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J C BAMFORD EXCAVATORS LTD

HAREWOOD ESTATE, CHEADLE

GREAT CRESTED NEWT SURVEY REPORT

JUNE 2016

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J C BAMFORD EXCAVATORS LTD

HAREWOOD ESTATE, CHEADLE

GREAT CRESTED NEWT SURVEY REPORT

JUNE 2017

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1 INTRODUCTION

1.1 Background

Wardell Armstrong LLP (WA) was commissioned by J C Bamford Excavators Ltd to undertake great crested newt (GCN) *Triturus cristatus* surveys at the Harewood Estate, Cheadle, central Ordnance Survey (OS) grid reference SJ 99994 44220.

1.1.1 The surveys were carried out in order to determine the presence/absence of GCN on site and whether the findings are likely to pose a constraint to any development proposals, and provide an outline of any ecological mitigation which may be required to ensure that amphibians are fully considered within the development proposals.

1.1.2 Surveys followed Preliminary Ecological Assessment and Habitat Suitability Index (HSI) surveys carried out in April and May 2017 which recommended undertaking presence/absence surveys for seven waterbodies within a 500m radius of the site boundary.

1.1.3 The site of approximately 38 hectares is bounded by species-poor defunct and intact hedgerows and fence lines with the A522 adjacent to the eastern boundary. The town of Cheadle lies beyond the southern site boundary with open arable and pastoral farmland dominating the wider landscape. Hales Hall Pool Local Nature Reserve (LNR) and Cecilly Brook LNR lie 1.1km and 1.2km from the south eastern boundary of the site.

1.1.4 The area of detailed ecological study referred to as the site is comprised of a number of habitats, as follows: species-poor native hedgerows (both intact and defunct), improved grassland, semi-improved grassland, semi-improved calcareous grassland and marshy grassland. In addition, there is broad-leaved plantation woodland, scattered scrub, tall ruderal vegetation, ponds, streams, and ditches. Central to the site is a large industrial complex and associated buildings and areas of hardstanding and bare ground.

1.2 Legislative Framework

1.2.1 The great crested newt is protected by both British and EU legislations. In conjunction, the laws provide both the species and its habitats with strict protection. The Wildlife and Countryside Act 1981 (WCA 1981) provides protection to the species in Britain under Section 9, Schedule 5 of the Act.

1.2.2 The EU Habitats Directive (Council Directive 92/43/EEC (a) on the conservation on Natural Habitats and Wild Fauna and Flora) allows for the designation of Special Areas

for Conservation (SACs) for GCN. The species is listed in both Annex II and IV of the Habitats Directive, offering strict protection.

1.2.3 The Habitats Directive is implemented in Britain by the Conservation Regulations 1994 (or the Habitats Regulations) with protection provided via Regulation 39, Schedule 2. Furthermore, the Countryside and Rights of Way Act 2000 (CROW Act) allows for further amendments to the protection measures ensured by the WCA 1981.

1.2.4 The combined pieces of legislation make it illegal in the UK to:

- Intentionally/deliberately injure, capture or kill a great crested newt.
- Intentionally/deliberately disturb a great crested newt or disturb them in a place used for protection or shelter.
- Damage or destroy a great crested newt resting place or breeding site.
- Intentionally or recklessly damage, obstruct or destroy access to an area used for protection or shelter.
- Possess a great crested newt, either whole or part of, unless acquired lawfully
- Exchange, sell, barter, offer for sale or transport a great crested newt or parts of one.

2 SURVEY METHODOLOGY

2.1 Desk Study

2.1.1 A desk study was undertaken to determine records of GCN within at least 500m radius of the site boundaries (2 km from the central grid reference). This involved contacting Staffordshire Ecological Record (SER) for historical records of this species.

2.2 Field Survey Results

Habitat Suitability Index Assessment

2.2.1 All ponds were subject to an assessment of their suitability to support GCN by way of the GCN Habitat Suitability Index (HSI) (Oldham *et al*., 2000). The HSI assessment is a rapid survey technique used to assist professionals in assessing the suitability of ponds for breeding GCN. The assessment followed *Advice Note 5* (Amphibian and Reptile Groups of the United Kingdom, 2010).

