eggs intensively, as the unfolding of vegetation to confirm the type of egg will tend to render the egg more vulnerable to predation or to be dislodged. Therefore, no attempt will be made to quantify the number of eggs in a pond; searching will be stopped once an egg has been found.

Searching for newt eggs is useful between March and July (peak egg laying period April - June). Not all eggs are viable, so although most eggs will have hatched by June, non-viable eggs will remain on vegetation longer, before decaying or becoming predated. Aquatic vegetation was searched for newt eggs by walking or wading the shoreline and looking for the characteristic shape of folded leaves on favoured plants for ovipositing.

eDNA

Due to the late successional stage of Pond 1, dense vegetation may have constrained the detection of the presence of great crested newt (although other newt species were found) and that the surveys were undertaken at the latter end of the survey season it was decided to utilise eDNA to confirm presence/absence for Pond 1.

Environmental DNA (eDNA) is nuclear or mitochondrial DNA that is released from an organism into the environment. Sources of eDNA include secreted faeces, mucous, gametes, shed skin, hair and carcasses. In aquatic environments, eDNA is diluted and distributed in the water where it persists for 7–21 days, depending on the conditions.

Recent research has shown that the DNA of a range of aquatic organisms can be detected in water samples at very low concentrations using qPCR (quantitative Polymerase Chain Reaction) methods.

A test primer has been developed (a length of artificial DNA which specifically binds to and amplifies the DNA of the target organism) which is able to detect Great Crested Newt eDNA successfully in water samples.

The research carried out by the Freshwater Habitats Trust (FHT) show that the test can be more effective in confirming the presence or absence of great crested newt than a combination of conventional survey techniques. This is for the periods between mid-April and June.

The method used to collect the eDNA followed the Analytical and methodological development for improved surveillance of the Great Crested Newt (WC1067) Appendix 5 Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA, dated 30th September 2014. Upon collection samples were sent by courier to SureScreen Scientifics.

Amphibian Survey Effort

The level of survey is always aimed at surveying 100% of the pond bank, however, physical barriers and human health and safety reasons can prevent survey of all areas in certain environments. The level of survey effort is detailed in the following sections:

Torch Light Survey Effort

Water-bodies were surveyed by walking the perimeter of the water-bodies after dusk and searching the water with a powerful torch. Estimates of the percentage of shoreline of the water-body surveyed and other factors affecting torch light counts are given in the results Table 1.

Table 1: Torch Light Survey Effort, 2018

Pond No.	Approx. % of shoreline covered	Comments
1	100%	No access issues
2	70%	Pond was next to old railway and dense scrub prevented access at one side.
5	100%	Pond dried up between survey rounds 4 and 5.

Bottle Trap Survey Effort

Estimates of the percentage of shoreline of the water-body surveyed and other factors affecting bottle counts are given in Table 2. Where it was not logistically possible to trap an entire shoreline, sample sections were trapped (with bottles at 2m spacing) in locations

deemed most likely to yield newts e.g. amongst egg-laying vegetation for females and in open water for displaying males.

Table 2: Bottle Trap Survey Effort, 2018

Pond No.	Perimeter (m)	No. bottles	Average spacing (m)	Approx. % of shoreline trapped	Comments
1	45m	23	2m	100%	No access issues
2	30m	10	2m	70%	Pond was next to old railway and dense scrub prevented access at one side
5	30m	12	2m	80%	Scrub preventing access. Pond dried up between survey rounds 4 and 5.

Egg Search Effort

Pond 1 is in its late successional stage containing marginal vegetation and aquatic vegetation on 100% of its margins, extensive egg searches were undertaken within suitable egg laying vegetation including; water mint (*Mentha aquatica*) and floating sweet-grass.

Pond 2 is heavily shaded, with aquatic vegetation being present in only a couple of areas, mainly consisting of floating sweet-grass and brooklime, but tree roots and dead leaves were also checked. The search area comprised of 70% of the pond margin.

Pond 5 is heavily shaded with no marginal or aquatic vegetation present, and therefore egg searches consisted of checking leaf litter (as great crested newt eggs have previously been found deposited on leaf litter) on 100% of the pond margins.

Timing

Torch light surveys, bottle trapping, netting and egg searches were employed during the peak period of breeding activity (April – May). Surveys were carried out on the following dates, using the following methods, as shown in Table 3:

Table 3: Summary of Field Survey Techniques, 2018

Survey dates	Torch light counts	Bottle trapping	Egg/spawn searches
17 th /18 th May 2018	✓	✓	✓
20 th /21 st May 2018	✓	✓	✓
22 nd /23 rd May 2018	✓	✓	✓
29 th /30 th May 2018	✓	✓	✓
7 th /8 th June 2018	✓	✓	✓
11 th /12 th June 2018	✓	✓	✓

The eDNA sample of Pond 1 was taken on the 12th of June 2018, which is within the accepted sample period of mid-April to the end of June.

Weather Conditions

Weather conditions on the nights of survey/sample collections were reasonable, with no appreciable rain or wind affecting the survey. Temperatures ranged from 5°C to 12°C at midnight and at the end of surveys. On none of the survey dates was the temperature forecast to fall below 5°C. The weather conditions during each of the surveys are given in Table 4.

Table 4: Weather Conditions

Date	Air Temp °C	Rain	Wind
17-05-18	14	0	0
20-05-18	15	0	0
22-05-18	16	0	0
29-05-18	17	0	0
07-06-18	16	0	0
11-06-18	17	0	0

Personnel

Torch light surveying of known great crested newt ponds, catching great crested newt in bottle traps, disturbing refugia and egg searches are all licensed activities. Torch light, bottle trap and egg searching were conducted under Natural Resources Wales Licence No. 72380:OTH: SA:2016 by Mrs. L. Eccles-Sargeant, whom was agented under this licence (Lyn has 18 years of consultancy experience and has held a Natural England great crested newt survey licence over this period. She has held several Natural England EPS development licences, a conservation licence and is a registered consultant for Low Impact Class Licence (LICL). Lyn is also an Expert Advisor on Natural England’s Districting Licensing Panel). For health and safety reasons assistants were employed.

The eDNA samples were undertaken by suitably experienced Ecologists Mrs. L. Eccles-Sargeant and Miss. C. Wood, the former is agented under Natural Resources Wales Licence No. 72380:OTH: SA:2016.

Limitations of Survey

It is often the case that sites cannot be surveyed using all available techniques to full effect, as there are frequent restrictions such as season, weather and access, which limit survey intensity.

In this case, access was restricted due to an old railway backing on to one edge of Pond 2 and dense scrub vegetation around Pond 5. It is considered that the limited access to these ponds did not affect the survey results or the effectiveness of the survey.

Due to the late successional stage of Pond 1, dense vegetation may have constrained the detection of the presence of great crested newt, although other newt species were found.

Water quality in Pond 5 was poor and rather stagnant, although the water was clearer towards the pond edge. Water turbidity for Pond 2 was high on the first and sixth surveys. Torch light surveys were slightly extended to try and record any amphibians taking air at the water surface.

Due to the late commissioning of the surveys, the surveys were undertaken outside of the core breeding season (mid-April to mid-May) and the surveys may therefore have underestimated the population size present. Newt eggs (incl. great crested newt eggs in Pond 2) were, however, present in both Ponds 1 and 2.

There were no limitations to the eDNA sample collection for Pond 1.

C.7 Survey Results.

The pond location plan and habitat information is included on Figure 2.

Torch Light Survey Results

Results of the torch light surveys are detailed in Table 5.

Table 5: Torch Light Survey Results, 2018

Pond No.	Date	Air Temp °C	Veg Cover (0-5)	Turbidity Score (0-5)	Tc	Lv	Lh	Bb	Rt	Other
1	17-05-18	14	4	3	-	-	-	-	1/10tp	
1	20-05-18	15	4	2	-	-	-	-	3tp	-
1	22-05-18	16	4	2	-	-	-	-	10tp	-
1	29-05-18	17	4	3	-	2		-	13/10tp	-
1	07-06-18	16	4	3	-	2		-	-	-
1	11-06-18	17	4	3	-	-	-	-	1	-
2	17-05-18	14	2	5	-	-	-	-	-	-
2	20-05-18	15	2	3	-	1	2m/2f	-	-	-
2	22-05-18	16	3	3	-	-	2m/3f	-	-	-
2	29-05-18	17	2	3	-	2m/2f	1m/2f	-	-	-
2	07-06-18	16	2	3	-	1m/2f	-	-	-	-
2	11-06-18	17	3	4	-	-	-	-	-	-
5	17-08-18	14	2	4	-	1f	-	-	-	-
5	20-05-18	15	2	4	-	-	-	-	-	-
5	22-05-18	16	0	4	-	-	-	-	-	-
5	29-05-18	17	0	0	-	-	-	-	-	-

Note: Vegetation cover score (0-5); 0= no vegetation obstructing survey; 5 water completely obscured by vegetation
Turbidity score (0-5): 0+ completely clear; 5 = very turbid.
Tc = great crested newt; Lv = smooth newt; Lh = palmate newt; m = male; f = female; Bb = common toad; Rt = common frog; S = spawn; Tp = Rt/Bb tadpole; L = newt larva

No fish or non-native invasive plan species were recorded in any of the ponds.

Bottle Trap Survey Results

Results of the bottle trap survey are summarised in Table 6.

Table 6: Bottle Trap Survey Results, 2018

Pond No.	Survey Date	Tc			Lv	Lh	Bb	Rt	Other
		M	F	Total					
1	18-05-18	-	-	0	1m	-	-	1/50tp	-
1	21-05-18	-	-	0	-	-	-	50tp	-
1	23-05-18	-	-	0	-	-	-	1/30tp	-
1	30-05-18	-	-	0	4m	-	-	-	-
1	08-06-18	-	-	0	-	-	-	5/1tp	-
1	12-06-18	-	-	0	1L	-	-	-	-
2	18-05-18	-	-	0	1f	-	-	-	-
2	21-05-18	-	1	1	-	-	-	-	-
2	23-05-18	-	-	0	-	-	-	-	-
2	30-05-18	-	3	3	-	2m	-	-	-
2	08-06-18	-	-	0	-	1m	-	-	-
2	12-06-18	-	-	0	-	-	-	-	-
5	18-08-18	-	-	0	-	-	-	-	-
5	21-05-18	-	-	0	-	-	-	-	-
5	23-05-18	-	-	0	-	-	-	-	-
5	30-05-18	-	-	0	-	-	-	-	-

Note: Tc = great crested newt; Lv = smooth newt; Lh = palmate newt; m = male; f = female; Rt = common frog; Bb = common toad; S = spawn; Tp = Rt/Bb tadpole; L = newt larva

No fish or non-native invasive plan species were recorded in any of the ponds.

Egg Search Survey Results

Great crested newt eggs were found in Pond 2 during the surveys, once great crested newt eggs were found, searches were stopped. No great crested newt eggs were found in Pond 1 (during extensive searches) or Pond 5.

Smooth newt eggs were found in the Pond 1. It is considered likely that smooth and palmate newt eggs were in Pond 2, but searches were stopped immediately after great crested newt eggs were found. There is no known way to distinguish between smooth and palmate newt eggs in the field, which ever species is recorded by using other methods, it is taken that the eggs would be of the species recorded.

eDNA Sample Results

Following analysis of the samples by SureScreen, the eDNA results are presented in Table 7 below. The SureScreen Scientifics Technical Report can be found in Annex K2.

Table 7: eDNA Results

Pond No.	Sample date	Sample time	% of pond accessed	Relevant notes	Positive/negative & Replicates
1	12.06.18	09:00	100%	Very little open water, samples taken between vegetation.	Negative

Note: Amber cells denote risk factor, as sample area was either under 80% or there is a sediment warning in relation to positive results only.

C.8 Interpretation/evaluation of survey results

Positive evidence of breeding great crested newt was discovered at this site in Pond 2 (peak count of 3) by using the methods described above. The amphibian survey techniques strictly followed the methods stated within this report which adhere to Natural England’s recommended survey techniques. While the surveys were undertaken outside of the core breeding season, the results of the surveys are consistent with the previous surveys undertaken in 2016 (with at least three of the survey visits undertaken during the core breeding season in accordance with the mitigation guidelines) which found a peak count of 6 great crested newts in Pond 2, however, they also found a peak count of two great crested newts in Pond 1. The combined peak count from both ponds on any one night was 7 adults. Breeding was confirmed in both ponds in 2016.

Other amphibians found to be present at this site in 2018 included: smooth newt, palmate newt and common frog.

Using Natural England’s population size class assessment, the 2018 population of great crested, smooth and palmate newts found can be classified by the following:

- “Small” “Low” for maximum counts up to 10.
- “Medium” “Good” for maximum counts between 11 and 100.
- “Large” “Exceptional” for maximum counts over 100.

Using above approach, the populations of great crested newt, smooth newt and palmate newt at this site in 2018 can be classed as being small in size.

The 2018 surveys were specifically designed to identify presence of great crested newt and were undertaken during the peak newt breeding season. The breeding season of common toad is slightly earlier in the year than the newt breeding season and therefore a population assessment cannot be accurately derived based upon the presence of tadpoles only.

Previous surveys undertaken in 2016 found great crested newts to be present in Pond 1. The 2018 amphibian surveys found great crested newts to be absent in Pond 1, taking into

account the limitations of the surveys; latter end of the breeding season and the dense vegetation cover, it was decided to utilise eDNA to confirm presence/absence. The eDNA sample returned as negative, confirming the 2018 amphibian survey result.

D. Impact assessment

D.1 Short-term impacts: disturbance

There will be no loss of aquatic habitat to the development; both ponds within the development site (Ponds 1 and 2) will be retained.

Regarding impacts on dispersal corridors and access to foraging and breeding sites, Pond 1 will be retained within an area of public open space of approximately 640m² (minimum buffer of 2m) with a habitat corridor running inside the south western boundary of the site providing connectivity to the wider countryside. The south western boundary borders onto adjacent gardens. There will be no habitat buffer to Pond 2 within the site, however immediately to the south east of the pond lies the disused railway line providing a buffer of approximately 25m wide and providing a corridor of high quality habitat (semi-natural broadleaved woodland) along the south eastern boundary of Area A extending north eastwards and south westwards beyond the site boundary providing a significant habitat corridor.

There will be loss of approximately 4.27ha poor quality terrestrial habitat within the site (0.49ha of which will be temporary loss), however the design has retained some terrestrial habitat including the majority of the hedgerows (providing good quality foraging habitat) and maintained connectivity to the wider countryside and foraging opportunities there.

Without the implementation of appropriate mitigation, there is the risk of killing/injury of great crested newts during site clearance and construction, including through movement of construction vehicles, injury to individuals seeking shelter amongst building materials or entrapment in trenches. There is also a risk of accidental damage to the ponds and pollution from run-off and dust deposition during site clearance and construction.

