

A6 Manchester Airport Relief Road

*Great Crested Newt Survey Report –Pursuant to the Discharge of Planning conditions 15
(Stockport Metropolitan Borough Council) and 14 (Manchester City Council)*

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1.0 INTRODUCTION

This great crested newt *Triturus cristatus* survey report has been prepared by AECOM/Grontmij on behalf of Stockport Metropolitan Borough Council (SMBC).

AECOM/Grontmij Joint Venture were commissioned to carry out a suite of ecology surveys at the proposed A6 to Manchester Airport Relief Road (A6MARR) which comprising a 14 kilometre (km) dual carriageway between the A6 in the east (grid reference SJ 934 859) to Manchester International Airport in the west (grid reference SJ 817 857). Ten kilometres of the relief road will comprise new sections of dual carriageway. A central 4 km section of the relief road would comprise the previously constructed A555 south of Bramhall. In addition, a pedestrian and cycle route is proposed for the whole length of the scheme, including retrofitting it to the 4 km existing section of A555 and to the section of the A34 to the South of the Stanley Green Roundabout.

This report outlines the survey methodologies and presence of great crested newts (GCN) within the land available for development. The report highlights likely impacts and outlines initial recommendations for mitigation and enhancement.

The great crested newt habitat assessments and presence/absence surveys provide an update to surveys undertaken by Mouchel in 2013.

Following submission of the GCN licence by Mouchel for Styal Golf Course, Natural England raised concerns regarding the validity of the 2013 survey great crested newt survey data, and as such further surveys were required in 2014 to provide up-to-date survey data.

In addition, a planning condition was imparted by both SMBC and Manchester City Council (MCC) to provide detailed mitigation and compensation strategies for each meta-population of great crested newts, based on up-to-date survey information. Condition 15 for SMBC and 14 for MCC outlines that *'No development shall take place until detailed mitigation/compensation strategies for the following species (which includes great crested newts) have been submitted to and approved by the local planning authority and that the strategies are to be based on up to date survey data.'* To inform the mitigation strategy, great crested newt surveys were undertaken to identify great crested newt population extents within the Route Corridor and a 250 metre (m) radius.

The results of this report will be used to design the mitigation strategy, which will also form the basis of the GCN Natural England Licence.

The proposed route and surrounding survey area (within 250 m) are hereafter referred to as the Route Corridor and 250 m buffer.

1.1 Site Location and Setting

The proposed relief road would be constructed between the A6 (grid reference SJ 934 859) to Manchester International Airport in the west (grid reference SJ 817 857), bypassing Bramhall, Cheadle Hulme, Hazel Grove, Handforth, Poynton and Wythenshawe District Centres and Gatley and Heald Green Local Centres. The current land use is a mixture of agricultural land (arable and pasture), primarily semi-improved and improved fields with hedgerows and trees, woodland (including an area of ancient woodland), watercourses, ponds, and a number of golf courses. The route also encompasses the existing A555. There are several watercourses along the route, some running adjacent to and others being crossed by the new road.

1.2 Objectives of the Study

This report is based on GCN habitat assessments and presence/likely absence surveys carried out by AECOM/Grontmij in 2014. The objectives of the surveys were to:

- Review the survey data provided by Mouchel 2013;
- Identify whether GCNs are using any of the waterbodies located within, and up to 250 m of the proposed route corridor;
- Identify if any other amphibian species are using the waterbodies;
- Provide GCN population size estimates, if present;

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- Recommend mitigation measures potentially required to prevent or reduce any negative impacts to GCN, if found; and
 - Establish where licences are required for works to proceed.

1.3 Legislation

There are several different acts of legislation and regulations which refer to the protection of wildlife. Legislation with particular relevance to great crested newts is outlined below.

This is a brief summary of the legislation and is not to be regarded as a definitive legal opinion. When dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.

The great crested newt is fully protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of The Conservation of Habitats and Species Regulations 2010 (as amended) making it a European Protected Species.