2.2.2 The HSI is a numerical index between 0 and 1, wherein a score of 1 represents optimal habitat for GCN, shown in Table 1. It is calculated by assigning a quantitative figure to each of ten variables known to influence the presence of GCN (Oldham et al. 2000). The tenth root of the product of these variables is then calculated, giving a figure for habitat suitability. Since January 2008 it has been a requirement to include the results of HSI assessments in European Protected Species (EPS) Licence applications.

2.2.3 The variables to which a quantitative figure is assigned are:

- Location;
- Pond area;
- Pond drying;
- Water quality;
- Shade;
- Wildfowl presence;
- Fish presence;
- No. of ponds within 1km;
- Quality of terrestrial habitat;
- and Presence of macrophytes.

Table 1: Habitat Suitability Index Assessment Scoring System	
HSI Score	**Pond Suitability for GCN**
< 0.5	Poor
0.5 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
> 0.8	Excellent

Presence/Absence Survey

2.2.4 All surveys were completed by Wardell Armstrong LLP suitably qualified and experienced ecologists. All lead surveyors belong to the Chartered Institute of Ecology and Environmental Management (CIEEM) and hold a Natural England Level 1 class survey licence for GCN.

2.2.5 Field survey protocols followed English Nature (2001) and Gent & Gibson JNCC (2003). All waterbodies were subject to four survey visits in order to determine the presence or absence of GCN, with a view to undertake an assessment of the population size class if presence was established. All waterbodies were subject to torchlight surveys or bottle trap surveys along with egg searches and netting where site conditions allowed.

Torchlight Survey

1 million candlepower CluLite torches were used to scan the waterbodies after sunset. Accessible margins were walked slowly and any amphibians were recorded.

Bottle Trap Survey

Bottle trap construction and placement was undertaken using guidelines outlined by Gent & Gibson (2003) and following the protocol described by Griffiths et al. (1996). At each pond a maximum of thirty sampling points were established at approximately 2m intervals around accessible areas of shoreline. One trap was placed at each sampling point, enabling newt density to be calculated as the number of newts captured per 2m. Traps were left in place for no longer than fourteen hours and any captured newts were recorded and released where they were found.

Egg Searches

Egg searches were conducted during daytime visits to each waterbody and, where appropriate, at night under torchlight. Search effort was focused on submerged or floating vegetation around the waterbody margins.

2.2.6 Presence/absence surveys were conducted on the following dates:

- Survey visit 1 – 3rd May/4th May 2017;
- Survey visit 2 – 9th May/10th May 2017;
- Survey visit 3 – 11th May/12th May 2017; and
- Survey visit 4 – 16th May/17th May 2017.

2.2.7 Environmental conditions during the surveys were favourable to conduct GCN surveys. Temperatures during all four surveys were above 5°C and specific weather conditions for each visit are described in Appendix 2.

2.3 Survey Limitations

2.3.1 Waterbody 1 had a large amount of submerged vegetation, making it more difficult to trap. As a result, a lower number of traps were deployed than would normally be used for a pond of that size. Waterbodies 5 and 6 both had a large amount of thick scrub surrounding, preventing access to a large proportion of the banks. As a result, a lower number of traps than usual were also used in these two ponds. Furthermore, Waterbodies 1 and 4 were both shallow in parts, meaning that the amount of traps that could be deployed were limited to a lesser number than would normally be used for these ponds. However, given the number of ponds surveyed and results from the area as a whole, it is considered that these limitations have not compromised the conclusions within this report.

3 RESULTS

3.1 Desk Study Results

3.1.1 There are no historical records of GCN within 2km of the site.

3.2 Field Survey Results

3.2.1 No GCN were recorded in any of the waterbodies during the surveys. For a full breakdown of results, see Table 2. No additional amphibians were recorded unless stated. See Appendix 3 for raw data.