D.2 Long-term impacts: site modification

There will be no loss of aquatic habitat to the development; both ponds within the development site (Ponds 1 and 2) will be retained.

Areas of retained habitat, including all boundary hedgerows, will be enhanced and managed to provide high quality habitat in the longer term. SUDS areas have potential to provide additional habitat (terrestrial and aquatic) for great crested newts.

Artificial light spill from the completed development onto ponds and terrestrial habitat could negatively affect great crested newts and other amphibians.

D.3 Long-term impacts: site loss

There will be no loss of aquatic habitat to the development; both ponds within the development site (Ponds 1 and 2) will be retained and enhanced through clearance of excessive vegetation/overshading scrub and localised removal of accumulated silt as required. There will be permanent loss of 3.78ha poor quality terrestrial habitat (species-poor, semi-improved cut grassland) although the majority of the species-rich hedgerows providing good quality terrestrial habitat will be retained. Pond 1 will be retained within an area of open space of approximately 640m² (minimum buffer of 2m) with a habitat corridor (approximately 2m or more wide) running along the south western boundary connecting to further areas of open space to the east and to the wider countryside. Pond 2 lies immediately adjacent to high quality habitat to the east, beyond which lies further grassland. The design includes an area of terrestrial habitat to the south of Pond 2, connected via the strip of offsite woodland.

Partial destruction of immediate terrestrial habitat within 50m of a breeding pond and destruction of intermediate terrestrial habitat with 50-250m of a breeding pond represents a medium impact on great crested newts at the site level without mitigation. The site supports a low population of great crested newts, not connected with other known populations locally, the nearest known records being 1km or more from the site. No significant impacts are therefore anticipated in the wider context.

D.4 Long-term impacts: fragmentation and isolation

Pond 1 is situated on the south western boundary of Area B adjoining existing residential gardens to the south west. The development has been designed to incorporate a habitat corridor along the south western boundary of Area B (approximately 2m or more wide) providing potential connectivity to the wider countryside to the north west and to areas of habitat to be provided along the eastern boundary of Area B and the wider countryside to the north east and east. Pond 1 was not found to support great crested newts in 2018, but had previously supported a low population in 2016. Pond 2 is situated on the south eastern boundary of Area A adjacent to a disused railway line providing good quality habitat (semi-natural broadleaved woodland) and a habitat corridor outside the eastern boundary of the site extending to the north east and south west of the site.

All boundary hedgerows have been retained to provide future habitat corridors for great crested newts. There will be loss of two short sections of hedgerow to provide access into the two development areas. Loss of hedgerow has been kept to a minimum (approximately 22m in total). New hedgerows are to be planted which will improve connectivity along the site boundaries. Roads within the scheme have been designed with dropped kerbs and inset kerb stones by gully pots to facilitate movement of great crested newts around the site in the long-term and minimise the risk of entrapment in gully pots.

D.5 Post-development interference impacts

Roads within the scheme have been designed with dropped kerbs and inset kerbs by gully pots to minimise the risk of killing/injury of great crested newts post-development. There is a risk of introduction of fish to the ponds by residents which could predate on great crested newt eggs and larvae and potential introduction of damaging invasive plants. Terrestrial habitat could be damaged by dumping of rubbish or setting of fires, etc. Dogs playing in the water could cause disturbance and damage to aquatic habitat.

D.6 Predicted scale of impact

There will be no loss of aquatic habitat to the development; both ponds within the development site (Ponds 1 and 2) will be retained. There will be partial destruction of immediate terrestrial habitat within 50m of a breeding pond and destruction of intermediate terrestrial habitat with 50-250m of a breeding pond representing a medium impact on great crested newts. Enhancement and management of retained habitat to provide high quality habitat in the longer term will help offset the impact of habitat loss and proposed SUDS areas have potential to provide additional habitat for great crested newts (both terrestrial and aquatic). Habitat connectivity for both ponds within the site is being maintained with the wider landscape. Artificial light spill from the completed development onto ponds and terrestrial habitat could negatively affect great crested newts and other amphibians. Post development interference with a breeding pond is considered to be a high impact a medium impact for immediate terrestrial habitat and a low impact for intermediate terrestrial habitat.

The predicted scale of impact on species status at the site, 2 km, 10 km, local, county, regional and country levels is as follows:

Table 8. Scale of Impact on species status

Geographic level	Predicted scale of impact
Site	Moderate impact
2km	No impact
10km	No impact
Local	No impact
County	No impact
Regional	No impact

Delivery Information - Mitigation, compensation and monitoring

E. Works to be undertaken

E.1 Great Crested Newt capture and exclusion (if applicable).

Both Areas A and B will be enclosed and compartmentalised with temporary amphibian exclusion fencing as specified in The Great Crested Newt Mitigation Guidelines (English Nature, 2001). Both ponds will be left outside the fencing. Connectivity to Pond 1 will be maintained along the south western boundary of Area B and gardens beyond the site boundary (although no great crested newts were found to be present in Pond 1 in 2018). Pond 2 will have continued access to terrestrial habitat to the south east maintaining connectivity with Pond 5. The fence layout is shown on Figure 3. The fencing will extend through the hedgerows where sections are to be removed for site access. Fence installation will be undertaken by an experienced contractor under the supervision of an appropriately experienced ecologist.

The proposed fence-line will first be searched and cleared of amphibians by an appropriately experienced ecologist. If required, vegetation will be cut back to a height no less than 150mm to avoid harm to any amphibians. The installation of the exclusion and drift fencing will be undertaken outside of the newt hibernation season i.e. between March and the end of October subject to the minimum overnight air temperature being consistently above 5°C. If required, control of vegetation growth along the fence-line will be undertaken to prevent the fence becoming overgrown, which could enable the newts to breach the fence. This will be achieved by careful application of an approved herbicide which is licensed for aquatic use (such as Roundup Biactive) to a narrow strip (50cm) on whichever side(s) of the fence newts are being prevented from climbing. Alternatively cutting the vegetation using a strimmer may be undertaken but care must be exercised to prevent damage to newts or to the fence.

Pitfall traps will be installed around the inside of the perimeter fencing and both sides of the internal drift fence, flush to the fences and spaced at intervals between 5 and 10m. The pitfalls will be installed at a minimum density of 50 traps per ha in accordance with the Great Crested Newt Mitigation Guidelines. Pitfall traps will be furnished with a sufficient quantity of suitable vegetation to act as an amphibian refuge. This material will be kept moist at all times and replenished as necessary. A mammal ladder, consisting of a twig not more than 1cm in diameter will be installed in each pitfall. Where buckets are liable to flooding, a floating raft such as tree bark will be added. Pitfall trapping will be undertaken between March and the end of October subject to suitable weather conditions.

A minimum of 30 nights trapping under suitable weather conditions will be undertaken by appropriately qualified ecologists. Suitable weather conditions are generally taken to be: night air temperature >5°C, with rain (or if no rain, there should have been some rain in the last few days, such that the ground is damp). A maximum/minimum thermometer will be deployed at the site to record the minimum overnight temperature. Trapping will not take place in periods of extreme weather conditions where any newts trapped may be at risk from

extremely high or low temperatures or from drying out. When not in use, traps will be removed or closed securely, as appropriate. Any broken traps will be removed for safe disposal. Pitfall traps will be checked at least once in every 24 hours between 06.00 and 11.00 hours by an appropriately experienced ecologist. Any amphibians captured will be moved to the receptor area and released as soon as possible, using suitable, lidded containers with air-holes and ample moist vegetation. Newts will be released into the cover of a similar habitat to the one from which they have been captured. The location of the receptor areas are shown on Figure 3.

To increase the chances of capture, suitable refuges (e.g. carpet tiles) will be placed along the fence line at a similar density to the pitfall traps. These refuges should also be fitted flush up to the fence. It may take about two weeks for them to become 'bedded-down' enough to be attractive as refuges. Rubber-backed carpet off-cuts, about 50cm square, appear to be moderately effective in creating the desired humid conditions and are substantial enough not to be blown-away in the wind. Torchlight searches along the fence-lines on warm, wet nights may be undertaken to improve newt capture rates. Cutting vegetation by hand, strimming or mowing of vegetation may be employed to encourage newts to move into trapping areas, to assist in the capture of remaining animals after completion of the minimum 30 days trapping operation. To minimise chances of killing newts where vegetation is dense, cutting will be carried out during periods of hot, dry weather leaving a sward height of around 150mm. If great crested newts are still being encountered at the end of the 30 days, trapping will continue until five trapping nights with no captures is achieved which is generally taken to indicate that suitable effort has been expended at most sites. On completion of trapping, the drift fencing and all of the pitfall traps will be carefully removed under the supervision of an appropriately experienced ecologist, as great crested newts often take refuge in gaps between fences, traps and the ground, and these animals will need to be captured. The two sections of hedgerow to be removed will be subject to a destructive search. Where construction site access will be required ACO stop channel (or similar) will be employed to maintain a barrier to the movement of great crested newts into the site. The perimeter exclusion fencing will be maintained in good condition throughout the development period and removed on completion of the development under the supervision of an appropriately experienced ecologist.

A log will be maintained of fence inspections, maintenance and captures together with a daily log of weather conditions.

E.2 Great Crested Newt habitat

E.2.1 Receptor site modification, enhancement or creation.

The grassland within the receptor areas (Figure 3) will be allowed to grow up in advance of commencement of trapping to provide suitable cover for great crested newts (0.21ha). Scrub (0.025ha) and native species-rich hedgerows (160m) within the receptor area will also be planted during the planting season prior to commencement of trapping and relocation along with creation of artificial hibernacula. Scrub and hedgerow plants will be of local provenance wherever possible. Ash will not be used due to the risk of ash dieback. An additional area of great crested newt habitat will be created (seeded with Emorsgate EM2 General Purpose Meadow Mix or similar) within Area B (0.14ha) and made available to great crested newts on completion of the development. A further 115m new hedgerow will be planted around the boundaries of the site prior to completion of the development which will enhance connectivity along the south west boundary of Area A and northern boundary of Area B. The SuDS areas within Areas A and B will be seeded with a wetland meadow mix (Emorsgate EM8 Meadow Mixture for Wetlands or similar) and will provide additional terrestrial habitat for great crested newts (0.35ha) and possible aquatic habitat during wetter periods. On completion of the development, the site will provide 0.35ha newt habitat, a total of 980m hedgerow plus 0.35ha SuDS.

Clearance of some of the overshading scrub around Pond 2 will be undertaken together with silt removal to try and deepen the water area. Removal of some of the aquatic/marginal vegetation in Pond 1 and localised silt removal will enhance the habitat for great crested newts. Pond works will be undertaken in winter.

E.2.2 Temporary loss of breeding sites, resting places

There will be no temporary loss of breeding sites. The ponds will be protected from run-off/dust during construction by the installation of a geotextile barrier between the pond and the site and implementation of standard best practice pollution prevention measures. Some areas which will provide areas of public open space and designed to provide habitat for great crested newts will need to have great crested newts temporarily excluded while works are being undertaken to create the habitat e.g. the Sustainable Drainage Systems and areas to be seeded/planted. These areas will be included within the trapping area and made available to the newts on completion of the development.

E.2.3 Destruction of existing breeding sites, resting places

No breeding sites will be destroyed. Following completion of trapping and removal of the internal drift fencing, the site will be released for development resulting in loss of 4.27ha low quality terrestrial habitat (0.49ha temporary loss).

The permanent loss of 3.78ha poor quality terrestrial habitat is considered to be compensated by the enhancements of both Ponds 1 and 2 and retained grassland areas, the creation of hedgerows along the boundaries of the site which will enhance connectivity, scrub planting and the creation of six hibernacula providing hibernation habitat on site which is currently absent. SUDS areas have potential to provide additional habitat (terrestrial and aquatic) for great crested newts and amenity grassland areas will provide some foraging potential. The development site will be traversable to great crested newt and, over time, the residential gardens will be used by great crested newt, although there is no guarantee on the quality of this habitat.

E.2.4 Scaled maps/plans

The mitigation plan is included at Figure 4.

E.3 Mechanisms for ensuring delivery of mitigation and compensation measures

E.3.1 Measures to ensure compliance with this method statement.

It is considered that this scheme falls under the Tier 2 requirements of Natural Resources Wales Compliance Audit Guidance Note for EPS development licences. As such, an internal licence compliance audit report will need to be completed by developer. The developer will be required to undertake a compliance audit using key performance indicators. The licensee is responsible for submitting the information and for its accuracy. In most cases the scheme ecological consultant will complete the species-specific sections of the report form and sign off that they have been undertaken as specified. The developer will be responsible for appointing the ecological consultant to undertake the internal audit.

The ecological consultant will be responsible for:

- defining appropriate (key) performance indicators that will inform an inspection, utilising the NRW audit template;
- determining the minimum number of assessment visits required to demonstrate compliance;
- defining what documentation, including logs, will be required to inform inspections;
- progressing remedial or contingency actions identified during audit; and
- reporting back to the developer and NRW.

E.3.2 Ensure that sufficient land has been acquired for compensation purposes

All habitat loss is being mitigated/compensated within the site (enhancement of Ponds 1 and 2, 0.35ha newt habitat, 705m retained hedgerow plus 275m new hedgerow, creation of 6 hibernacula, 0.35ha SuDS and 0.07ha amenity grassland). No additional land is considered necessary for off site compensation.

E.3.3 Ensure that designs of subsequent development are newt friendly

The proposed development has been designed with dropped kerbs and inset kerbs by gully pots in roads to minimise risk of incidental capture/killing of great crested newts.

E.3.4 Provide sufficient resources

All mitigation, compensation and monitoring prior to completion of the development will be funded by Stewart Milne Homes NW England Ltd.

E.4 Mitigation contingencies

Trapping and relocation of great crested newts is weather dependent. If unsuitable weather conditions (too cold/dry) are encountered during trapping, trapping will be suspended, the traps securely closed and the trapping period extended accordingly once suitable weather conditions return.

The mitigation planting will be subject to a maintenance and management programme and any failed stock replaced and remedial action taken as required to ensure created habitat is successful.

E.5 Biosecurity risk assessment

No invasive species have been recorded during survey of the site or the immediate surrounding area to date. If invasive species are identified within working areas an appropriate exclusion zone will be established around all stands. If vegetation clearance is required within the exclusion zones, cut vegetation within those areas will be disposed of appropriately. Methods will follow standard guidance for the species concerned and this may require disposal at a licensed landfill site. It is envisaged that any clearance work of this type would be undertaken by a specialist contractor.

Appropriate biosecurity measures will be implemented in relation to potential spread of Amphibian chytridiomycosis.

