Survey and Assessment for Great Crested Newt (*Triturus cristatus*) and other Amphibian Species

Rockingham

Harworth Estates

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Report Reference & History: Document 1, version 1			
	Name	**Signature**	**Date**
Originators	J Pounder		May – June 2014
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Approved By	AES - LTD		June 2014

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1.0 INTRODUCTION

1.1 Applied Ecological Services Ltd. was commissioned to undertake a further great crested newt (*Triturus Cristatus*) survey in ponds located on the Rockingham site following the results of a late season survey undertaken in 2013. The purpose of the survey was to establish the presence or absence of great crested newt (GCN) within ponds deemed suitable for supporting such species in the extended survey area.

1.2 GCN and their breeding sites or resting places are protected under Regulation 41 of the Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981. It is an offence for anyone to intentionally kill, injure or disturb a GCN to possess one (whether live or dead), or to sell or offer one for sale without a licence. It is also an offence to damage, destroy or obstruct access to any place used by great crested newt for shelter. The species is protected in all life phases: egg, larvae and adult.[1]

SITE SETTING AND BACKGROUND TO THE DEVELOPMENT (A BRIEF SUMMARY)

1.4 The Rockingham site located 0.5 kilometres west of the village of Hoyland, near Barnsley and is identified as an area for future employment use / development. The site is strategically placed with the M1 motorway just 0.5 kilometres to the east of the site and the A6195 forms the southern boundary to the site. The extended survey area was located at grid reference SE 351 009 (approximate central point). The site is mainly located on restored former mining land which is bordered by a mix of broadleaved woodland, ponds, watercourse, rough grassland and hedgerows.

PRE-EXISTING INFORMATION ON GREAT CRESTED NEWTS AT THE SURVEY SITE

1.3 Previous surveys undertaken within the study area recorded great crested newt larvae (AES-LTD 2013). Common amphibian species have been recorded, smooth newt (*Triturus vulgaris)*, common toad *(Bufo bufo)* and common frog *(Rana temporaria)*. Great crested newts are reported at a pond about 1 mile south of Pond 4 (reported by a member of the public May 2014 during survey).

[1] Regulation 41 of the Conservation of Habitats and Species Regulations 2010 and Section 9 of the Wildlife and Countryside Act 1981.

STATUS OF GREAT CRESTED NEWTS IN THE LOCAL / REGIONAL AREA

1.4 On a regional basis great crested newts have a scattered distribution in Yorkshire their full status and distribution within the county is unknown. There are no records for great crested newt in the immediate area around the site but this species is recorded within 2Km of the site.

OBJECTIVES OF SURVEY

1.5 The objectives of the surveys undertaken in 2014 were to:

- Determine the presence of and identify amphibian species in ponds located in the extended survey area; and
- To undertake a population size class assessment if the presence of great crested newts was confirmed in those ponds in the extended survey area.

SURVEY AREA

1.6 The extended survey area was all land shown coloured in green and yellow on Figure 1, the proposed development site was located at grid reference (SE 350 008, approximate central point). No ponds were located within the proposed development site at the time of the survey. AES - LTD identified five standing water bodies within the wider Rockingham Site in 2013; these were:

- Pond 1 – A large pond off Hay Green Lane which acts as a retaining pond during periods of heavy rain
- Pond 2 – A small pond linked to Pond 1 through a culvert as part of a SUDS system. Pond 2 demonstrated a great difference in water levels.
- Pond 3 – A large established pond on the north side of the A6195
- Pond 4 – A large established pond on the south side of the A6195
- Pond 5 – A large well established pond next to Shortwood Business Park
- Several smaller ephemeral ponds where identified during the habitat mapping, but considered unsuitable to great crested newt and so were not surveyed.

1.7 The five ponds highlighted in Figure 1 have been surveyed for GCN and other amphibians. See Figure 1 for pond locations.

POND DESCRIPTIONS

1.8 ***Pond 1***: Located at: SE352 014; a pond which measures 51m x 12m. Maximum depth is over 1 metre. The water depth is subject to a great increase during periods of flooding. The pond is well vegetated on all sides away from the culvert but vegetation cover was sparse within the discharge zone.

1.9 ***Pond 2***: Located at: SE352 013; a small pond linked to Pond 1 via a drainage channel and culvert, measuring 10m x 10m. The levels and depth of this pond vary greatly and during the surveys had a depth of under 50cm to over 1m. A small island is exposed during low water levels with some areas of Common reed (*Phragmites australis*) but very little other pond vegetation.