It is an offence for anyone intentionally to kill, injure or disturb a great crested newt, to possess one (whether live or dead), or sell or offer 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.

1.3.1 Section 41 Priority Species

Section 40 of the Natural Environment and Rural Communities (NERC) Act, requires member states “to have regard” to the conservation of biodiversity in all their activities. Member states are required to publish a list of habitats and species of principal importance to the conservation of biodiversity. In England this is implemented through the Section 41 list of habitats and species. This includes English priority species and species previously listed as priority species under the UK Biodiversity Action Plan (BAP).

1.3.2 Local Biodiversity Action Plan (LBAP)

Each local authority has a LBAP which is used to translate National targets for species and habitats into actions which can be undertaken at a local level. Species and habitats of local conservation concern or value are included in the LBAP and an action plan is created for each species. The site lies within the Cheshire and Greater Manchester Local Authorities' areas. GCN are included on both lists of the Cheshire BAP (Countdown) and Greater Manchester BAP.

1.4 Quality Assurance

This project has been undertaken in line with AECOM's Integrated Management System (IMS). Our IMS places great emphasis on professionalism, technical excellence, quality, environmental and Health and Safety management. All staff members are committed to establishing and maintaining our certification to the international standards BS EN ISO 9001:2008 and 14001:2004 and BS OHSAS 18001:2007. In addition our IMS requires careful selection and monitoring of the performance of all sub consultants and contractors.

All AECOM/Grontmij Ecologists are members of (at the appropriate level) the Chartered Institute of Ecology and Environmental Management (CIEEM) and follow their code of professional conduct when undertaking ecological work.

2.0 METHODOLOGIES

2.1 Desk Top Study

The objectives of the desk study were to identify existing records for great crested newts both within and up to 2 km from the proposed route corridor. Any Special Areas of Conservation (SACs) or Sites of Special Scientific Interest (SSSIs) designated because of a known GCN population up to 2 km from the site were also identified.

Information relating to designated sites was collated using the Magic website (<http://www.magic.gov.uk/>). The National Biodiversity Network (NBN) Gateway (www.nbn.org.uk) was used to collate historical records of great crested newt within the study area within 2 km of the route corridor and the 10 km grid squares SJ88 and SJ98.

Two local biological record centres, RECORD and Greater Manchester Ecology Unit (GMEU) were also contacted for great crested newt records up to 2 km from the route corridor.

2.2 Literature Review

The following ecological survey reports/documents were reviewed prior to undertaking the 2014 GCN surveys:

- Mouchel (2013) A6 to Manchester Airport Relief Road Environmental Statement;
- Mouchel (2013) Styal Golf Course Great Crested Newt *Triturus cristatus* Report; and
- Mouchel (2013) A6 Marr GCN Licence Phased Masterplan Draft.

2.3 Great Crested Newt Habitat Assessments

In 2014, from previous surveys, mapping and aerial photos, AECOM/Grontmij identified 181 ponds (including 1 drainage ditch) within 250 m of the proposed route corridor, with some areas of ponds greater than 250 m also assessed to establish extents of Metapopulations or suitability for potential mitigation areas. Of these, 33 were found to not exist, and 28 were found to be dry or were not suitable for GCN. The remaining 120 were subjected to surveys.

Raw data for the surveys can be found in Appendix A. The raw data includes 262 ponds, of which 81 ponds were determined to be out of scope for further surveys due to their location or distance from the proposed route corridor.

Where access was permitted, the ponds (on the nearside of major barriers) were assessed for their potential to support great crested newts during April, May and June 2014.

The Habitat Suitability Index (HSI) is a tool used to provide a numerical indication of the quality of a waterbody in terms of GCN breeding and associated habitat requirements on a scale of 0-1 (0 indicating unsuitable habitat, 1 representing optimal habitat). HSI scores incorporate ten Suitability Indices (SI), all of which are factors thought to affect GCN, namely:

- SI1 site location;
- SI 2 size of the pond;
- SI 3 pond drying;
- SI 4 water quality;
- SI 5 perimeter shading;
- SI 6 presence of waterfowl;
- SI 7 presence of fish;
- SI 8 number of ponds within 1 km;
- SI 9 terrestrial habitat; and
- SI 10 Macrophyte cover.