ECOLOGY SERVICES LTD – Biosecurity Risk Assessment	
Site Name:	Land off Sandy Lane, Higher Kinnerton
Project Description:	Construction of residential development including associated infrastructure and landscaping, including implementation of mitigation and amphibian exclusion fencing. Post development management, maintenance and monitoring.
Assessment carried out by:	Ms L. Redgrave, Senior Ecologist, CEcol, CEnv, MCIEEM.
Date of Assessment:	12.06.19

Potential Hazard & Activity	Degree of Risk			Control Measures	Remaining Risk		
	L	S	RF		L	S	RF
Staff/contractors/machinery driving between site both during construction and operation of the site. Vehicles spreading pathogens such as	3	4	12	<ul style="list-style-type: none"> Where possible, minimise number of vehicles on site Keep to established tracks and park on hardstanding where possible Keep vehicles free of accumulated mud, particularly 	1	4	4

Potential Hazard & Activity	Degree of Risk			Control Measures	Remaining Risk		
	L	S	RF		L	S	RF
Chytridiomycosis/ invasive species				on tyres, wheel arches and undercarriage <ul style="list-style-type: none"> Disinfect wheels vehicle wheels prior to accessing site 			
Staff/contractors moving between site both during construction and operation of the site spreading pathogens such as Chytridiomycosis/invasive species via footwear/clothing	3	4	12	<ul style="list-style-type: none"> Keep boots and equipment free of accumulated mud Disinfect boots/wellies prior to accessing site Integrate disinfectant measures within site wide biosecurity. Follow the disinfectant procedures set out in ARG Advice Note 4 Amphibian disease precautions: a guide for UK fieldworkers https://www.arguk.org/info-advice/advice-notes/324-advice-note-4-amphibian-disease-precautions-a-guide-for-uk-fieldworkers-pdf-2. 	1	4	4
New establishment of invasive plant species on site. Risk of inadvertent spread by works	2	4	8	<ul style="list-style-type: none"> Ecologist to check site for newly occurring invasive species during each site visit Long term, annual checks of mitigation ponds for establishment of invasive species. Implementation of control measures as appropriate. 	1	4	4

Likelihood (L)	Severity (S)
1. Remote	1. Negligible
2. Unlikely	2. Slight
3. Possible	3. Moderate
4. Likely	4. High
5. Almost Certain	5. Very High
Risk Factor (RF) = Likelihood x Severity	

F. Post-development site safeguard

F.1 Habitat/site management and maintenance

The mitigation planting will be subject to a maintenance and management programme and any failed stock replaced and remedial action taken as required to ensure created habitat is successful. The development will be subject to a sensitive lighting design to ensure the ponds and newt habitat are protected from light spill.

Following completion of the development, the mitigation land will be transferred to a management company which will be responsible for the ongoing management and maintenance, funded via an annual service charge for residents. Management and maintenance will include:

- Aquatic vegetation management in ponds;

- Clearance of shading tree or scrub cover around pond margins;
- Desilting and clearance of leaf-fall (infrequent, long-term);
- Mowing/ cutting of grassland;
- Scrub management, e.g. long rotation coppice;
- Removal of fish/ invasive non-native plant species (if required);
- Removal of dumped rubbish/litter;
- Reinstatement of damaged habitat (if required);
- Repair to any protective fencing; and
- Repair/replacement of damaged interpretation boards.

F.2 Population monitoring

In accordance with the recommendations in the Great Crested Newt Mitigation Guidelines, for a small population and medium impact, presence absence surveys of Ponds 1, 2 and 5 will be undertaken in accordance with the Mitigation Guidelines for two years following completion of the development. Monitoring will be undertaken by appropriately qualified ecologists. Certain qualitative checks will be made when undertaking monitoring, such as the presence (and use of) egg-laying plants, presence of late-stage larvae (July-August) and pond permanence.

F.3 Post-development mitigation contingencies

The risk of post development interference impacts will be minimised through the provision of interpretation boards by ponds and within areas of terrestrial habitat to inform residents of the importance of these areas. The ponds will be securely fenced to prevent access by residents and their dogs to minimise the risk of damage/introduction of fish/non-native invasive plant species. Long term monitoring of the great crested newt habitat will be undertaken to identify any issues and appropriate action will be implemented as required such as control of invasive species/fish, management of vegetation, localised desilting of ponds, removal of litter, reinstatement of damaged habitat, repair of fencing or replacement of interpretation boards.

F.4 Mechanism for ensuring delivery of post-development works

Following completion of the development, the mitigation land will be transferred to a management company which will be responsible for the ongoing management, maintenance and monitoring funded via an annual service charge for residents. Implementation of this method statement will be a requirement of the licence and it is a legal offence not to comply with the conditions of a licence.

G. Timetable of works

Activity	Timing (Outline)
Receptor site terrestrial habitat works (planting and hibernacula creation)	Planting season (Nov to Feb inclusive) in advance of commencement of exclusion and relocation works.
Newt fence, pitfall trap and artificial refugia installation	Between March and October inclusive when minimum overnight temperature consistently above 5°C.
Newt capture	Minimum 30 nights between March and October inclusive when minimum overnight temperature consistently above 5°C with recent rainfall.
Drift fence removal	Following completion of relocation between March and October inclusive when minimum overnight temperature consistently above 5°C.
Destructive searches (hedgerow sections)	Following completion of relocation between March and October inclusive when minimum overnight temperature consistently above 5°C.

Activity	Timing (Outline)
Construction period (incl. creation of SUDS and landscaping)	TBC
Site checks and fence maintenance during construction	Throughout construction period
Exclusion fence removal	Following completion of construction between March and October inclusive when minimum overnight temperature consistently above 5°C.
Habitat management and maintenance	TBC
Population monitoring	Mid-March to end June. Two years following completion of construction.

H. Land Ownership – Mitigation Site/Compensation Site

H.1 Mitigation Site/Compensation Site Ownership

All mitigation and compensation is being provided within the land owned by the applicant/developer.

H.2 Mitigation Site/Compensation Ownership post construction

Following completion of the development, the mitigation land will be transferred to a management company which will be responsible for the ongoing management, maintenance and monitoring funded via annual contributions from residents.

I. Declaration

<p>I declare that should a licence be granted, the work as proposed in this Method Statement will be strictly adhered to. I understand that any deviation from the works as proposed in this Method Statement without agreement from NRW would result in a breach of the licence.</p> <p>NB. Applicants should note that it is an offence under regulation 59 of the Conservation of Habitats and Species Regulations 2017 to knowingly or recklessly provide false information in order to obtain a licence.</p>			
Signature of the Applicant		Date	
<p><i>For electronic submissions please insert an electronic signature above or place an x in the box opposite to confirm agreement with the declarations above.</i></p>			<input type="checkbox"/>
Full name in BLOCK LETTERS			
Signature of the Ecologist		Date	
<p><i>For electronic submissions please insert an electronic signature above or place an x in the box opposite to confirm agreement with the declarations above.</i></p>			<input type="checkbox"/>
Full name in BLOCK LETTERS			

J. References

Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F (2014). Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Freshwater Habitats Trust: Oxford.

CES Ecology (2016) Site off Main Road, Higher Kinnerton, Flintshire, North Wales - Great Crested Newt Survey, and Mitigation, Habitat Enhancement and Compensation Measures

English Nature (2001) Great Crested Newt Mitigation Guidelines (August 2001 version). English Nature. Peterborough.

Natural Resources Wales (undated). Compliance Audit Guidance Note for EPS development licences. Available at: <https://naturalresources.wales/permits-and-permissions/protected-species-licensing/european-protected-species-licensing/great-crested-newt-licensing/?lang=en>. Accessed June 2019.

Russell L, Starnes T and Wilkinson J (2017). Spatial Action Plan for Great Crested Newts in Flintshire, A Manual for Achieving Favourable Conservation Status. NRW Science Report Series. Report 78 pp 69, NRW, Bangor.

Figure 1a:
Location Plan

Figure 1a: Location Plan

Map Ref: (NGR) 333422, 361462
Map Scale: 1:25,000 @ A3

KEY

 Site boundary

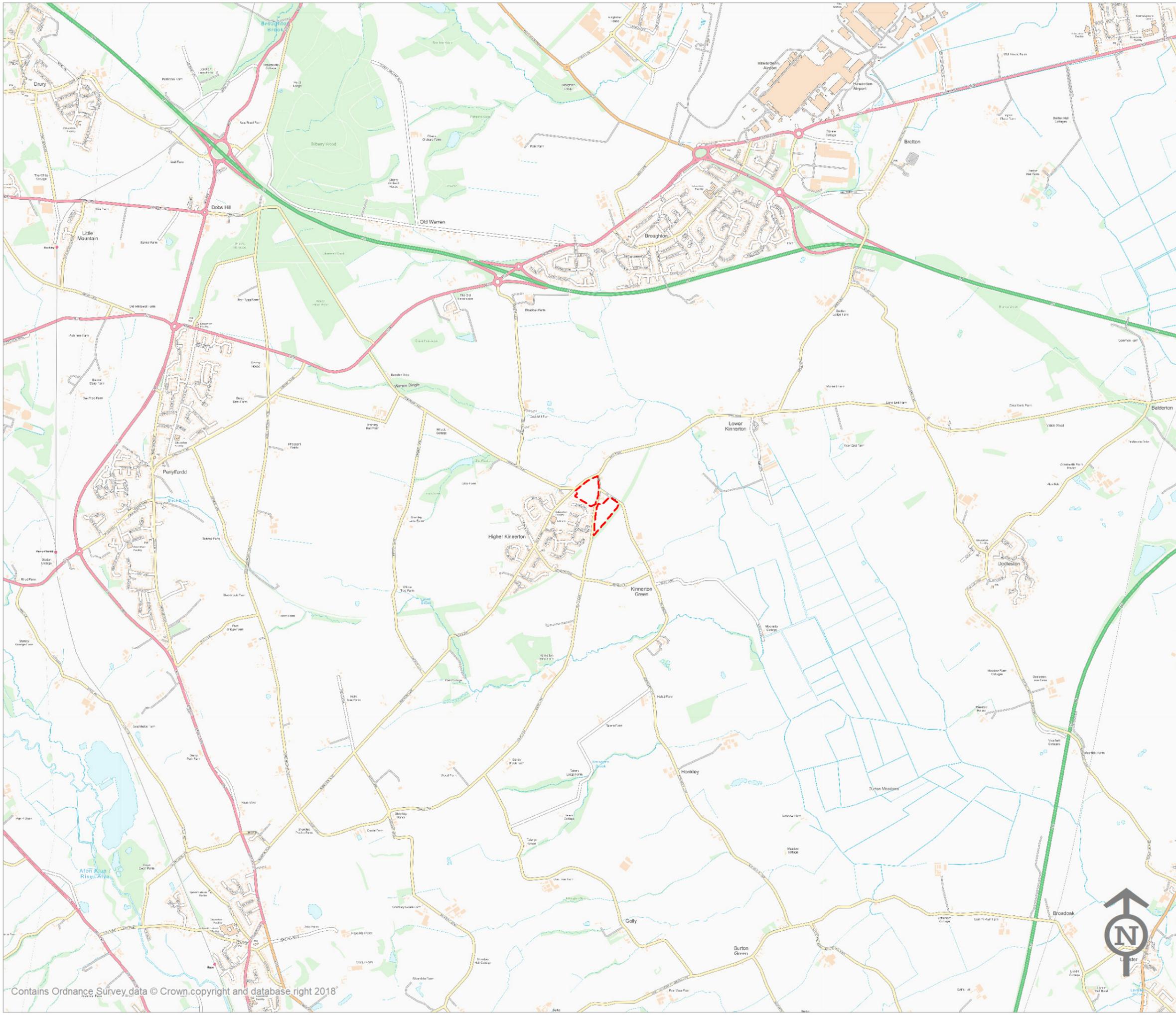


Figure 1b:
Site Plan Aerial

Figure 1b:
Site Plan Aerial

Map Ref: (NGR) 333422, 361462
Map Scale: 1:2,500 @ A3

KEY

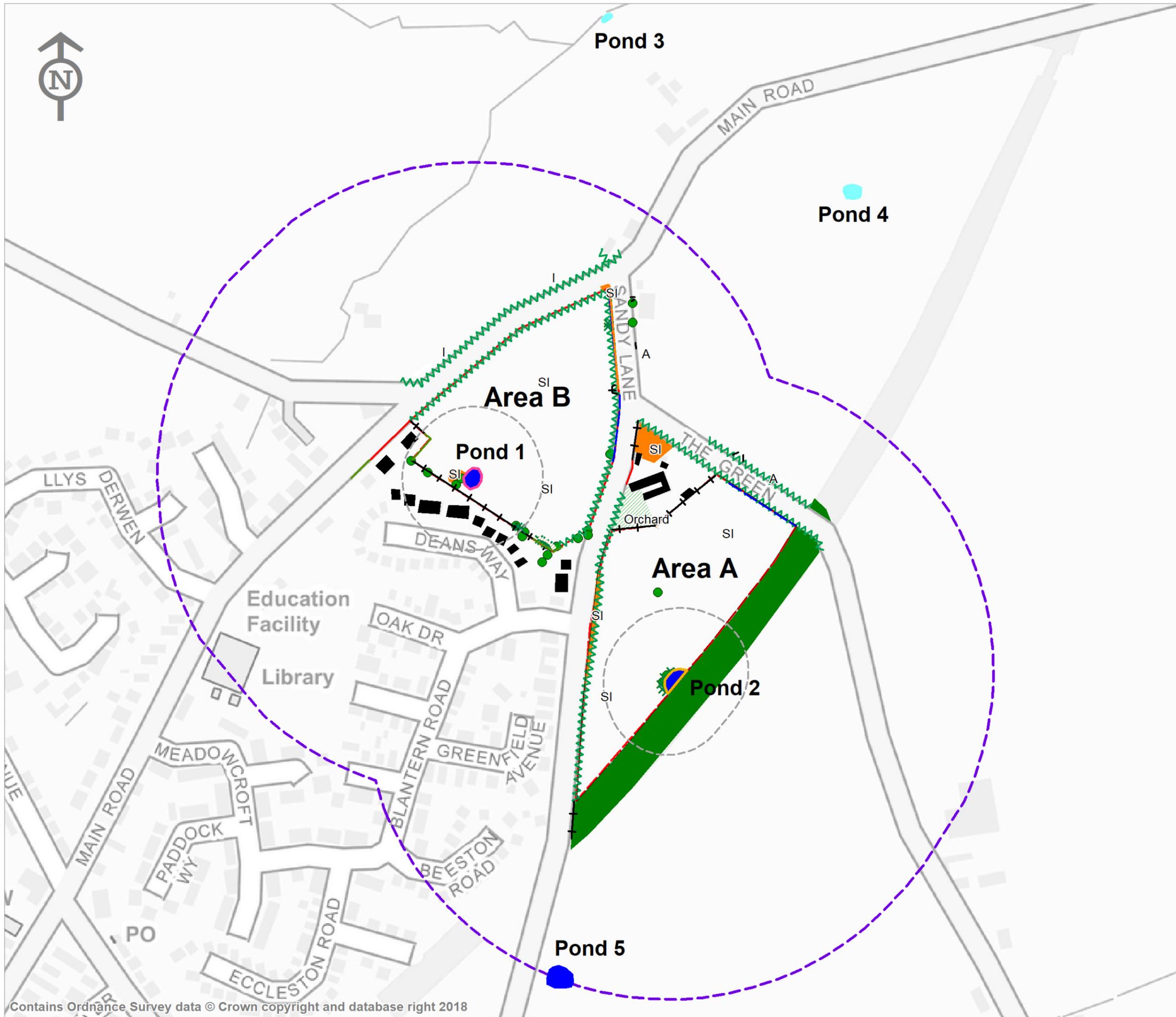
 Site boundary



Figure 2:
Pond Location Plan

Figure 2:
Pond Location Plan

Map Ref: (NGR) 333422, 361462
Map Scale: 1:2,900 @ A3



KEY

- Site boundary
- Confirmed great crested newt breeding pond 2016 & 2018
- Confirmed great crested newt breeding pond 2016
- Pond
- Dry / unsuitable pond
- Pond 50m buffer
- Pond 250m buffer