1.10 ***Pond 3***: Located at SE 352 010 is a large well established pond close to the A6195, measuring 40m x 14m. The ponds depth is over 1 metre and has well established reedmace (*Typha latifolia)* and Common reed beds on each side of the pond.

1.11 ***Pond 4***: Located at SE353 010 is a large established pond separated from the other ponds by the A6195 accessed through an underpass; measuring 50m x 12m. The pond is well established with both reedmace and *Phragmites* reed beds.

1.12 ***Pond 5***: Located at SE356 015 is an established pond located at the Shortwood Business Park to the north east of the other ponds. It is a V shaped balancing pond approximately 13m x 76m which is over vegetated with reedmace.

2.0 METHODS

2.1 The surveys undertaken during 2014 were for all amphibian species. Field surveys were undertaken between 25th April and the 17th May 2014. Due to its protected status the survey methodology detailed below concentrates on great crested newt. Other amphibian species including common toad, common frog, smooth newt and palmate newt have limited legal protection, but these species were surveyed for as they add to the biological diversity of a site.

HABITAT SUITABILTY INDICES

2.2 A Habitat suitability index was calculated for Ponds 1, 2, 3, 4 and 5 as a part of the Phase 1 Habitat Survey and they were repeated prior to the commencement of this survey. The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham *et al*. (2000)[2]. HSI scoring systems were originally developed by the US Fish and Wildlife Service as a means of evaluating habitat quality and quantity. An HSI is a numerical index, between 0 and 1. 0 indicates unsuitable habitat, 1 represents optimal habitat. The HSI for the great crested newt incorporates ten suitability indices, all of which are factors thought to affect great crested newts. The resulting score can be used to categorise Pond suitability for great crested newts as shown below:

TABLE 1: HABITAT SUITABILITY INDEX

HSI score	Categorisation of HSI scores
<0.5	poor
0.5 – 0.59	below average
0.6 – 0.69	average
0.7 – 0.79	good
> 0.8	excellent

2.3 The HSI for great crested newts is a measure of habitat suitability. In general, ponds with high HSI scores are more likely to support great crested newts than those with low scores. 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 do so.

[2] Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10 (4), 143-155.

2.4 In addition to HSI a risk assessment was undertaken using criteria developed by Natural England to determine if an offence was likely to be committed in the event that great crested newt were present in and / or near the site.

GREAT CRESTED NEWT SURVEYS

2.5 Ponds 1 – 5 were surveyed for GCN and all other amphibian species during the survey period. Standard methodology for surveying for GCN as described in English Nature's *Great crested newt mitigation guidelines* (2001)[3] were followed and are summarised below. Surveys were undertaken in two stages, daytime surveys and evening / night time surveys. Ambient temperatures were recorded from a standard thermometer.

2.6 **Daytime surveys**: involved the visual and physical examination of ponds and adjacent habitat for the presence of suitable spawning areas, egg-laying plants, tadpoles, juveniles, sub-adults and adult amphibians of all species. Broad – leaved plants that had the potential to have GCN eggs attached to them i.e. *potential egg-laying plants* were closely inspected for the presence of amphibian eggs. In addition to this, hand searches were made of other suitable areas situated in the survey area that may have been providing temporary refugia for terrestrial based amphibians; Including potential natural refugia During the hand searching periods, stones, boulders, vegetation, and other materials such as occasional litter were visually inspected on their undersides for the presence of amphibian species. Ambient temperatures were recorded from a standard thermometer as detailed below.

2.7 **Evening surveys**: involved undertaking torchlight surveys at each survey location. The surveyor slowly walked around the water body shining a powerful (one million candle power) lamp through the water surface in a sweeping (side to side) motion. Using this torchlight survey method, amphibians are usually detected in the light beam. This method usually allows sufficient time for the species and often the sex of the individual to be identified. Netting was undertaken for a minimum of 15 minutes per 20 metres of shoreline. Bottle traps were installed in Ponds 1 to 5 on the evening of each survey day. Bottle trapping involved setting bottle traps (made from clear 2-litre plastic bottles) around each of the pond margins. Traps were laid at a density of one trap every two metres of accessible shoreline. Traps were set at

[3] English Nature (2001). *Great Crested Newt Mitigation Guidelines*. English Nature, Peterborough.

dusk and were left set overnight. Traps were checked and removed before 0800 hours the following morning.

TIMING

2.8 Surveys were undertaken on the 25/26th April, 1st/2nd May, 10/11thth May, 17/18th May 2014 and the 9th/10th June 2014.