Once a measurement or category has been given for each SI this can be converted to a figure between 0 and 1 for use in the HSI calculation. This figure is either translated from an assigned category or measurement or read from a graph in the case of a percentage or number. The HSI is then calculated from the following formula:

$$HSI = (SI1 \times SI2 \times SI3 \times SI4 \times SI5 \times SI6 \times SI7 \times SI8 \times SI9 \times SI10)$$

This will give a final HSI result between 0 and 1 presenting a measure of habitat suitability for GCN.

Typically, presence/absence surveys would be undertaken on waterbodies considered to offer suitable habitat opportunities, i.e. those which receive a score between 0.5 and 1.

It should be noted that the GCN HSI is a tool only and professional experience and judgement is also important when carrying out habitat assessments. A high score does not guarantee the presence of GCN within a particular waterbody, or vice versa. In general however, waterbodies with high scores are more likely to support GCN than those with low scores.

2.4 Great Crested Newt Presence/ Absence Surveys

The GCN presence/ likely absence survey methodology followed guidance provided in English Nature (2001) 'Great Crested Newt Mitigation Guidelines' which involved employing at least three appropriate survey methodologies (where possible), including; bottle trapping, torch surveys, refuge search, egg searching and netting. The survey methodologies are discussed in more detail below and were undertaken on at least four separate

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occasions. Almost all ponds were subjected to at least two of the surveys during the optimal survey window, between mid- April and mid- May. Access problems delayed some of the second visits to the third week in May, however these are discussed within the limitations section.

After the initial four surveys, an additional two surveys are required on any ponds in which GCN are found to be present. The purpose of the two additional surveys is to give an estimation of the population size and to support any Natural England development licence application.

Survey methodologies were set out in the A6 Manchester Airport Relief Road Great Crested Newt Survey Protocol produced by AECOM/Grontmij in 2014 and agreed by Natural England prior to the commencement of surveys. All surveys were conducted in appropriate weather conditions and always with minimum overnight temperatures of greater than 5°C.

2.4.1 Bottle Trapping

Bottle traps are set around the margin of the waterbody in the evening and left overnight to catch adults during the breeding season. Traps are set at an approximate density of one trap per two metres of shoreline dependent on individual site variations. The guidelines set out by Natural England (previously known as English Nature) should be followed strictly to ensure the welfare of trapped newts and other aquatic organisms.

2.4.2 Torch Survey

The waterbody is thoroughly searched using a torch between dusk and midnight. Powerful torches should be used, with 50,000 candlepower as a recommended minimum.

The surveyors walk slowly around the perimeter of the waterbody at least once (where access is possible), checking for newts in the beam of the torchlight. Care should be taken to minimise disturbance to the newts and other wildlife which may be present (e.g. nesting birds). To allow comparison between ponds, the same power of torch should be used on every survey occasion.

2.4.3 Egg Search

Submerged and floating aquatic vegetation is checked by the surveyor in order to confirm presence/absence of great crested newt eggs. This is often a very effective method for detecting great crested newt presence, but eggs can prove difficult to find in heavily vegetated ponds with small newt populations, or those with no accessible vegetation. Egg searches are terminated when the presence of GCN is confirmed to avoid excess damage to the eggs. This method is unreliable for population estimates.

2.4.4 Refuge Search

This technique involves lifting up and looking under objects such as logs, stones etc close to the pond perimeter, which may be used by great crested newts for refuge purposes.

2.4.5 Netting

This involves sweep netting the pond, using a hand held pond net, for 15 minutes per 50 m of pond perimeter.

2.5 Limitations

It was only possible to survey Pond 219 on one occasion due to health and safety reasons. This pond was surveyed in 2013 however and found to be absent of GCN.