Phase 1 Habitats

- Broad-leaved woodland
- Orchard
- Scattered scrub
- Scattered tree (broad-leaved)
- Semi-improved grassland
- Improved grassland
- Poor semi-improved grassland
- Arable
- Species-rich hedgerow
- Species-poor hedgerow
- Fence
- Wall
- Dry ditch
- Building

Figure 3:
Fencing Plan

Figure 3: Temporary Amphibian Fence (TAF) Layout & Receptor Site

Map Ref: (NGR) 333422, 361462
Map Scale: 1:1,500 @ A3

KEY



Site boundary



Minimum trapping period of 30 days



External Temporary Amphibian Fence (TAF)



Internal Temporary Amphibian Fence (TAF)



Receptor site



Pond



**ecology
services**

Environmental Consultants



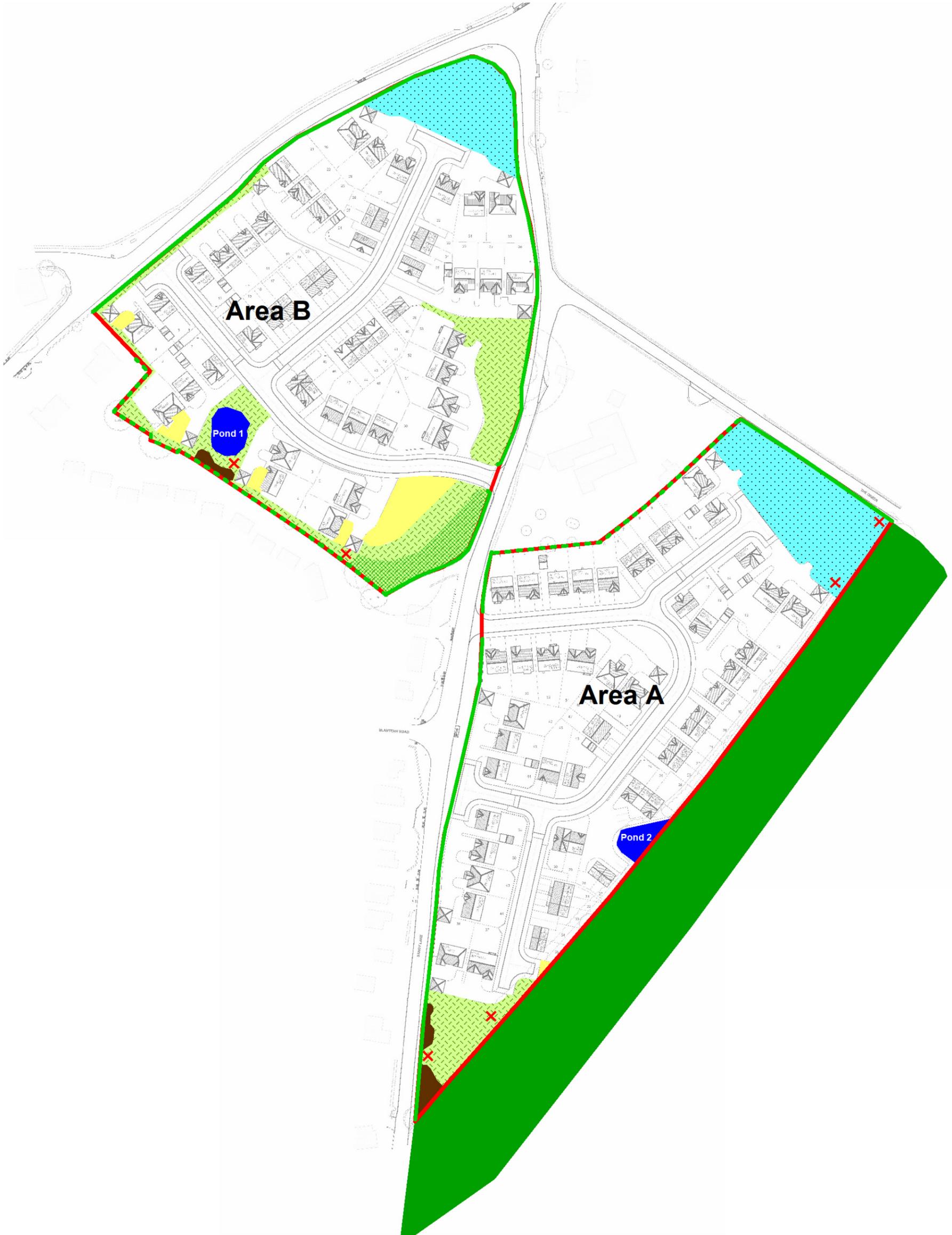
Figure 4:
Mitigation Plan

Figure 4: Mitigation Proposals

Map Ref: (NGR) 333422, 361462
Map Scale: 1:1,500 @ A3

KEY

- | | | |
|--|--|---|
|  Site boundary |  Existing woodland |  New scrub |
|  Pond |  Existing hedge (to be retained) |  SuDS |
|  Dedicated newt habitat |  New hedgerow |  Hibernacula |
|  Amenity grassland |  Existing scrub (to be retained) | |



Annex K1:
Pre-existing Survey Report

**SITE OFF MAIN ROAD,
HIGHER KINNERTON,
FLINTSHIRE, NORTH WALES -**

**GREAT CRESTED NEWT SURVEY,
AND MITGATION, HABITAT
ENHANCEMENT AND COMPENSATION
MEASURES
(JUNE 2016)**



ces ecology
consultant ecologists

**SITE OFF MAIN ROAD,
HIGHER KINNERTON,
FLINTSHIRE, NORTH WALES -**

**GREAT CRESTED NEWT SURVEY,
AND MITGATION, HABITAT ENHANCEMENT
AND COMPENSATION MEASURES
(JUNE 2016)**

Author:	J. Grundy	Date: 28/06/2016
Compiled by:	P Smith	Date: 29/06/2016
Checked by:	J Grundy	Date: 29/06/2016

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1.0 EXECUTIVE SUMMARY

- 1.1 Cheshire Ecological Services Ltd (CES) was commissioned to undertake a great crested newt (GCN) aquatic survey and terrestrial appraisal, assess the predicted development effect and formulate appropriate and proportionate GCN mitigation and habitat compensation measures in connection with proposed residential development on land located off Main Road, Higher Kinnerton, Flintshire, North Wales.
- 1.2 The survey was led by CES Senior Ecologist Faye Durkin BSc (Hons) MSc MCIEEM assisted by a team of ecologists from CES under the terms and conditions of a Natural Resources Wales GCN Survey Licence (Ref No: 62079:OTH:SA:2015) in accord with current survey guidance. Faye is fully conversant with the English Nature Great Crested Newt Mitigation Guidelines 2001, GCN survey methodologies and legislation relating to the species.
- 1.3 The GCN survey effort undertaken in respect of the proposed development included a site walk-over inspection visit on 15th March 2016, a detailed review of OS and aerial mapping, and consideration of biological and protected species data sourced from Cofnod (biological records centre for North Wales).
- 1.4 All water-bodies identified on OS and aerial mapping of the local area as potentially extant at or within 500 metres of the proposed development site were considered as part of the survey.
- 1.5 In total eight ponds and water bodies (Ponds 1, 2, 4, 5 & B and Water bodies 3, A & C) were identified as potentially extant at or within 500 metres of the development site during the site walkover inspection visit and review of OS and aerial mapping.
- 1.6 Based on the terrestrial range of individual GCN (generally <250 metres, occasionally >500 metres, rarely >1 kilometre from their breeding site) and given the availability of suitable aquatic and dispersal habitat it was concluded that Ponds 1 & 2 were relevant. Access permission was obtained for CES to survey both these ponds.
- 1.7 Following the site walkover inspection six non-consecutive GCN aquatic survey visits to Ponds 1 & 2 were undertaken between 22nd March and 17th May 2016. The survey methods employed included a combination of GCN egg search, torch survey, bottle trapping and hand netting, as appropriate to the conditions.

- 1.8 The proposed development site extends to approximately 2.4 hectares and comprises predominantly poor semi-improved grassland containing patches of bramble/scrub and tall ruderal (common nettle) bounded by hedgerows with a drainage ditch (dry) along the eastern boundary. Pond 2 is located within the site boundary. The site is set adjacent built urban environs to the south with Sandy Lane to the east and Main Road to the west with farmland beyond. The site is centred on OS grid reference SJ 3332 6161.
- 1.9 At the time of the survey terrestrial habitat to be directly impacted by the proposed development was assessed to offer GCN and other amphibians with limited shelter opportunities and foraging and dispersal habitat categorised by CES as predominantly 'Below Average'.
- 1.10 The survey robustly established GCN breeding presence at Ponds 1 & 2. The survey findings reliably indicate that a 'small' GCN population size class is associated with Ponds 1 and 2.
- 1.11 Given the survey findings it has been concluded that GCN are reasonably likely to be present within areas to be impacted by the proposed development.
- 1.12 As the proposed development will have a 'Medium' to 'High' negative impact on GCN and would be likely to result in a breach of legislation relating to the species it has been concluded that GCN pose a significant constraint to proposed development at the site.
- 1.13 Following careful consideration of the survey findings and given the scale of the development, the predicted negative development impacts, the legal protection afforded to the species and current guidance issued by Natural Resources Wales, it was concluded appropriate to recommend the implementation of Natural Resources Wales licensed GCN mitigation, habitat enhancement and compensation measures in respect of the proposed development.
- 1.14 CES has concluded that the GCN mitigation, habitat enhancement and compensation measures recommended and detailed in this report are in accordance with current Natural Resources Wales guidance and that their successful implementation would enable the proposed development to proceed lawfully and will ensure that the favourable conservation status of the GCN population/s associated with Ponds 1 & 2 and the local area are maintained and/or enhanced within their natural range

2.0 INTRODUCTION

- 2.1 Cheshire Ecological Services Ltd (CES) was commissioned to undertake a great crested newt (GCN) aquatic survey and terrestrial appraisal, assess the predicted development effect and formulate appropriate and proportionate GCN mitigation and habitat compensation measures in connection with the proposed residential development on land located off Main Road, Higher Kinnerton, Flintshire, North Wales (refer to Appendix A(i): Site Location Plan (OS) & Appendix A(ii): Site Location Plan (Aerial))
- 2.2 The survey was led by CES Senior Ecologist Faye Durkin BSc (Hons) MSc MCIEEM assisted by a team of ecologists from CES under the terms and conditions of a Natural Resources Wales GCN Survey Licence (Ref No: 62079:OTH:SA:2015) in accord with current survey guidance. Faye is fully conversant with the English Nature Great Crested Newt Mitigation Guidelines 2001, GCN survey methodologies and legislation relating to the species (refer to Appendix B: GCN Legislation).
- 2.3 The objective of the survey was to establish:
- The extent, status and relevance of aquatic and terrestrial habitats located at and within 500 metres of the proposed development site;
 - GCN presence/likely absence and population status at the site level and within the local area;
 - The predicted development effect and scale of impact on GCN;
 - The likely impact of development on the favourable conservation status of any GCN population/s associated with the local area;
 - Potential legal and licensing implications in respect of current wildlife legislation relating to GCN;
 - Appropriate GCN mitigation, habitat enhancement and compensation measures to address the predicted development effect and level of impact on GCN;
- 2.4 This report should enable the Local Planning Authority to make an informed decision as to whether or not it is possible to discharge their responsibilities under current planning guidance (Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning (2009)) in respect of GCN and biodiversity, when determining the planning application submitted in respect of the proposed development.

3.0 SURVEY METHODS

- 3.1 A GCN aquatic survey and terrestrial appraisal undertaken in respect of proposed development should be carried out by a suitably licensed ecologist and employ a combination of recognised methodologies, as detailed in The English Nature Great Crested Newt Mitigation Guidelines 2001 (EN GCN MG) and in accordance with current Natural Resources Wales survey guidance.
- 3.2 As part of the survey, the predicted development effect and scale of impact on GCN, breeding, shelter, foraging and dispersal habitat should be assessed and appropriate GCN mitigation and habitat compensation measures formulated.
- 3.3 The EN GCN MG indicate that a GCN survey may be necessary to check for the presence of the species if background information on distribution suggests that they may be present. Detailed indicators include:
- Any historical records for GCN on the site, or in the general area
 - A pond on or near the site (within around 500m), even if it holds water only seasonally. Note that muddy, cattle-poached, heavily vegetated or shaded ponds, ditches and temporary flooded hollows can be used by GCN
 - Sites with refuges (such as piles of logs or rubble), grassland, scrub, woodland, or hedgerows within five hundred metres of a pond
- 3.4 The EN GCN MG and Natural Resources Wales advise that, if access permission can be obtained, a GCN aquatic survey should consist of four or six visits, carried out on non-consecutive nights, in appropriate weather conditions, at the appropriate time of year (mid-March to mid-June) and should ideally include all of the water bodies identified as relevant within the survey area. At least half of the visits should be undertaken between mid-April and mid-May.
- 3.5 Natural Resources Wales advises that a GCN 'Habitat Suitability Index' score is calculated for all water bodies subject to a GCN survey (refer to Appendix C: GCN Survey Methods; Oldham *et al*, 2000).
- 3.6 The 'traditional' GCN aquatic survey methods include egg search, torch survey, bottle trapping and hand netting. The EN GCN MG and Natural Resources Wales advise that, where practicable to do so, a combination of three of the four traditional survey methods should be employed at each water body.