Table 2: Waterbody Descriptions, Photographs and Results		Survey Results
Waterbody 1 **Grid Reference SJ 99748 44475** A small, shallow waterbody with a large amount of emergent vegetation (bulrush (*Typha* sp.), reed-sweet grass (*Glyceria maxima*) and *Deschampsia* sp.), located within the north-west area of the site boundary. Surrounded by semi-improved calcareous grassland, plantation woodland and tall ruderals. Size: approximately 15m X 10m Depth: approximately 0.3m		Approximately 75% of the waterbody margins were accessible for survey. A small number of smooth newts were trapped and seen via torch survey in this waterbody. Bottle trap surveys were limited to the western side of the waterbody due to the large amount of submerged vegetation present and shallow water. **Visit One: No GCN, smooth newts trapped** **Visit Two: No GCN, smooth newts trapped** **Visit Three: No GCN, smooth newts trapped** **Visit Four: No GCN, smooth newts trapped and seen** HSI Score: 0.74 (good)

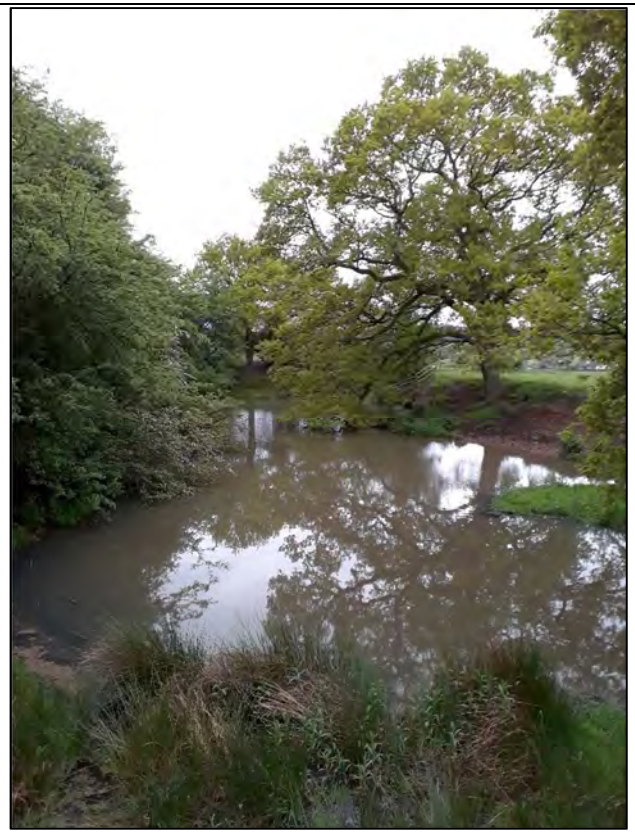
Waterbody 2 **Grid Reference SJ 99749 44135** A large waterbody with a private road surrounding, located within the eastern section of the site. Surrounding habitat consists of improved grassland, semi-improved calcareous grassland and scattered trees, with pastoral agricultural land beyond to the west and south, with the JCB industrial complex to the east. There is a small amount of emergent (bulrush, *Iris* sp., reed-sweet grass), marginal (hard rush (*Juncus inflexus*, *Deschampsia* sp.) and tall ruderal vegetation. Size: approximately 135m X 65m Depth: Unknown		100% of the waterbody margins were accessible for survey. Fish presence was noted, both large and small species, as well as waterfowl. Frogs and tadpoles were also found, indicating that the waterbody is utilised for breeding by amphibians. **Visit One: No GCN, tadpoles seen and trapped** **Visit Two: No GCN, tadpoles seen and trapped** **Visit Three: No GCN, tadpoles seen and trapped** **Visit Four: No GCN, tadpoles seen and trapped** HSI Score: 0.49 (poor)