WEATHER CONDITIONS

2.9 Throughout the survey period ambient temperatures were recorded on each survey day.

TABLE 2: WEATHER CONDITIONS DURING THE SURVEY PERIOD

Date	Temperature	Weather conditions
25/26th April 2014	9.5	Dry / light breeze
1st/2nd May 2014	10	Heavy showers/ breeze
10th/11thth May 2014	12	Showers/ gentle breeze
17th/18th May 2014	14	Dry/ light breeze
9th/10th June 2014	17	Dry / light breeze

PERSONNEL

2.10 All survey work was undertaken by Jonathan Pounder (licensed amphibian worker) assisted by Andrew Pounder and Scott Tullock, B.Sc. Hons assistant ecologists and supervised by Gary Tudor (Licensed amphibian surveyor).

3.0 RESULTS

3.1 Table 3: below gives the results of the HSI assessment for each pond.

TABLE 3: HSI SCORES

Pond reference	1	2	3	4	5
SI1 – Location	1	1	1	1	1
S12 – Pond area	1	0.1	0.9	1	0.9
SI3 – Pond Drying	1	0.5	0.9	0.9	0.9
SI4 – Water Quality	1	0.33	1	1	1
SI5 – Shade	1	1	1	1	1
SI6 – Fowl	0.67	1	0.67	0.67	0.67
SI7 - Fish	0.33	1	0.33	0.33	0.33
SI8 – Ponds	0.95	0.95	0.95	0.32	0.95
SI9 – Terrestrial Habitats	1	1	1	1	0.67
SI10 - Macrophytes	0.9	0.5	0.9	0.9	0.9
HSI	**0.83**	**0.62**	**0.83**	**0.75**	**0.80**

3.2 The table below gives the summary Presence / Absence results for the survey.

TABLE 4: PRESENCE / ABSENCE OF AMPHIBIAN SPECIES IN PONDS

Pond number	Presence / absence				
	Great crested newt	Smooth newt	Palmate newt	Frog	Toad
1	0	✓	0	✓	✓
2	0	0	0	0	0
3	✓	✓	0	✓	✓
4	0	✓	0	✓	✓
5	0	✓	0	✓	✓

✓* Species present; 0* Species unrecorded

3.3 **Pond 1** – Good numbers of smooth newt recorded within the vegetated areas of the pond, but not recorded in the clear area by the culvert. Water Scorpion, Dragon Fly nymph and Greater Diving Beetle were also found. Red coloured Ramshorn Snails also found.

3.4 **Pond 2** – No species recorded in this pond, Smooth newts where recorded in the connecting ditch between Pond 1 and 2 during the 1st and 3rd visits, but this channel had dried out by survey 4.

3.5 **Pond 3** – A single great crested newt was seen during torchlight survey during the second survey. Good numbers of smooth newt found on every survey as well as Dragon Fly nymph and Greater Diving Beetle.

3.6 **Pond 4** - Good numbers of smooth newt found on every survey as well as Dragon Fly nymph and Greater Diving Beetle.

3.7 **Pond 5** - Good numbers of smooth newt were found during the first 3 surveys, but none found on the 4th visit. Dragon Fly nymph also found.

3.8 Common frog tadpoles, common toad tadpoles and Common toad were recorded in all ponds except Pond 2.

3.9 The results of the Natural England risk assessment shows the likelihood of an offence being committed if the development were to proceed without a development licence.

TABLE 5: RISK ASSESSMENT BASED ON THE SURVEY FINDINGS

Component	Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom)	Notional offence probability score
Great crested newt breeding pond(s)	No effect	0
Land within 100m of any breeding pond(s)	No effect	0
Land 100-250m from any breeding pond(s)	No effect	0
Land >250m from any breeding pond(s)	No effect	0
Individual great crested newts	No effect	0
	Maximum:	0
Rapid risk assessment result:	**GREEN: OFFENCE HIGHLY UNLIKELY**	

4.0 DISCUSSION

TABLE 5: HABITAT SUITABILITY FOR GCN IN PONDS SHOWN LOCATED IN THE SURVEY AREA

Pond number	HSI Rating
1	Excellent
2	Average
3	Excellent
4	Good
5	Excellent

PRESENCE / ABSENCE OF ALL AMPHIBIAN SPECIES

4.1 One GCN was recorded in Pond 3 during the survey period. Smooth newts where recorded in all ponds; with Common toad and common frog recorded in all ponds except Pond 2.