- 3.7 The EN GCN MG indicate that four non-consecutive visits, using traditional survey methods and resulting in consistent negative findings, undertaken in accordance with current GCN survey guidance represents sufficient effort to reliably establish GCN 'likely absence' at a water body.
- 3.8 The EN GCN MG advise that a GCN population size class assessment aquatic survey (generally required to inform a GCN mitigation licence application) should comprise six non-consecutive visits, using traditional survey methods, at the appropriate time of year (mid-March to mid-June) to all the water bodies within the survey area where GCN presence has been established. At least three of the visits should be undertaken between mid-April and mid-May.
- 3.9 The GCN population size class is derived from the peak count. This is the combined sum of the highest number of adult GCN observed or captured during the same visit. GCN population size class based on the EN GCN MG categorisations are shown below.
- Small population size class: 1 to 10 individual adult GCN
 - Medium population size class: 11 to 100 individual adult GCN
 - Large population size class: 100 plus individual adult GCN
- 3.10 GCN presence or 'likely absence' can also be reliably established at a water body between mid-April and the end of June using the Natural Resources Wales approved eDNA analysis method; whereby samples of the surveyed water body are collected by a suitably trained ecologist and analysed by an approved agent for the presence of GCN DNA.
- 3.11 The GCN survey effort undertaken in respect of the proposed development included a site walk-over inspection visit on 15th March 2016, a detailed review of OS and aerial mapping, and consideration of biological and protected species data sourced from Cofnod (biological records centre for North Wales).
- 3.12 All water-bodies identified on OS and aerial mapping of the local area as potentially extant at or within 500 metres of the proposed development site were considered as part of the survey.

- 3.13 In total eight ponds and water bodies (Ponds 1, 2, 4, 5 & B and Water bodies 3, A & C). were identified as potentially extant at or within 500 metres of the development site during the site walkover inspection visit and review of OS and aerial mapping.
- 3.14 Based on the terrestrial range of individual GCN (generally <250 metres, occasionally >500 metres, rarely >1 kilometre from their breeding site) and given the availability of suitable aquatic and dispersal habitat it was concluded that Ponds 1 & 2 were relevant. Access permission was obtained for CES to survey both these ponds.
- 3.15 Ponds 4, 5 & B and Water bodies 3, A & C were excluded from the survey on the grounds of their distance from the site, restricted habitat connectivity or because they did not offer GCN with suitable breeding habitat i.e. streams, brooks or flowing ditches.
- 3.16 Following the site walkover inspection six non-consecutive GCN aquatic survey visits to Ponds 1 & 2 were undertaken between 22nd March and 17th May 2016. The survey methods employed included a combination of GCN egg search, torch survey, bottle trapping and hand netting, as appropriate to the conditions.
- 3.17 As part of the survey, the predicted development effect on GCN and their breeding, shelter, foraging and dispersal habitat was assessed and appropriate GCN mitigation and habitat compensation measures were formulated.

4.0 SURVEY AREA DESCRIPTION

- 4.1 The proposed development site extends to approximately 2.4 hectares and comprises predominantly poor semi-improved grassland containing patches of bramble/scrub and tall ruderal (common nettle) bounded by hedgerows with a drainage ditch (dry) along the eastern boundary. Pond 2 is located within the site boundary. The site is set adjacent built urban environs to the south with Sandy Lane to the east and Main Road to the west with farmland beyond. The site is centred on OS grid reference SJ 3332 6161 (refer to Appendix D: Photographic Plates).

4.2 The habitat types at the proposed development site, their extent and suitability for GCN and other amphibians are detailed in Table 1 below:

Table 1: Proposed Development Site Habitat Type, Extent & GCN/Amphibian Suitability

Habitat type	Approximate Total Area (Ha)/length	Suitability for GCN/Amphibians
Poor semi- improved grassland	2.3Ha	Below Average
Bramble/scrub	0.05Ha	Good
Tall Ruderal	0.03Ha	Average
Hedgerows	430m	Above Average
Drainage ditch (dry)	200m	Above Average
Pond	0.02Ha	Aquatic habitat

4.3 At the time of the survey terrestrial habitat to be directly impacted by the proposed development was assessed to offer GCN and other amphibians with limited shelter opportunities and foraging and dispersal habitat categorised by CES, as predominantly 'Below Average'.

4.4 The terrestrial habitat suitability categorisations used by CES are based on the Terrestrial Habitat Suitability Index (THSI) developed by James Grundy ACIEEM (Principal Ecologist) and Faye Davies BSc (Hons) MSc MCIEEM (Senior Ecologist). The THSI is necessarily a broad interpretative tool that can only provide general guidance when categorising the suitability of terrestrial habitat for GCN/amphibians. The THSI relies implicitly on the experience and professionalism of the ecologist using the Index for consistency and accuracy. The THSI has been developed to help standardise GCN/amphibian terrestrial habitat assessments/categorisations and provide more accurate and consistent data to help inform the decision-making process relating to GCN/amphibian mitigation projects (refer to Appendix E: Terrestrial Habitat Suitability Index).

4.5 A brief description of the aquatic habitats at Ponds 1 & 2 is provided below.

Pond 1:

Approximate area 0.01ha water depth >0.5m, overlying an indeterminate depth of silt. This pond was located approximately 180 metres to the south east of the proposed development site boundary and set within poor semi-improved grassland. The pond was heavily shaded by willow and supported a limited

variety of aquatic/emergent plant species and a poor diversity of aquatic invertebrates. Fish presence was considered unlikely and limited waterfowl impacts were observed during the survey period. It was concluded that this pond rarely dries.

Pond 2:

Approximate area 0.02ha water depth >0.5m, overlying an indeterminate depth of silt. This pond was located within the proposed development site boundary and set within poor semi improved grassland. The pond was not shaded and supported a variety of aquatic/emergent plant species and a poor diversity of aquatic invertebrates. Fish presence was considered unlikely and no significant waterfowl impacts were observed during the survey period. It was concluded that this pond sometimes dries.

4.6 As part of the survey a GCN ‘Habitat Suitability Index’ assessment was carried out at Ponds 1 & 2. The scores calculated for each water body are detailed in Table 2 below.

Table 2: HSI scores/categorisation

Water body Ref:	Pond 1	Pond 2
SI1 - Location	1	1
SI2 - Pond area	0.2	0.4
SI3 - Pond drying	1	0.5
SI4 - Water quality	0.33	0.33
SI4 - Shade	0.3	1
SI6 - Fowl	0.67	1
SI7 - Fish	1	1
SI8 - Ponds	0.9	0.9
SI9 - Terr'l habitat	0.67	0.67
SI10 - Macrophytes	0.3	0.9
HSI	0.55	0.72
Categorisation	Below Average	Good

NB: <0.5 poor, 0.5-0.59 below average, 0.6-0.69 average, 0.7-0.79 good, >0.8 excellent

- The ‘HSI’ assessment score calculated for Pond 1 was 0.55 and indicated ‘Below Average’ suitability for GCN.
- The ‘HSI’ assessment score calculated for Pond 2 was 0.72 and indicated ‘Good’ suitability for GCN.

- 4.7 During the walk-over inspection visit and assessment of aerial mapping, it was noted that several private gardens are located within 500 metres of the proposed development site. It is known that some of these gardens contain ponds or ornamental water features potentially used by GCN or other amphibians. However, given the extensive experience of CES with similar projects, it was not considered logistically achievable to establish the presence of and/or incorporate neighbouring gardens and any associated ponds or ornamental water features into the survey.
- 4.8 The potential presence of GCN and other amphibians within neighbouring gardens and their potential use of ponds or ornamental water features and terrestrial garden habitat (as detailed in the publication 'Newts in your Pond and Garden', Grundy 2007) was fully considered when assessing the predicted development effect and scale of impact, and formulating appropriate mitigation and compensation measures.

5.0 SURVEY RESULTS

- 5.1 The significant GCN survey effort expended by ecological consultancies and various conservation groups/organisations in the Flintshire area, since the early 1980s, has established that the local status of GCN can best be categorised as: frequent and widespread.
- 5.2 The GCN population size class associated with the majority of GCN breeding sites in the Flintshire area can be typically categorised as 'small' to 'medium'.
- 5.3 The occurrence of breeding sites supporting a 'large' GCN population size class is considered to be atypical and unusual. However, as a consequence of the widespread status of the species within Flintshire it is not unusual for 'small' or 'medium' GCN populations associated with a breeding site to form part of large GCN 'meta-populations'.
- 5.4 The biological and protected species data sourced from Cofnod (biological records centre for North Wales) provided several records of GCN located within 2km of the proposed development site since 1995.

- 5.5 The main findings of the CES 2016 GCN Survey are detailed below (see also Tables 3 and 4: GCN Survey Results):
- i. GCN eggs and leaf folds were found in Ponds 1 & 2.
 - ii. A peak count of six adult GCN was recorded at Pond 1.
 - iii. A peak count of two adult GCN was recorded at Pond 2.
 - iv. The combined peak count of adult GCN at Ponds 1 & 2 was six.
 - v. The presence of adult smooth newt was established at Ponds 1 & 2.
 - vi. The presence of adult palmate newt was established at Pond 1.
 - vii. The presence of common frog was established at Ponds 1 & 2.
 - viii. The survey robustly established GCN breeding presence at Ponds 1 & 2.
 - ix. The survey findings reliably indicate that a 'small' GCN population size class is associated with Ponds 1 and 2.
 - x. At the time of the survey terrestrial habitat to be directly impacted by the proposed development was assessed to offer GCN and other amphibians with limited shelter opportunities and foraging and dispersal habitat categorised by CES as predominantly 'Below Average'.
 - xi. Given the survey findings it has been concluded that GCN are reasonably likely to be present within areas to be impacted by the proposed development.
- 5.6 Based on the survey findings it was concluded that sufficient information was available to allow the predicted development effect and scale of impact on GCN to be reliably assessed.

Table 3: GCN Survey Results (Pond 1)

Survey visits undertaken by CES ecologists: Faye Davies, John Turner, John Harding, Amy Green, Natasha Firth and Lindsay Overstall																				
Pond reference: Pond 1					Method:	Torch			Bottle-trap			Net			Egg search	Larvae				
No. of survey visits to this pond:					6	Torch power:			No. of traps used in pond:						GCN eggs found?	larvae found? (any method)				
Great Crested Newt:					Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.						
(1) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	1	0	NA	NA	NA	0	0		Yes	No				
22/03/2016	8		2	1	Adult totals:	1			x			0								
(2) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	1	0	NA	NA	NA	0	0		N/A	No				
05/04/2016	8		2	1	Adult totals:	1			x			0								
(3) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	0	0	0	0	0		N/A	No				
12/04/2016	10		2	1	Adult totals:	0			0			0								
(4) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		2	3	0	2	0	0	0	0		N/A	No				
19/04/2016	9		2	1	Adult totals:	5			2			0								
(5) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		3	3	0	1	0	0	0	0		N/A	No				
09/05/2016	17		2	1	Adult totals:	6			1			0								
(6) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		3	2	0	2	2	0	0	0		N/A	No				
17/05/2016	12		2	1	Adult totals:	5			4			0								
GCN Peak adult count for this pond in any one visit (by torch, trap or net):										6										
Smooth Newt:																				
	Torch			Bottle Trap			Net			Eggs/Larvae										
	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.											
Visit 1	1	4	0	x	x	x	0	0	0	Eggs only										
Visit 2	1	0	0	x	x	x	0	0	0	N/A										
Visit 3	0	0	0	2	3	0	0	0	0	N/A										
Visit 4	0	0	0	0	0	0	0	0	0	N/A										
Visit 5	1	9	0	3	1	0	0	0	0	N/A										
Visit 6	2	5	0	0	0	0	0	0	0	N/A										
Other amphibians:																				
	Palmate Newt					Common Frog					Common Toad					Natterjack Toad				
Visit 1	Not found					Not found					Not found					Not found				
Visit 2	Not found					Not found					Not found					Not found				
Visit 3	1-10 adults; no eggs or larvae					Not found					Not found					Not found				
Visit 4	1-10 adults; no eggs or larvae					Not found					Not found					Not found				
Visit 5	1-10 adults; no eggs or larvae					No adults; eggs or larvae only					Not found					Not found				
Visit 6	1-10 adults; no eggs or larvae					Not found					Not found					Not found				
Comments:																				
All visits w eather suitable for GCN survey (air temp above 5c, little/no w ind, no or only intermittent light show ers). Veg cover and relatively clear w ater allow ed torch survey effort (albeit constrained by restricted access). Availability of suitable egg laying substrate enabled GCN egg/leaf fold search effort in accordance w ith the EN GCN MG. Restricted access limited the deployment of bottle traps. Some limited hand netting w as carried out albeit limited to avoid undue disturbance.																				
Notes: Temperature = Deg C.; Vegetation cover score (0-5); 0 = no vegetation obscuring survey; 5 = vegetation completely obscuring survey; Turbidity score (0-5); 0 = completely clear; 5 = very turbid.x =Method not used																				

Table 4: GCN Survey Results (Pond 2)

Survey visits undertaken by CES ecologists: Faye Davies, John Turner, John Harding, Amy Green, Natasha Firth and Lindsay Overstall																
Pond reference: Pond 2					Method:	Torch Torch power: ≥ 1,000,000 cp			Bottle-trap No. of traps used in pond: x			Net			Egg search	Larvae
No. of survey visits to this pond: 6					Sex/life stage:	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.	GCN eggs found?	found? (any method)
Great Crested Newt:																
(1) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	NA	NA	NA	0	0	0	No	No
22/03/2016	8		4	1	Adult totals:	0			x			0				
(2) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	NA	NA	NA	0	0	0	No	No
05/04/2016	8		3	1	Adult totals:	0			x			0				
(3) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	0	0	0	0	0	0	Yes	No
12/04/2016	10		3	1	Adult totals:	0			0			0				
(4) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	0	0	0	0	0	0	N/A	No
19/04/2016	9		3		Adult totals:	0			0			0				
(5) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	0	0	0	0	0	0	N/A	No
09/05/2016	17		4	1	Adult totals:	0			0			0				
(6) Date: (Set/Ret)	Air temp	Water Temp	Veg cover	Turbidity		0	0	0	0	2	0	0	0	0	N/A	No
17/05/2016	12		4	1	Adult totals:	0			2			0				
GCN Peak adult count for this pond in any one visit (by torch, trap or net):									2							
Smooth Newt:																
	Torch			Bottle Trap			Net			Eggs/Larvae						
	Male	Female	Imm.	Male	Female	Imm.	Male	Female	Imm.							
Visit 1	1	1	0	0	0	0	0	0	0	Eggs only						
Visit 2	0	0	0	0	0	0	0	0	0	Eggs only						
Visit 3	0	0	0	1	0	0	0	0	0	Eggs only						
Visit 4	0	0	0	0	0	0	0	0	0	N/A						
Visit 5	0	0	0	14	1	0	0	0	0	N/A						
Visit 6	0	0	0	0	0	0	0	0	0	N/A						
Other amphibians:																
	Palmate Newt			Common Frog			Common Toad			Natterjack Toad						
Visit 1	Not found			1-10 adults; no eggs or larvae			Not found			Not found						
Visit 2	Not found			1-10 adults; no eggs or larvae			Not found			Not found						
Visit 3	Not found			No adults; eggs or larvae only			Not found			Not found						
Visit 4	Not found			Not found			Not found			Not found						
Visit 5	Not found			1-10 adults; no eggs or larvae			Not found			Not found						
Visit 6	Not found			Not found			Not found			Not found						
Comments:																
All visits weather suitable for GCN survey (air temp above 5c, little/no wind, no or only intermittent light showers). Veg cover and relatively clear water allowed torch survey effort (albeit constrained by veg cover). Availability of suitable egg laying substrate enabled GCN egg/leaf fold search effort in accordance with the EN GCN MG. Restricted access limited the deployment of bottle traps. Some limited hand netting was carried out albeit limited to avoid undue disturbance.																
Notes: Temperature = Deg C.; Vegetation cover score (0-5); 0 = no vegetation obscuring survey; 5 = vegetation completely obscuring survey; Turbidity score (0-5); 0 = completely clear; 5 = very turbid. x = Method not used																

6.0 PREDICTED DEVELOPMENT EFFECT & SCALE OF IMPACT

- 6.1 No GCN breeding sites or other water bodies will be lost as a consequence of the proposed development.
- 6.2 Pond 2 will be retained, albeit the pond will be subject to some temporary disturbance as a consequence of the proposed development.
- 6.3 The proposed development will not significantly increase the historic and existing level of habitat fragmentation at the site level.
- 6.4 The proposed development is considered likely to increase (from current and historic levels) the risk of post-development human interference impacts on the GCN population/s associated with Ponds 1 and 2 and the local area.
- 6.5 The predicted development effect and scale of impact has been assessed with reference to the EN GCN MG (2001) and current guidance.
- 6.6 It is considered that the proposed development will result in some; partial destruction, temporary disturbance and/or temporary destruction followed by reinstatement and modified management of features classified, by the EN GCN MG, as immediate, intermediate and distant terrestrial habitat. Consequently, the predicted scale of negative impact on GCN (in the absence of any mitigation measures) can be categorised as 'Medium to High'.
- 6.7 The predicted development effect and impacts are detailed/highlighted (blue) in Table 5 below (adapted from the EN GCN MG).