A number of ponds, including 25a, 47, and 108b were not subjected to the complete four or six survey visits as these ponds were periodically dry during the survey period. Surveys were conducted on any occasion when they held water. These ponds and a number of others throughout the survey area appear to only hold water during periods of flash flooding.

Pond 85 was found to be dry on the 6th visit so received only five surveys. GCN were only recorded in Pond 85 on the 3rd visit, with a max count of one.

Ponds 10a and 22 were no longer suitable for survey by the 3rd survey visit, Pond 131a was dry by the 4th visit and Pond 109 was dry by the 2nd visit.

A number of ponds received no surveys as they were found to be dry on the first visit please refer to the raw data in Appendix A.

A number of ponds no longer exist, please refer to the raw data in Appendix A.

A small number of ponds in the scheme did not include half of the visits between mid April and mid May due to restrictions on access provision; however the surveys were conducted during appropriate conditions. In addition, the cooler weather conditions at the start of the survey season delayed the season overall and it is considered that surveys conducted just after mid May were appropriate and reflect those to be conducted just prior to mid May.

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Pond 130 visits were delayed further as access was denied after the first visit until the beginning of June. This pond lies just greater than 250 m from the route corridor of the existing A555 where there are only minor works, and in addition, no GCN were found in ponds in this area.

3.0 RESULTS

This chapter presents the results of the desk study and literature review of previous surveys, and details the results of the 2014 GCN surveys by AECOM/Grontmij.

3.1 Desk Study 2014

No SACs or SSSIs designated for the conservation of great crested newts have been identified within 2 km of the site.

NBN provided eleven records of great crested newt within the 10 km grid square SJ98 from the last ten years, the most recent of which was from 2013. A further forty eight records were within the 10 km grid square SJ88, the most recent from 2012.

RECORD provided five records of great crested newt within 2 km of the route corridor dating back to 2008. Four of the records are referenced to SJ873819 and one record is referenced to SJ948845. None of the records are within 250 m of the route corridor. The 2013 records from GMEU supplied to Mouchels can be found in the literature review in Section 3.2 below. GMEU records supplied to AECOM/Grontmij in 2014 are summarised in Tables 1 and 2 below, showing the records provided for records of ponds absent of GCN, and those ponds confirmed to contain GCN respectively. The closest pond ID to each record is also provided.

Table 1 GMEU Records of Ponds Absent of Great Crested Newt within 2 km of the Survey Area

Grid Reference of Record	Date	Comments	Distance From Scheme (m)	Nearest AECOM/Grontmij Pond ID	AECOM/Grontmij Pond X Ref	AECOM/Grontmij Pond Y Ref
SJ86318492	08/05/2002	Absent - No GCN found	347			
SJ86238510	10/05/2002	Absent - No GCN - smooth only	464	256	386237	385105
SJ86148510	10/05/2002	Absent - No GCN - Smooth only	526	255	386140	385099
SJ86148475	10/05/2002	Absent - No GCN	180	97	386140	384750
SJ86138471	10/05/2002	Absent - No GCN	144			
SJ86048478	10/05/2002	Absent - No GCN	213			
SJ86508505	10/05/2002	Absent - No GCN	187	257	386506	385049
SJ88438326	01/05/2007	Absent - frog toad	496	137	388425	383253
SJ88438323	01/05/2007	Absent - toad, frog toad	526			
SJ88528315	01/05/2007	Absent - frog smooth toad	567			
SJ88698328	01/05/2007	Absent - toad, frog, smooth, fish	389	142	388693	383304
SJ88868319	01/05/2007	Absent - smooth, toad, frog	420	144	388854	383185
SJ88558259	01/05/2007	Absent - no amphibians wheel wash toad	1109			
SJ88318251	01/05/2007	Absent - smooth frog toad	1239			
SJ87968329	18/04/2011	Absent - frog only	534	126	387961	383291
SJ87848362	18/04/2011	Absent - no amphibians recorded	191	125	387856	383635
SJ87548344	18/04/2011	Absent - common toad only	463	120	387544	383446