SITE STATUS ASSESSMENT

4.2 Three ponds offered Excellent potential to great crested newt, one was scored as Good and Pond 2 was scored as Average, terrestrial habitat also offered good opportunities for amphibian species in the more undisturbed areas peripheral to the site. The flooding nature of Pond 2 restricts its suitability for amphibian species with the isolation of Pond 5 within the business park also restricting its potential for amphibian species.

4.3 A single individual great crested newt was recorded in Pond 3. Other common amphibian species were present in ponds elsewhere in the extended survey area. The population of great crested newt present in the extended survey area was classed as Small in accordance with guidance given by Natural England. Works proposed within the development area will not require a Natural England Development Licence to proceed as it is highly unlikely that an offence will be committed. It is strongly recommended that the development proceeds on a detailed risk assessment basis, to be drafted, given the presence of great crested newt in areas peripheral to the site.

4.4 The potential development areas within the Rockingham Site offer only very limited habitat potential to GCN and other amphibian species due to the absence of suitable aquatic and terrestrial habitats. Mitigation will be required for each stage of the developments to proceed, but it is anticipated that the levels of disturbance to the areas supporting GCN and other amphibian species will be so low that the majority of construction works could proceed on a risk assessment basis. However, it needs to be made clear here that each development phase will need to be assessed individually and on its own merits in terms of impacts on any species.

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Hay Green
House
HAY GREEN LANE
Track
Track
Track
Path
Shortwood Business Park
SHORTWOOD WAY
STOCKWITH LANE
SHORTWOOD COURT
SP(5)
Drain
Drain
Path
Path
Pp Ho
D1
D2
D3
D4
R1
R2
R3
R4
1
2
3
4
5
6
7
8
9
10
11
Key
Pond
1 Pond 1
2 Pond 2
3 Pond 3
4 Pond 4
SP(5) Shortwood Pond
9 Shallow waterbodies / pools
SITE
Rockingham
Figure 1: Pond Location plan
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APPENDIX A

Amphibian Species Record Sheet (raw data) **Pond: 1**

Date	Temp (ºC)	Weather conditions	Methods (Tick methods used)						Species captured / observed & number (Indicate sex / life stage)				
			Hand search	Egg search	Torch	Net	Bottle trap	Pitfall trap	Great crested newt	Smooth newt	Palmate newt	Frog	Toad
25/26th April 2014	9.5 ^{0}C	Dry / light breeze	✓	✓	✓	✓	✓ 30		0	Total: 9 Torch = 2x SN M, 1x SN F Bottle = 2x SN M, 4x SN F	0	Tadpoles	Tadpoles
1st/2nd May 2014	10 ^{0}C	Heavy showers/ breeze	✓	✓	✓	✓	✓ 30		0	Total: 14 Bottle = 6x SN M, 8x SN F	0	Tadpoles	Tadpoles 1 Ad
10/11th May 2014	12 ^{0}C	Showers/ gentle breeze	✓	✓	✓	✓	✓ 30		0	Total: 19 Torch = 3x SN M Bottle = 7x SN M, 9x SN F	0	Tadpoles	Tadpoles
17/18th May 2014	14 ^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 30		0	Total: 10 Torch = 1x SN M, 3x SN F Bottle = 2x SN M, 4x SN F	0	Tadpoles 1 Ad	Tadpoles
9th / 10th June 2014	17^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 30		0	Torch = 3 SN M	0	Tadpoles	0

Key: A = adult; j = juvenile; m = male; f = female; 0 = not recorded

Amphibian Species Record Sheet (raw data) **Pond: 2**

Date	Temp (ºC)	Weather conditions	Methods (Tick methods used)						Species captured / observed & number (Indicate sex / life stage)				
			Hand search	Egg search	Torch	Net	Bottle trap	Pitfall trap	Great crested newt	Smooth newt	Palmate newt	Frog	Toad
25/26th April 2014	9.5 ^{0}C	Dry / light breeze	✓	✓	✓	✓	✓ 10		0	Total: 6 Torch = 3x SN M, 3x SN F	0	0	0
1st/2nd May 2014	10 ^{0}C	Heavy showers/ breeze	✓	✓	✓	✓	✓ 10		0	0	0	0	0
10/11thth May 2014	12 ^{0}C	Showers/ gentle breeze	✓	✓	✓	✓	✓ 10		0	Total: 2 Torch = 1x SN M, 1x SN F	0	0	0
17/18th May 2014	14 ^{0}C	Dry/ light breeze	✓	✓	✓	✓	0		0	0	0	0	0
9th / 10th June 2014	17^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 0		0	0	0	0	0