Table 5: Summarising the scale of main impacts on GCN at the site level

Habitat Feature	Development Effect	Scale of Impact		
		Low	Medium	High
Confirmed GCN breeding pond/water body	Destruction			P
	Isolation caused by fragmentation			P
	Partial destruction; modification		P	
	Temporary disturbance	P		
	Post-development interference			P
Other pond or water body	Destruction		P	
	Isolation caused by fragmentation		P	
	Partial destruction; modification	P		
	Temporary disturbance	P		
	Post-development interference	P		
Immediate Terrestrial Habitat (less than 50 metres from a GCN/breeding pond or other water body potentially used by the species)	Destruction			P
	Isolation caused by fragmentation			P
	Partial destruction		P	
	Modified management, resurfacing etc.		P	
	Temporary disturbance	P		
	Post-development interference		P	
	Temporary destruction & reinstatement	P		
Intermediate Terrestrial Habitat: (at a distance of 50 metres up to 250 metres from a GCN/breeding pond or other water body potentially used by the species)	Destruction		P	
	Isolation caused by fragmentation		P	
	Partial destruction	P		
	Modified management, resurfacing, etc.	P		
	Temporary disturbance	P		
	Post-development interference	P		
	Temporary destruction & reinstatement	P		
Distant Terrestrial Habitat (more than 250 metres from a GCN/breeding pond or other water body potentially used by the species)	Destruction	P		
	Isolation caused by fragmentation	P		
	Partial destruction	P		
	Modified management, resurfacing etc.	P		
	Temporary disturbance	P		
	Post-development interference	P		
	Temporary destruction & reinstatement	P		

6.8 As the proposed development will have a ‘Medium’ to ‘High’ negative impact on GCN and would be likely to result in a breach of legislation relating to the species it has been concluded that GCN pose a significant constraint to proposed development at the site.

6.9 Following careful consideration of the survey findings and given the scale of the development, the predicted negative development impacts, the legal protection afforded to the species and current guidance issued by Natural Resources Wales, it was concluded appropriate to recommend the implementation of Natural Resources Wales licensed GCN mitigation, habitat enhancement and compensation measures in respect of the proposed development.

7.0 RECOMMENDED GCN MITIGATION, HABITAT ENHANCEMENT AND COMPENSATION MEASURES

- 7.1 CES has concluded that the GCN mitigation, habitat enhancement and compensation measures recommended and detailed in this report are in accordance with current Natural Resources Wales guidance and that their successful implementation would enable the proposed development to proceed lawfully and will ensure that the favourable conservation status of the GCN population/s associated with Ponds 1 & 2 and the local area are maintained and/or enhanced within their natural range (refer to Appendix F(i) - Habitat Compensation Plan & Appendix F(ii) - Amphibian Hibernacula Design).
- a) Given the legal protection afforded to the species and current guidance issued by Natural Resources Wales, it has been concluded that it will be necessary to obtain a Natural Resources Wales GCN development/mitigation licence in order to allow the proposed development and GCN mitigation, habitat enhancement and compensation works to proceed lawfully.
 - b) The Natural Resources Wales GCN development/mitigation licence application will contain full details of the GCN mitigation, habitat enhancement, and compensation measures proposed including appropriate bio-security measures, independent ecological compliance auditing proposals and details of future site monitoring and wardening.
 - c) It will be for Natural Resources Wales to decide, based on set criteria, (including the licensing tests), whether or not a GCN development/mitigation licence can be issued in respect of any development proposals brought forward for the site.
 - d) It should be noted that Natural Resources Wales will not determine a GCN development/mitigation licence application until full planning consent has been granted.
 - e) In this instance it has been concluded that sufficient scope exists to proportionately mitigate for the presence of GCN and successfully implement appropriate habitat enhancement and compensation measures that will

quantitatively, qualitatively and contextually address the predicted negative development impacts via a combination of on-site and off-site measures.

- f) Given the limited size of the proposed development site the implementation of full onsite GCN habitat compensation measures are not considered to be appropriate, economically viable, ecologically achievable or necessary.
- g) To safeguard the GCN population/s associated with Ponds 1 & 2 and the local area and appropriately address the predicted post development indirect negative human interference and recreation impacts of the proposed development a commuted sum (indicatively £47,600 based on 56 new dwellings) will be lodged by the developer with the charity Building Wildlife immediately prior to the commencement of development works at the site.
- h) The sum calculated in respect of the proposed development is based on a similar consented Natural Resources Wales GCN licensed development Project at 'Bon Accord' where a commuted sum of £850.00 per dwelling was agreed/paid to address development impacts on GCN.
- i) Building Wildlife has been set up as a holding body for such commuted sums. In this instance they will review and assess potential projects and allocate the commuted sum or parts thereof (in consultation with Natural Resources Wales and Flintshire County Council) to appropriately accredited organisations in order to fund GCN aquatic and terrestrial habitat creation and/or enhancement and/or monitoring and/or education projects (including the Deeside and Buckley Newt Sites SAC) over a 3-5 year period.
- j) The main objective of Building Wildlife will be to use the commuted sum to raise the conservation status of GCN population/s within the local area from unfavourable to favourable as part of a strategic and composite approach to GCN conservation. This approach is broadly supported by Natural Resources Wales and Flintshire County Council.
- k) For a 'small' GCN population size class the EN GCN MG indicate that a GCN mitigation strategy involving a trapping period encompassing 30 trapping nights at the proposed development site would be appropriate and likely to be approved and licensed by Natural Resources Wales.

- l) No development or mitigation related works should commence at the site until the Natural Resources Wales licence application has been determined, the licence received and all necessary GCN mitigation measures successfully implemented and relevant licence conditions complied with.

- m) On receipt of the Natural Resources Wales development/mitigation licence, the proposed development site will be cleared of GCN using the licensed methods. This will involve the exclusion, capture and translocation of any GCN and other amphibians from the development site using temporary amphibian fencing (TAF), drift fencing, pitfall traps, carpet refugia, torch and hand searches.

- n) All captured GCN and other amphibians to be moved from the development site will be released into suitable cover within the wildlife and public open space area to be established adjacent Pond 2. This area will extend to approximately 0.28Ha and will be enhanced by the provision of 4 GCN hibernacula (to be constructed in accord with the EN GCN MG design specification) and UK native species planting (of local provenance).

- o) Pond 2 (0.02Ha) located within the proposed development site boundary is to be retained and will be subject to aquatic enhancement works prior to the commencement of the GCN capture programme. The pond works proposed will include the removal and active control of aquatic vegetation to create areas of open water within the pond (used preferentially by adult GCN for breeding display and GCN larvae for feeding).

- p) Pond 2 will also be subject to mechanical desilting works (where safe/low impact access to the pond bank is possible). Material arising from these works will be carefully feathered into suitable adjacent terrestrial habitat under ecological supervision to prevent any inadvertent habitat damage. The pond works would be carried out during the winter months under GCN Reasonable Avoidance Measures (RAM) and bio-security protocols (in conjunction with the GCN licensed elements of the proposed development) in accordance with current best practice guidance relating to aquatic habitat works at GCN breeding sites. It is anticipated that the pond works will take approximately 3 days to complete.

- q) The aim of the aquatic habitat enhancement works at Pond 2 (in accordance with the EN GCN MG) will be to create a pond with:
- Limited shading on the southern bank.
 - Approximately 50% aquatic/marginal plant cover;
 - Areas of open water;
 - Varied water depths (<4 metres);
 - Surface area > 0.02Ha;
 - Good populations of aquatic invertebrates and amphibians;
 - Absence of non-native invasive plant species,
 - Absence of fish;
 - Absence or low density of waterfowl.
- r) When the pond enhancement works are complete Pond 2 should achieve a HSI score >0.8 indicating 'Excellent' suitability for GCN.
- s) GCN and other amphibians will be prevented from entering the development site by the exclusion TAF to be installed around the entire perimeter of the development site. The perimeter exclusion TAF will remain in-situ and be maintained in good order until all development related works at the site are complete. Following completion of development works at the site the perimeter TAF will be removed.
- t) Within the development footprint habitat connectivity with Pond 1 & 2 and the local area will be maintained by the retention of existing site boundary hedgerows extending to 430 metres in length and the proposed planting of 130 metres of new hedgerow along the development site's southern boundary.
- u) Habitat connectivity measures within the development footprint will also include, where practicable to do so, the installation of amphibian friendly drainage/road features, i.e. offset gully pots, porous paving/hard-standing and dropped kerbs.
- v) To help inform appropriate future management/maintenance works within the wildlife and public open space area at the site a detailed Habitat Management Plan will be produced by CES following the grant of planning permission. The management plan will cover:

- a. *Aquatic habitat management*
 - b. *GCN population and habitat monitoring;*
 - c. *GCN terrestrial habitat management;*
 - d. *Hedgerow maintenance;*
 - e. *Mature tree maintenance;*
 - f. *Disturbance/damage of habitats and/or wildlife at/neighbouring the site by the public;*
 - g. *Bio-security; accidental/deliberate introduction at/neighbouring the site of fish and/or non-native species; and*
 - h. *Littering, fly tipping and pollution incidents.*
- w) Monitoring of Ponds 1 & 2 and the development footprint to assess aquatic and terrestrial habitat status and any requirement for remedial or management works will be required, as a condition of the Natural Resources Wales development/mitigation licence, for a minimum of four years post-development.
- x) The monitoring visits should be carried out by suitably experienced and licensed ecologists. The results obtained will provide information on the success of the GCN mitigation, habitat enhancement and compensation measures and will allow management issues to be identified and addressed.
- y) The developer will be responsible for adequately resourcing and ensuring the successful implementation of the GCN mitigation, habitat enhancement and compensation measures and monitoring detailed above.
- z) Appropriate resources will be made available by the developer to ensure that all licensed and required future habitat management and GCN monitoring works at the site are successfully delivered.
- aa) The developer will be responsible for implementing any additional management works identified as necessary to ensure that the favourable conservation status of the species is maintained within its natural range.
- bb) Funding for required post development habitat management and GCN monitoring and wardening works at the wildlife and public open space area within the development footprint will be made available via a management company to be appointed by the developer to collect the annual ground rents proposed to be levied 'in-perpetuity' on each of the new dwellings.

- 7.2 It is considered that the GCN mitigation, habitat enhancement and compensation measures proposed and detailed in this report accord with Article 2:2 of the Habitats Directive which states '*the purpose of the Habitats Directive is: to restore the favourable conservation status of European habitat and species*'. They also accord with the provisions of Regulations 9 (1) '*The appropriate authority and the nature conservation bodies must exercise their functions under the enactments relating to nature conservation so as to secure compliance with the requirements of the Habitats Directive and 9 (5). Without prejudice to the preceding provisions, a competent authority, in exercising any of their functions, must have regard to the requirements of the Habitats Directive so far as they may be affected by the exercise of those functions*'.
- 7.3 It is considered that a Natural Resources Wales GCN mitigation/development licence application submitted in respect of the proposed development would be likely to satisfy the Habitats Directive Article 16 derogation purpose and the statutory tests.
- 7.4 Consequently it is considered reasonable to conclude that a Natural Resources Wales GCN mitigation/development licence would be likely to be granted in respect of the proposed development should planning consent be granted.

8.0 CONCLUSIONS

- 8.1 The status of GCN and other amphibians at the site level has been reliably established, the predicted development effect and scale of impact have been assessed and appropriate mitigation, habitat enhancement and compensation measures have been formulated.
- 8.2 As the proposed development will have a 'Medium' to 'High' negative impact on GCN, and would be likely to result in a breach of legislation relating to the species it has been concluded that GCN pose a significant constraint to proposed development at the site.
- 8.3 Following careful consideration of the survey findings and given the scale of the development, the predicted negative development impacts, the legal protection afforded to the species and current guidance issued by Natural Resources

Wales, it was concluded appropriate to recommend the implementation of Natural Resources Wales licensed GCN mitigation, habitat enhancement and compensation measures in respect of the proposed development.