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Table 2 GMEU Confirmed Records of Great Crested Newt within 2 Km of the Survey Area

Grid Reference of Record	Date	Comments	Distance From Scheme (M)	Nearest AECOM /Grontm ij Pond ID	AECOM/Grontmij Pond X Ref	AECOM /Grontm ij Pond Y Ref
SJ86388500	10/05/2002	Breeding	308	102	386378	385008
SJ86248493	08/05/2002	Eggs	359	98	386240	384934
SJ86208507	19/05/2002	Eggs	489	101	386213	385073
SJ86188486	09/05/2002	Breeding	304	100	386195	384867
SJ86748477	10/05/2002	Breeding	19			
SJ86768479	09/05/2002	Breeding	10	111	386768	384804
SJ86738489	10/05/2002	Breeding	21	105	386732	384899
SJ86678478	09/05/2002	Eggs	55	103	386676	384789
SJ832862	01/01/1988	no recent survey following development	809			
SJ958864	01/01/1987		1959			
SJ825841	01/05/2002		1361			
SJ825840	01/05/2002		1418			
SJ825839	01/05/2002		1472			
SJ824839	01/05/2002		1525			
SJ824839	01/05/2002		1484			
SJ824838	01/05/2002		1508			
SJ823838	01/05/2002		1612			
SJ825841	01/05/2002		1341			
SJ825841	01/05/2002		1362			
SJ826839	01/05/2002		1355			
SJ826838	01/05/2002		1398			
SJ826839	01/05/2002		1312			
SJ826839	01/05/2000		1286			
SJ828839	01/05/2002		1169			
SJ827841	01/05/2002		1203			
SJ827840	01/05/2002		1145			
SJ934880	01/05/2003	small population	1853			
SJ841848	01/05/2003	small population	0	34	384172	384831
SJ841848	01/05/2003	small population	0	34	384172	384831
SJ845844	01/05/2003	medium population	0	67	384526	384470
SJ845844	01/05/2003	medium population	15	67	384526	384470
SJ847844	01/05/2003	small population	0	78	384700	384400
SJ844844	01/05/2003	small population	59	58	384420	384456
SJ843844	01/05/2003	medium population	120			
SJ843843	01/05/2003	medium population	163			
SJ844843	01/05/2003	small population	144			
SJ844841	01/05/2003	medium population	287			
SJ853842	01/05/2003	small populations	77	91a	385348	384274
SJ848841	01/05/2003	small population	137			
SJ836850	01/05/2003	Pond lost to car park development, GCN translocated	96	17	383682	385033
SJ914822	01/05/2003		1744			
SJ913844	01/05/2003		0	208	391383	384486
SJ901838	01/05/2003	medium population	12	169	390181	383854
SJ910820	01/05/2003	EIA SEMMMS	1729			
SJ894836	01/05/2003	EIA SEMMMS	23	147	389441	383598
SJ898835	01/05/2003	EIA SEMMMS	0	153	389811	383579
SJ909842	01/05/2003	EIA SEMMMS	131	196	391000	384227
SJ903843	01/05/2003	EIA SEMMMS	139			