Waterbody 3 **Grid Reference SJ 99961 43902** A small, shaded waterbody located approximately 50m south of the industrial complex perimeter. The pond is surrounded by semi-improved grassland, scattered trees and pastoral land. Emergent and marginal vegetation consists of bulrush, *Iris* sp., reed-sweet grass, hard rush (*Juncus inflexus*) and *Deschampsia* sp. Size: approximately 40m X 15m Depth: approximately 0.75m		Approximately 75% of the waterbody margins were accessible for survey due to wooded vegetation surrounding. A large amount of decaying leaf litter was noted in the pond. **Visit One: No GCN** **Visit Two: No GCN, tadpoles seen and trapped** **Visit Three: No GCN** **Visit Four: No GCN, tadpoles and common frog seen** HSI Score: 0.61 (average)

Waterbody 4 **Grid Reference SK 00231 43956** A small, shallow, shaded ditch stretching along a fence line adjacent to Waterbody 5 along the south-eastern site boundary. Semi-improved grassland and scattered plantation woodland borders the waterbody to the north. Hard rush grows in the margins, with bramble (*Rubus fruticosus* agg.) and silver birch (*Betula pendula*) present on the banks. Size: approximately 20m X 1.5m Depth: approximately 0.2m		100% of the waterbody margins were accessible for survey. A large amount of decaying leaf litter was noted in the waterbody. One smooth newt was found in this waterbody. **Visit One: No GCN** **Visit Two: No GCN, one smooth newt trapped** **Visit Three: No GCN** **Visit Four: No GCN** HSI Score: 0.43 (poor)

Waterbody 5 **Grid Reference SK 00190 43919** A medium sized waterbody located immediately to the south of the site boundary within a pastoral field. The pond is found between and in close proximity to Waterbody 4 and Waterbody 6. The pond is surrounded by thick gorse (*Ulex* sp.), occasional bramble and scattered trees. Beyond the pastoral land to the north is an area of plantation woodland. Size: approximately 65m X 25m Depth: approximately 1m		Approximately 50% of the waterbody margins were accessible for survey due to thick scrub surrounding. Fish and waterfowl presence were noted at this pond. **Visit One: No GCN** **Visit Two: No GCN** **Visit Three: No GCN** **Visit Four: No GCN** HSI Score: 0.59 (below average)

Waterbody 6 **Grid Reference SK 00233 43909** A medium sized waterbody located immediately to the south of the site boundary within a pastoral field. The pond is found immediately adjacent to the east of Waterbody 5. The pond is surrounded by thick gorse, hard rush, reed sweet-grass, bramble and scattered trees. Size: approximately 40m X 30m Depth: approximately 1m		Approximately 50% of the waterbody margins were accessible for survey. Waterfowl presence was noted at this pond as well as possible fish presence. A common frog was seen during the 4th GCN survey visit. **Visit One: No GCN** **Visit Two: No GCN** **Visit Three: No GCN** **Visit Four: No GCN, common frog seen** HSI Score: 0.64 (average)

Waterbody 7 **Grid Reference SJ 99646 43699** A large waterbody located within an area of woodland surrounded by pastoral land located approximately 350m south-west of the site boundary. The pond is surrounded by hard rush, bramble and scattered trees with, reed sweet-grass emerging. Size: approximately 60m X 20m Depth: Unknown		Approximately 80% of the waterbody margins were accessible for survey due to steep banks and overhanging vegetation. Tadpoles were trapped during the 4th GCN survey visit to this pond. **Visit One: No GCN** **Visit Two: No GCN** **Visit Three: No GCN** **Visit Four: No GCN, tadpoles trapped** HSI Score: 0.62 (average)

Waterbody 8 **Grid Reference SJ 99910 44733** A medium sized waterbody located approximately 30m east of the north-eastern site boundary. The pond is located on private land, in the garden of a farmhouse. Marginal vegetation consists of *Iris* sp., reed sweet-grass and tall ruderals, surrounded by improved grassland and scattered trees. Size: approximately 28m X 18m Depth: Unknown		This waterbody was ruled out from the survey effort due to the low HSI score, the major waterfowl and fish presence, and A522 acting as a barrier to amphibian dispersal. **Visit One: N/A** **Visit Two: N/A** **Visit Three: N/A** **Visit Four: N/A** HSI Score: 0.24 (poor)

4 CONCLUSION

4.1 No GCN were found in any of the waterbodies surveyed and consequently there are no constraints to development of the site in respect of GCN.