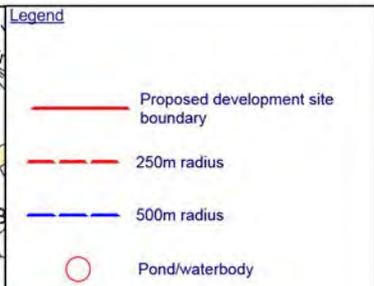
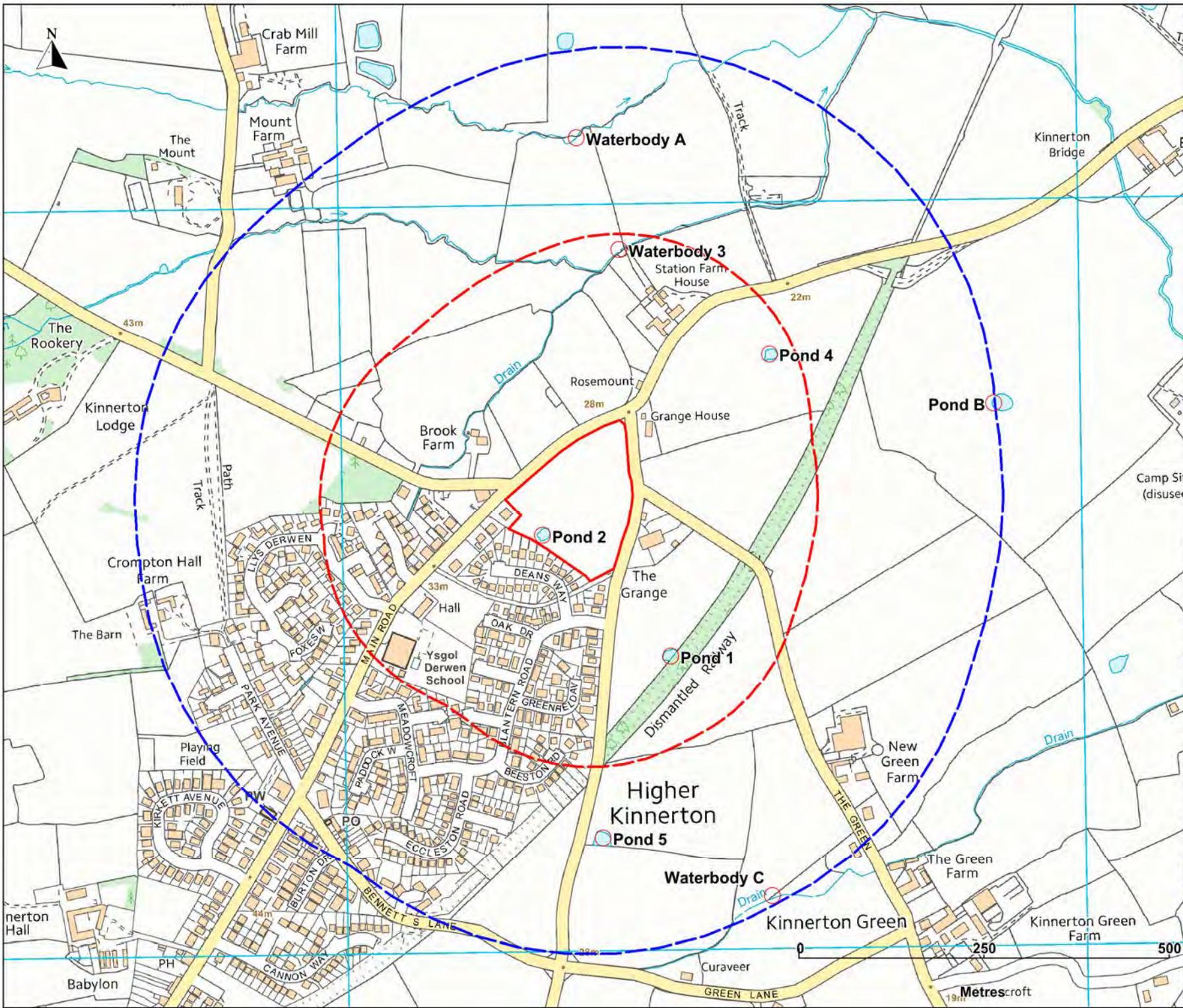
- 8.4 CES has concluded that the GCN mitigation, habitat enhancement and compensation measures recommended and detailed in this report are in accordance with current Natural Resources Wales guidance and that their successful implementation would enable the proposed development to proceed lawfully and will ensure that the favourable conservation status of the GCN population/s within the local area are maintained and enhanced within their natural range
- 8.5 It should therefore be possible for the Local Planning Authority to make an informed decision as to whether or not it is possible to discharge their responsibilities under current planning guidance, relating to GCN and biodiversity, by the implementation of planning condition/s when determining the planning application submitted in respect of the proposed development.

9.0 REFERENCES

- *English Nature (2001) Great Crested Newt Mitigation Guidelines. Peterborough: English Nature.*
- *Planning Policy Wales Technical Advice Note 5: Nature Conservation and Planning (2009)*
- *Oldham et al. (2000) Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus). Herpetological Journal 10(4), 143-155.*
- *Grundy, J. (2007) Newts in your Pond and Garden. Buxton Press Ltd.*
- *Natural England (2010) Advice Note European Protected Species & The Planning Process Natural England's Application of the 'Three Tests' to Licence Applications NE 292 WML-G24 (01/11)*
- *DEFRA published (2014) eDNA survey Technical Advice Note WC1067: Appendix 5 technical advice note for field & laboratory sampling of great crested newt (Triturus cristatus) environmental DNA.*

Appendices

Appendix A (i): Site Location Plan (OS)



Client:	Renew Land Development Ltd
Project:	Site off Main Road, Higher Kinnerton
Map:	Site Location Plan OS
CES Ref:	CES/1214/07-15/LO
Scale:	Not to scale / Indicative
Date/Rev:	June 2016 0

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 SY14 8EF



Appendix A (ii): Site Location Plan (Aerial)



Legend

- — — Proposed development site boundary
- - - 250m radius
- - - 500m radius
- Pond/waterbody

Client:	Renew Land Development Ltd	
Project:	Site off Main Road, Higher Kinnerton	
Map:	Site Location Plan Aerial	
CES Ref:	CES/1214/07-15/LO	
Scale:	Not to scale / Indicative	
Date/Rev:	June 2016	0



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 Bickley Hall Farm
 Bickley
 Malpas
 Cheshire
 SY14 8EF

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Appendix B: GCN & Protected Species Legislation

Species/Habitat	Protected by:	UK BAP
Common frog	Provision 5 of Section 9 of the <i>Wildlife and Countryside Act, 1981</i> (as amended)	No
Common toad	Provision 5 of Section 9 of the <i>Wildlife and Countryside Act, 1981</i> (as amended) Section 41 of the <i>Natural Environment and Rural Communities (NERC) Act, 2006</i>	Yes
Great crested newt	Regulation 41 of <i>The Conservation of Habitats and Species (Amendment) Regulations, 2012</i> Section 9 of the <i>Wildlife and Countryside Act, 1981</i> (as amended) Section 41 of the <i>Natural Environment and Rural Communities (NERC) Act, 2006</i>	Yes
Palmate newt	Provision 5 of Section 9 of the <i>Wildlife and Countryside Act, 1981</i> (as amended)	No
Smooth newt	Provision 5 of Section 9 of the <i>Wildlife and Countryside Act, 1981</i> (as amended)	No

The Conservation of Habitats and Species Regulations, 2010

European protected species are listed on Schedule 2 of the *Conservation of Habitats and Species Regulations 2010*. Those species listed on Schedule 2 are protected under Regulation 41, which refers to the protection of wild animals of a European Protected Species. The following is a summary of the offences listed under Regulation 41, however, the *Conservation Regulations* should always be referred to for the exact and current wording:

Under Regulation 41 of the *Conservation of Habitats and Species Regulations, 2010* it is an offence to –

- deliberately capture or kill a wild animal of a European protected species;
- deliberately disturb wild animals, in particular any disturbance which is likely:
 - to impair their ability to survive, to breed or reproduce, or to rear or nurture their young; or
 - to impair their ability, in the case of animals of a hibernating or migratory species, to hibernate or migrate;
 - to affect significantly the local distribution or abundance of the species to which they belong
- deliberately take or destroy the eggs of such an animal; or
- damage or destroy a breeding site or resting place of such an animal.
- keep, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a European protected species, or any part of, or anything derived from, such an animal.

Wildlife and Countryside Act, 1981 (as amended)

British protected species of animal are listed on Schedule 5 of the *Wildlife and Countryside Act, 1981 (as amended)*. Those species listed on Schedule 5 are protected under Part 1, Section 9, which refers to the protection of certain wild animals. The following is a summary of the offences listed under Section 9; however the Act should always be referred to for the exact and current wording:

Under Section 9 of the *Wildlife and Countryside Act, 1981 (as amended)* if any person –

- intentionally kills, injures or takes any wild animal included in Schedule 5;
- has in his possession or control any live or dead wild animal included in Schedule 5 or any part of, or anything derived from such an animal;
- intentionally or recklessly damages or destroys, or obstructs access to, any structure or place which any wild animal included in Schedule 5 uses for shelter or protection;
- disturbs any such animal included in Schedule 5 while it is occupying a structure or place which it uses for that purpose;
- sells, offers or exposes for sale, or has in his possession or transports for the purpose of sale, any live or dead wild animal included in Schedule 5, or any part of, or anything derived from, such an animal; or,
- publishes or causes to be published any advertisement likely to be understood as conveying that he buys or sells, or intends to buy or sell, any of those things, he shall be guilty of an offence.

This legislation applies to all life stages of GCN. Heavy fines (up to £5,000 per incident) can be imposed for **each** offence, and a prison sentence of up to 6 months for each offence can be given to any person found guilty of an offence. In certain circumstances, any machine, tool or implement involved in an illegal act can also be seized.

Natural England (NE) issue licences for the disturbance of European Protected Species including GCN, certain criteria must be met before a licence can be issued to enable otherwise prohibited works to proceed. Such criteria may be subject to change without notice. For further information please visit www.naturalengland.org.uk

The Natural Environment and Rural Communities (NERC) Act, 2006 (as amended)

The following is a summary of the *Natural Environment and Rural Communities (NERC), Act, 2006 (as amended)*, the *NERC Act* itself should be referred to for the exact and current wording:

- Every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity;
- In complying with the above, a Minister of the Crown, government department or the National Assembly for Wales must in particular have regard to the United Nations Environmental Programme Convention on Biological Diversity of 1992;
- Conserving biodiversity includes, in relation to a living organism or type of habitat, restoring or enhancing a population or habitat.

Appendix C: GCN Appraisal/Survey Methods

GCN Survey Methods

Egg Search: All native newts lay their eggs singly on submerged leaves of water plants and other suitable submerged substrates. Careful examination of pond vegetation can therefore be used to establish the presence of newts in a pond during the breeding season. GCN eggs can be distinguished from those of smooth and palmate newts by their size and colour therefore enabling species-specific presence/absence to be determined. When GCN eggs have been identified (establishing that the pond is a breeding site) no further egg search effort should be undertaken at that pond, as additional disturbance could result in egg predation and/or reduce viability.

Torch Survey: Using 'Clulite' 1-million candlepower torches, this is a reliable method of establishing the presence/absence and counting the number of newts in ponds during the breeding season. Weather conditions can limit surveying, dry, still nights are required to allow effective observation as can the condition of the pond, i.e. deep, weedy or turbid ponds may require other survey methods to be employed.

Bottle Trapping: This method is useful where water is turbid or where vegetation restricts torch searching. It can help establish presence or absence and give an idea of population size. Ideally, traps are set at 2 metre intervals around the shallow margins of the pond during the early evening and collected the following morning; this method allows accurate identification of species, sex and life stage to be recorded. Where areas of the pond are inaccessible due to steep sides, deep water/silt or overhanging trees, etc., the bottle traps can sometimes be set in random transects, utilising the same number of traps as for the 2 metre intervals whenever possible (e.g. 15 traps for a 30m circumference pond). Bottle trapping should not be used in areas where there are health and safety concerns i.e. steep banks and deep water/silt or where there is a risk of vandalism or disturbance from animals.

Netting: This method can be useful in confirming GCN presence within a pond; however it should not be regarded as particularly reliable because adult GCN and their larvae may evade capture, especially in deep, large or thickly vegetated ponds.

eDNA Testing: GCN presence or likely absence can be reliably established at a water body between mid-April and the end of June using the eDNA analysis method; whereby samples of the surveyed water body are collected by the appointed ecologist and analysed by an approved agent for the presence of GCN DNA. All GCN eDNA sampling surveys should be undertaken by suitably trained, experienced and licensed ecologists in strict accordance with sampling protocol and the DEFRA published eDNA survey Technical Advice Note WC1067: Appendix 5 technical advice note for field & laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA, 2014.

Habitat Suitability Index: As part of all GCN surveys, a 'Habitat Suitability Index' (HSI) score should be calculated for each pond surveyed. The HSI score is a measure of GCN habitat suitability and can be used to help determine the likelihood of GCN presence within a pond. The HSI score is determined by assessing 10 factors, i.e. the likely presence of fish, water quality, etc. The results obtained are converted to a number and a calculation performed to give a figure between 0 and 1. This number can then be used to categorise GCN pond habitat with 0 representing unsuitable and 1 optimal habitat. However, the

system is not sufficiently precise to allow the conclusion that any particular pond with a high score will support newts, or that any pond with a low score will not.

NB: Where access permission to inspect a water body cannot be obtained and/or it is not possible to undertake appraisal/survey effort at the appropriate time of year (mid-March to mid-June) likely GCN presence or absence and the population size class associated with a site can generally be reliably predicted, by an experienced GCN ecologist, using historic records and/or the local status of the species combined with an assessment of the availability and suitability of aquatic and terrestrial habitats at and neighbouring the site.

As ponds frequently differ in terms of vegetative cover, water depth and clarity it is not always physically possible to utilise three or more survey methods at each individual pond. Constraining factors such as steep sides, deep water/silt, the risk of bottle traps being disturbed or damaged by livestock or the public, or torch survey being restricted by turbid or weedy ponds, determine which methods can be reliably and safely used.

Terrestrial Appraisal/Survey Methods

Terrestrial Refugia Hand Searches

Natural England recommends that terrestrial refugia searches for sheltering GCN/amphibians is only appropriate for distinct habitat features i.e. artificial refugia and/or 'natural' refugia that can be carefully lifted/dismantled by hand with minimal risk of harm to GCN/amphibians. Examples: include corrugated tin sheets, wooden boards/planks, plastic sheeting, fallen/old timbers, small rubble piles, topsoil mounds and areas of fractured hard-standing. Refugia searches should not be undertaken in winter when GCN/amphibians are inactive or in extremely hot periods in summer. Searches should only be carried out in suitable weather conditions as per the *Great crested newt mitigation guidelines*.

Terrestrial night torch searches

Natural England recommends that terrestrial torch searches for foraging and/or migrating GCN/amphibians should be carried out by highly experienced amphibian ecologist/s using high power torches (at least 1 Million candle power). The searches should be undertaken on relatively mild nights during rain or shortly after rain when GCN/amphibian prey species such as earthworms and slugs are active above ground. All searches should ideally start around 22.00 (even if dark earlier) and should last for approximately 3 hours (more on very large sites). The effort should involve repeat scanning of all areas to check for GCN/amphibians emerging from the ground with checks made at ground level along linear features such as fence lines and/or the exterior walls buildings (first and last checks). Walk slowly scanning torch in front; check refuges. Cease search if much leaf fall as this makes GCN/amphibians difficult to detect. Take great care to avoid stepping on GCN/amphibians.