Key: A = adult; j = juvenile; m = male; f = female; 0 = not recorded

Amphibian Species Record Sheet (raw data) **Pond: 3**

Date	Temp (ºC)	Weather conditions	Methods (Tick methods used)						Species captured / observed & number (Indicate sex / life stage)				
			Hand search	Egg search	Torch	Net	Bottle trap	Pitfall trap	Great crested newt	Smooth newt	Palmate newt	Frog	Toad
25/26th April 2014	9.5 ^{0}C	Dry / light breeze	✓	✓	✓	✓	✓ 35		0	Total: 15 Torch = 1x SN M, 5x SN F Bottle = 4x SN M, 5x SN F	0	Tadpoles	Tadpoles 2x Ad
1st/2nd May 2014	10 ^{0}C	Heavy showers/ breeze	✓	✓	✓	✓	✓ 35		Torch: 1	Total: 12 Torch = 3x SN M, 5x SN F Bottle = 2x SN M, 2x SN F	0	Tadpoles	Tadpoles
10/11th May 2014	12 ^{0}C	Showers/ gentle breeze	✓	✓	✓	✓	✓ 35		0	Total: 20 Torch = 5x SN M, 6x SN F Bottle = 4x SN M, 5x SN F	0	Tadpoles	Tadpoles
17/18th May 2014	14 ^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 35		0	Total: 19 Torch = 7x SN M, 8x SN F Bottle = 2x SN M, 2x SN F	0	Tadpoles	Tadpoles
9th / 10th June 2014	17^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 35		0	0	0	Tadpoles	Tadpoles

Key: A = adult; j = juvenile; m = male; f = female; 0 = not recorded

Amphibian Species Record Sheet (raw data) **Pond: 4**

Date	Temp (ºC)	Weather conditions	Methods (Tick methods used)						Species captured / observed & number (Indicate sex / life stage)				
			Hand search	Egg search	Torch	Net	Bottle trap	Pitfall trap	Great crested newt	Smooth newt	Palmate newt	Frog	Toad
25/26th April 2014	9.5 ^{0}C	Dry / light breeze	✓	✓	✓	✓	✓ 30		0	Total: 10 Torch = 2x SN M, 2x SN F Bottle = 1x SN M, 3x SN F	0	Tadpoles	Tadpoles
1st/2nd May 2014	10 ^{0}C	Heavy showers/ breeze	✓	✓	✓	✓	✓ 30		0	Total: 10 Torch = 5x SN M, 1x SN F Bottle = 2x SN M, 2x SN F	0	Tadpoles	Tadpoles
10/11th th May 2014	12 ^{0}C	Showers/ gentle breeze	✓	✓	✓	✓	✓ 30		0	Total: 18 Torch = 3x SN M, 6x SN F Bottle = 8x SN M, 1x SN F	0	Tadpoles	Tadpoles
17/18th May 2014	14 ^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 30		0	Total: 6 Torch = 4x SN M, 2x SN F	0	Tadpoles	Tadpoles
9th / 10th June 2014	17^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 30		0	0	0	Tadpoles	Tadpoles

Key: A = adult; j = juvenile; m = male; f = female; 0 = not recorded

Amphibian Species Record Sheet (raw data) **Pond: 5**

Date	Temp (ºC)	Weather conditions	Methods (Tick methods used)						Species captured / observed & number (Indicate sex / life stage)				
			Hand search	Egg search	Torch	Net	Bottle trap	Pitfall trap	Great crested newt	Smooth newt	Palmate newt	Frog	Toad
25/26th April 2014	9.5 ^{0}C	Dry / light breeze	✓	✓	✓	✓	✓ 30		0	Total: 3 Bottle = 2x SN M, 1x SN F	0	Tadpoles	Tadpoles
1st/2nd May 2014	10 ^{0}C	Heavy showers/ breeze	✓	✓	✓	✓	✓ 30		0	Total: 2 Torch = 1x SN F Bottle = 1x SN F	0	Tadpoles	Tadpoles
10/11thth May 2014	12 ^{0}C	Showers/ gentle breeze	✓	✓	✓	✓	✓ 30		0	Total: 15 Torch = 4x SN M, 5x SN F Bottle = 3x SN M, 3x SN F	0	Tadpoles	Tadpoles
17/18th May 2014	14 ^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 30		0	0	0	Tadpoles	Tadpoles
9th/10th June 2014	17^{0}C	Dry/ light breeze	✓	✓	✓	✓	✓ 30		0	0	0	Tadpoles	0

Key: A = adult; j = juvenile; m = male; f = female; 0 = not recorded