4.2 Other amphibians recorded to be present include smooth newts and common frogs. Smooth newts were found in Waterbody 1 and 3; common frogs were seen in Waterbodies 1, 2, 3, and 6, and tadpoles were seen in Waterbodies 2 and 3. Smooth newt and common frog are not protected or notable and do not need to be considered further.

5 REFERENCES

5.1 Gent A. H. & Gibson S. D. (2003). Herpetofauna Workers Manual, Peterborough, Joint Nature Conservation Committee.

5.2 Griffiths R. A., Raper S. J. & Brady L. D. (1996). Evaluation of a standard method for surveying common frogs *Rana temporaria* and newts *Triturus cristatus, T. helveticus* and *T. vulgaris.* JNCC Report no. 259. Peterborough, Joint Nature Conservation Committee.

5.3 Natural England (formally, English Nature), '*Great Crested Newt Mitigation Guidelines*' (2001). Natural England, Peterborough.

5.4 Oldham, R.S., Keeble, J., Swan, M.J.S. and Jeffcote, M., 2000. *Evaluating the suitability of habitat for the great crested newt* (*Triturus cristatus*). Herpetological Journal, *10*(4), pp.143-156.

APPENDIX 1

HSI Scores

HSI		WB1		WB2		WB3		WB4		WB5		WB6	
			SI value		SI value		SI value		SI value		SI value		SI value
Map location	**A/B/C**	A	**1**	A	**1**	A	**1**	A	**1**	A	**1**	A	**1**
Surface area	**rectangle/ellipse/irregular**	Ellipse	-	Ellipse	-	Ellipse	-	Rectangle	-	Ellipse	-	Ellipse	-
	area (m^2) =	60m^2	**0.1**	>2000m^2	-	60m^2	**0.1**	15m^2	**0.05**	100m^2	**0.1**	100m^2	**0.1**
Desiccation rate	**never/rarely/sometimes/frequently**	Never	**0.9**	Never	**0.9**	Never	**0.9**	Never	**0.9**	Never	**0.9**	Never	**0.9**
Water quality	**good/moderate/poor/bad**	Moderate	**0.67**	Moderate	**0.67**	Poor	**0.33**	Poor	**0.33**	Moderate	**0.67**	Moderate	**0.67**
Shade	% of margin shaded 1m from bank	30%	**1**	5%	**1**	75%	**0.8**	100%	**0.2**	10%	**1**	5%	**1**
Waterfowl	**absent/major/minor**	Absent	**1**	Minor	**0.67**	Absent	**1**	Absent	**1**	Minor	**0.67**	Minor	**0.67**
Fish population	**absent/possible/minor/major**	Absent	**1**	Major	**0.01**	Absent	**1**	Absent	**1**	Minor	**0.33**	Possible	**0.67**
Pond density	number of ponds within 1km	7	**1**	7	**1**	7	**1**	7	**1**	7	**1**	7	**1**
Terrestrial habitat	**good/moderate/poor/isolated**	Good	**1**	Moderate	**0.67**	Moderate	**0.67**	Moderate	**0.67**	Moderate	**0.67**	Moderate	**0.67**
Macrophyte cover	%	90%	**0.9**	15%	**0.45**	30%	**0.6**	5%	**0.35**	5%	**0.35**	5%	**0.35**
	HSI =		**0.7352**		**0.4918**		**0.6097**		**0.4339**		**0.5923**		**0.6358**
	provisional HSI =												
	Use provisional HSI value if above 0.75	Date:	21/04/17	Date:	21/04/17	Date:	21/04/17	Date:	21/04/17	Date:	21/04/17	Date:	21/04/17