Appendix D: Photographic Plates



Plate 1: View of the proposed development site looking east (to Main Road)



Plate 2: View of the proposed development site looking north



Plate 3: View of the proposed development site looking south



Plate 4: Pond 1 a GCN breeding site located to the south east of the proposed development site

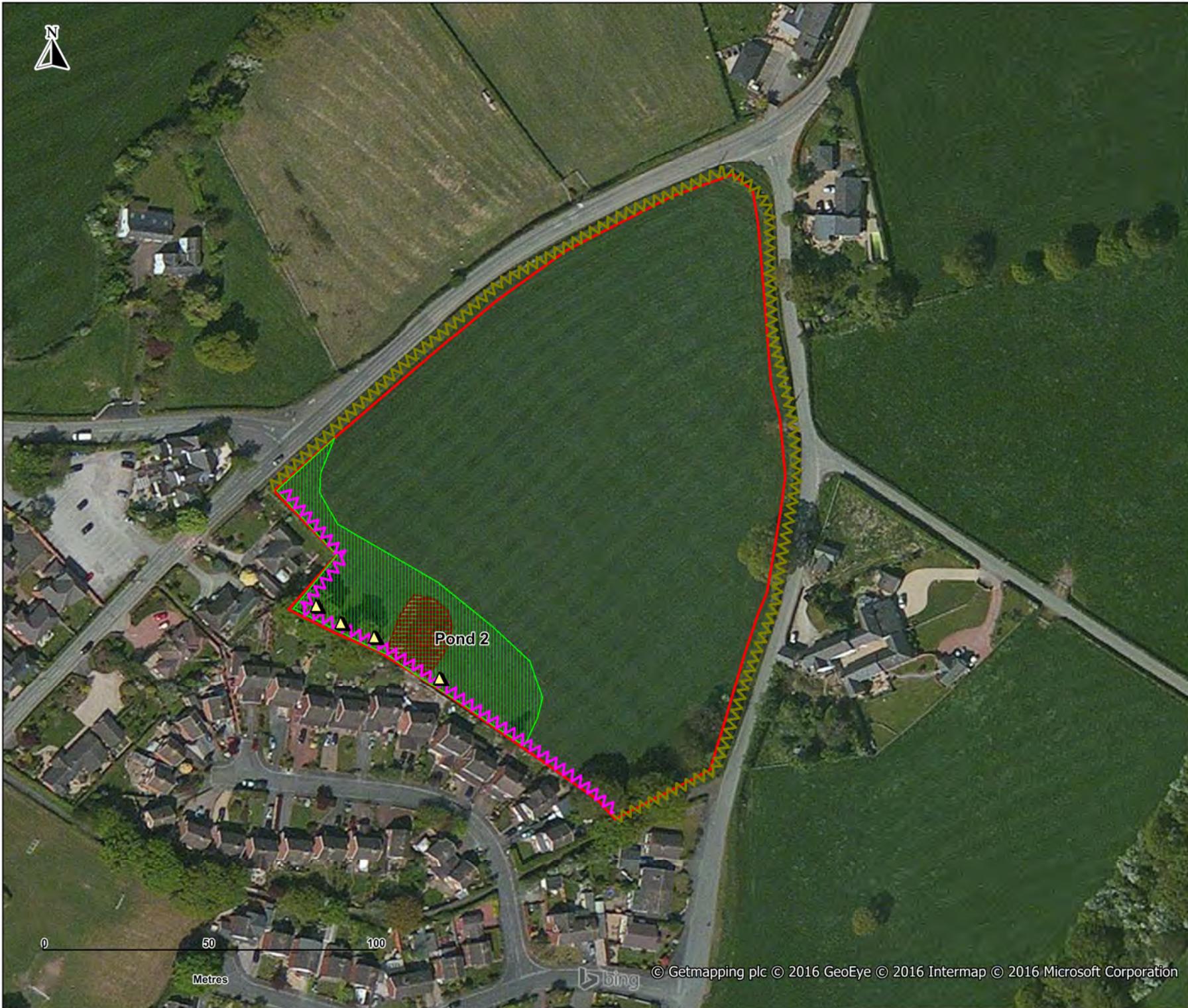


Plate 5: Pond 2 a GCN breeding site located within the proposed development site

Appendix E: Terrestrial Habitat Suitability Index (THSI)

GCN Habitat Type	Example Habitats	Suitability for GCN
No shelter/hibernation sites No foraging habitat No habitat connectivity Complete barrier to GCN dispersal	Extensive areas of intact hard standing Compacted sports field Built environs Industrial/commercial sites	Very Poor
No shelter/hibernation sites Limited foraging habitat No/restricted habitat connectivity Significant restrictions/barriers to GCN dispersal	Compacted hard-standing Intensively managed farmland Closely mown amenity grassland School playing field Industrial/commercial sites	Poor
Limited availability of shelter sites No obvious hibernation sites Some foraging habitat Restricted habitat connectivity Restrictions/barriers to GCN dispersal	Managed arable farmland High density grazing Intensively managed grassland Areas of formal planting Industrial/commercial sites	Below average
Some shelter and hibernation sites Some foraging habitat Some habitat connectivity Some restrictions/barriers to GCN dispersal	Managed semi-improved grassland Grazed pasture Infrequently mown grassland Hedgerows narrow buffer zone Brownfield sites abandoned <5yrs Gardens	Average
Shelter and hibernation sites Varied foraging habitat Habitats linked/connected Few barriers to GCN dispersal	Unimproved grassland Unmanaged semi-improved grassland Mature hedgerows wide buffer zone Low density grazing Established gardens Brownfield site abandoned >5yrs	Above average
Range shelter & hibernation sites Varied and diverse foraging habitat Habitats connected Few/no restrictions/barriers to GCN dispersal	Rough/tussocky grassland Areas of scrub New woodland Organically managed farmland Railway embankments Mature gardens Allotments Mineral workings	Good
Widespread shelter and hibernation sites Extensive varied and diverse foraging habitat Habitat extensive and well connected No restrictions/barriers to GCN dispersal	Mature deciduous woodland Managed wildlife areas/reserves Old mineral workings	Excellent

Appendix F(i): Habitat Compensation Plan



Legend
(Indicative Locations)

- Proposed development site boundary
-  Pond 2 to be retained and enhanced
-  Indicative Wildlife / POS area to be planted with native species of local provenance (0.28ha.).
-  Retained hedgerow (approx. 430m)
-  New native species hedgerow (approx. 170m)
-  GCN Hibernacula (4 no.)

Client:	Renew Land Developments Ltd	
Project:	Site off Main Road, Higher Kinnerton	
Map:	GCN Habitat Compensation Plan	
CES Ref:	CES/1214//PS	
Scale:	Not to scale	
Date/Rev:	June 2016	0

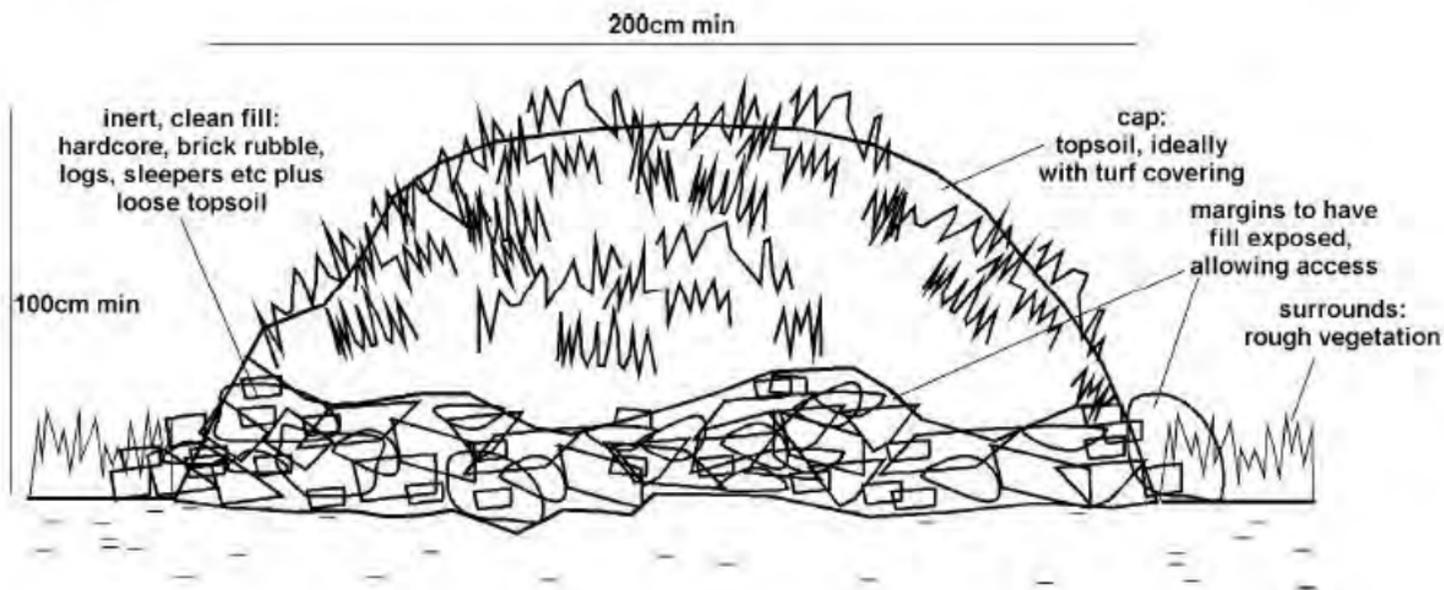
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Malpas
Cheshire
SY14 8EF



Appendix F(ii): Amphibian Hibernacula Design

Figure 3: Suggested hibernaculum design

This design mimics artificial and natural conditions in which great crested newts have frequently been found overwintering. Dimensions should not be below 2m length x 1m width x 1m height. The illustrated design would be suitable for locating on an impermeable substrate. On free-draining substrates, the design is largely similar but the bulk of the fill is sited in an excavated depression in the ground. Hibernacula should ideally be positioned across a site, both close to and distant from breeding ponds, always in suitable terrestrial habitat and above the flood-line.





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info@ces-ecology.co.uk



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consultant ecologists

Bickley Hall Farm
Bickley, Malpas
Cheshire SY14 8EF

Tel: 01948 820229

Email: info@ces-ecology.co.uk
Web: ces-ecology.co.uk

Annex K2:
SureScreen Scientifics Technical Report

Folio No: E3314
Report No: 1
Order No: 18050
Client: ECOLOGY SERVICES LTD
Contact: Charlotte Wood
Contact Details: charlotte.wood@ecologyservices.co.uk
Date: 19/06/2018

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS

Date sample received at Laboratory: 14/06/2018
Date Reported: 19/06/2018
Matters Affecting Results: None

RESULTS

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
3023	Gorse Hill	SD 399 081	Pass	Pass	Pass	Negative	0
3024	Higher Kinnerton	SJ 332 615	Pass	Pass	Pass	Negative	0

SUMMARY

When Great Crested Newts (GCN); *Triturus cristatus* inhabit a pond, they deposit traces of their DNA in the water as evidence of their presence. By sampling the water, we can analyse these small environmental DNA (eDNA) traces to confirm GCN habitation, or establish GCN absence.

The water samples detailed below were submitted for eDNA analysis to the protocol stated in DEFRA WC1067 (Latest Amendments). Details on the sample submission form were used as the unique sample identity.

Forensic Scientists and Consultant Engineers
SureScreen Scientifics Division Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientific@surescreen.com
Company Registration No. 08950940

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RESULTS INTERPRETATION

Lab Sample No.- When a kit is made it is given a unique sample number. When the pond samples have been taken and the kit has been received back in to the laboratory, this sample number is tracked throughout the laboratory.

Site Name- Information on the pond.

O/S Reference - Location/co-ordinates of pond.

SIC- Sample Integrity Check. Refers to quality of packaging, absence of tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to results errors. Inspection upon receipt of sample at the laboratory. To check if the Sample is of adequate integrity when received. Pass or Fail.

DC- Degradation Check. Analysis of the spiked DNA marker to see if there has been degradation of the kit since made in the laboratory to sampling to analysis. Pass or Fail.

IC- Inhibition Check- PCR inhibitors can cause false results. Inhibitors are analysed to check the quality of the result. Every effort is made to clean the sample pre-analysis however some inhibitors cannot be extracted. An unacceptable inhibition check will cause an indeterminate sample and must be sampled again.

Result- NEGATIVE means that GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as no evidence of GCN presence. POSITIVE means that GCN eDNA was found at or above the threshold level and the presence of GCN at this location at the time of sampling or in the recent past is confirmed. Positive or Negative.

Positive Replicates- To generate the results all of the tubes from each pond are combined to produce one eDNA extract. Then twelve separate analyses are undertaken. If one or more of these analyses are positive the pond is declared positive for the presence of GCN. It may be assumed that small fractions of positive analyses suggest low level presence but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive.

METHODOLOGY

The laboratory testing adheres to strict guidelines laid down in WC1067 Analytical and Methodological Development for Improved Surveillance of The Great Crested Newt, Version 1.1

The analysis is conducted in two phases. The sample first goes through an extraction process where all six tubes are pooled together to acquire as much eDNA as possible. The pooled sample is then tested via real time PCR (also called q-PCR). This process amplifies select part of DNA allowing it to be detected and measured in 'real time' as the analytical process develops. qPCR combines PCR amplification and detection into a single step. This eliminates the need to detect products using gel electrophoresis. With qPCR, fluorescent dyes specific to the target sequence are used to label PCR products during thermal cycling. The accumulation of fluorescent signals during the exponential phase of the reaction is measured for fast and objective data analysis. The point at which amplification begins (the Ct value) is an indicator of the quality of the sample. True positive controls, negatives and blanks as well as spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared so they act as additional quality control measures.

The primers used in this process are specific to a part of mitochondrial DNA only found in GCN ensuring no DNA from other species present in the water is amplified. The unique sequence appropriate for GCN analysis is quoted in DEFRA WC 1067 and means there should be no detection of closely related species. We have tested our system exhaustively to ensure this is the case in our laboratory. We can offer eDNA analysis for most other species including other newts.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. Kits are manufactured by SureScreen

Scientifics to strict quality procedures in a separate building and with separate staff, adopting best practice from WC1067 and WC1067 Appendix 5. Kits contain a 'spiked' DNA marker used as a quality control tracer (SureScreen patent pending) to ensure any DNA contained in the sampled water has not deteriorated in transit. Stages of the DNA analysis are also conducted in different buildings at our premises for added

SureScreen Scientifics Ltd also participate in Natural England's proficiency testing scheme and we also carry out inter-laboratory checks on accuracy of results as part of our quality procedures.

Reported by: Sam Humphrey

Approved by: Derry Hickman

End Of Report