HSI		WB7		WB8	
			SI value		SI value
Map location	**A/B/C**	A	**1**	A	**1**
Surface area	**rectangle/ellipse/irregular**	Ellipse	**-**	Ellipse	**-**
	area (m^2) =	80m^2	**0.1**	80m^2	**0.1**
Desiccation rate	**never/rarely/sometimes/frequently**	Never	**0.9**	Never	**0.9**
Water quality	**good/moderate/poor/bad**	Poor	**0.33**	Poor	**0.33**
Shade	% of margin shaded 1m from bank	20%	**1**	15%	**1**
Waterfowl	**absent/major/minor**	Minor	**0.67**	Major	**0.01**
Fish population	**absent/possible/minor/major**	Absent	**1**	Major	**0.01**
Pond density	number of ponds within 1km	7	**1**	7	**1**
Terrestrial habitat	**good/moderate/poor/isolated**	Good	**1**	Good	**1**
Macrophyte cover	%	20%	**0.5**	5%	**0.35**
	HSI =		**0.6205**		**0.2481**
	provisional HSI =				

Use provisional HSI value if above 0.75

Date:	21/04/17	Date:	21/04/17

APPENDIX 2

Weather Conditions

Weather Conditions					
Date	Precipitation	Cloud cover[1]	Wind[2]	Temperature	Notes
Visit 1					
03/05/2017	0	8	3	11C	
04/05/2017	0	1	3	10C	
Visit 2					
09/05/2017	0	0	0	11C	
10/05/2017	0	0	1	11C	
Visit 3					
11/05/2017	0	6	3	18C	
12/05/2017	0	6	3	13C	
Visit 4					
16/05/2017	0	8	2	17C	
17/05/2017	Light rain	8	1	11C	

[1] Cloud cover: based on Okta scale: 0 = cloudless, **1** = sparse clouds, **2** = 1/4 sky covered by cloud, **3** = 3/8, **4** = 1/2, **5** = 5/8, **6** = 3/4, **7** = 7/8, **8** = no sky visible, completely overcast

[2] Wind force: based on Beaufort wind force scale: **0** = calm, **1** = light air, **2** = light breeze, **3** = gentle breeze, **4** = moderate breeze

APPENDIX 3

Raw Data

Waterbodies	Visit 1		Visit 2		Visit 3		Visit 4		Comments
	PM	AM	PM	AM	PM	AM	PM	AM	
Great crested newt									
1	0	0	0	0	0	0	0	0	
2	0	0	0	0	0	0	0	0	Tadpoles, fish, waterfowl
3	0	0	0	0	0	0	0	0	Tadpoles
4	0	0	0	0	0	0	0	0	Almost dry on 4th visit
5	0	0	0	0	0	0	0	0	Fish, waterfowl
6	0	0	0	0	0	0	0	0	Waterfowl, possible fish
7	0	0	0	0	0	0	0	0	Waterfowl, tadpoles
8	-	-	-	-	-	-	-	-	Not surveyed
*** indicates maximum count for waterbody. # indicates maximum count for survey area.**									

Waterbodies	Visit 1		Visit 2		Visit 3		Visit 4		Comments
	PM	AM	PM	AM	PM	AM	PM	AM	
Smooth newt									
1	0	4	1	1	4	1	2	4	
2	0	0	0	0	0	0	0	0	Tadpoles, fish, waterfowl
3	0	0	0	0	0	0	0	0	Tadpoles
4	0	0	0	1	0	0	0	0	Almost dry on 4th visit
5	0	0	0	0	0	0	0	0	Fish, waterfowl
6	0	0	0	0	0	0	0	0	Waterfowl, possible fish
7	0	0	0	0	0	0	0	0	Waterfowl
8	-	-	-	-	-	-	-	-	Not surveyed
*** indicates maximum count for waterbody. # indicates maximum count for survey area.**									

DRAWING

KEY

- Site Boundary
- Waterbody

Notes:
Coordinates to British National Grid.

Boundaries are indicative. Aerial imagery shown for context purposes only.

REVISION	DETAILS	DATE	DRAWN	CHK'D	APP'D

CLIENT

JCB Group Central Facilities

PROJECT

Harewood Estate, Cheadle

DRAWING TITLE

Waterbody Location Plan

DRG No	SCALE	DATE
ST16225-002	1:5,000 @ A3	18/05/2017
DRAWN BY	CHECKED BY	APPROVED BY
JP	CM	CM

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