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Grid Reference of Record	Date	Comments	Distance From Scheme (M)	Nearest AECOM /Grontm ij Pond ID	AECOM/Grontmij Pond X Ref	AECOM /Grontm ij Pond Y Ref
SJ911842	01/05/2003	EIA SEMMMS	136			
SJ935860	01/07/2003	GCN larvae	29	232	393531	386084
SJ86738489	20/09/1998	Larvae	25	105	386732	384899
SJ86778479	20/09/1998	Larvae	14	111	386768	384804
SJ84158418	01/05/2004	small pop	446			
SJ84058405	01/05/2004	medium pop	464			
SJ 84218399	01/05/2004	medium pop	553			
SJ84288405	01/05/2004	small pop	475			
SJ84688400	01/05/2004	small pop	273			
SJ84758401	01/05/2004	small pop	264			
SJ84708395	01/05/2004	medium pop	332	77	384691	383934
SJ85248480	01/05/2004	small pop	282	92	385307	384794
SJ85358478	01/05/2004	small pop	234			
SJ90458475	01/05/2004	small pop	302			
SJ91058397	01/05/2004	small pop	388	197	391022	383965
SJ90958395	01/05/2004	small pop	343	194	390959	383948
SJ93348610	01/05/2004	small pop	26	231a	393376	386094
SJ84168414	01/05/2004	medium pop	425			
SJ84468412	01/05/2004	small pop	306	66	384507	384085
SJ88078339	18/04/2011	fish pond common toad	419	128	388069	383398
SJ8782683658	01/05/2006		188	125	387856	383635
SJ87928279	01/05/2007	GCN smooth frog v large toad	1037			
SJ88778284	01/05/2007	GCN smooth frog	784			
SJ88768270	01/05/2007	GCN smooth frog	918			
SJ88838315	01/05/2007	GCN smooth	472			
SJ899832	01/05/2003		270	160	389954	383206
SJ87758339	18/04/2011	survey GCN, smooth & palmate	450	123	387743	383396
SJ87778355	18/04/2011	GCN, smooth & palmate	285	124	387772	383569
SJ8808083405	01/05/2006	adult GCN trapped on building site Pennine ecological 2011	454			
SJ87748314	18/04/2011	common toad & fish	710			
SJ87828317	18/04/2011	Common toad & fish	643			
SJ 8637885008	20/09/2013	Pond no longer exists	312			
SJ 8409883891	01/01/2013	Peak count 7	630	29	384098	383891
SJ 8409883839	01/01/2013	Peak count 2	679	30	384098	383839
SJ 8415783683	01/01/2013	Peak count 1	842	31	384157	383683
SJ 8421483787	01/01/2013	Peak count 7	729	40	384214	383787
SJ 8424983988	01/01/2013	Peak count 6	551	42	384249	383988
SJ 8425484124	01/01/2013	Peak count 2	426	44	384254	384124

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Grid Reference of Record	Date	Comments	Distance From Scheme (M)	Nearest AECOM /Grontm ij Pond ID	AECOM/ Grontmij Pond X Ref	AECOM /Grontm ij Pond Y Ref
SJ 84294 83634	01/01/2013	Peak count 7. Eggs present	791	48	384294	383634
SJ 84324 84426	01/01/2013	Peak count 11. Eggs present	127	52	384324	384426
SJ 84409 84348	01/01/2013	Peak Count - 25. Eggs present	157	57	384409	384348
SJ 84457 84346	01/01/2013	Peak count 1	139	60	384457	384346
SJ 84467 83792	01/01/2013	Peak Count 10. Eggs present	564	62	384467	383792
SJ 84493 84139	01/01/2013	Peak count 1	290	65	384493	384139
SJ 84550 84439	01/01/2013	Peak Count - 30. Eggs Present	17	68	384550	384439
SJ 84575 83603	01/01/2013	Peak count 54.	699	69	384575	383603
SJ 84815 84137	01/01/2013	Peak Count 3.	138	81	384815	384137
SJ 86732 84899	01/01/2013	Peak count 3	23	105	386732	384899
SJ 86745 84775	01/01/2013	Peak count 1	24	108	386745	384775
SJ 86768 84804	01/01/2013	Peak count 2	9	111	386768	384804
SJ 89919 83706	01/01/2013	Peak Count 1	0	157	389919	383706
SJ 90343 84378	01/01/2013	Peak Count 5. Eggs Present	130	176	390343	384378
SJ 90541 84461	01/01/2013	Peak Count 1	8	180	390541	384461
SJ 91189 84260	01/01/2013	Peak Count 3	157	205	391189	384260
SJ 93575 86052	01/01/2013	Peak count 5	61			
SJ 93587 85978	01/01/2013	Peak Count 5	54	234	393587	385978
SJ 93668 86063	01/01/2013	Peak Count 7	171			
SJ 93700 86000	01/01/2013	Peak count 6. Eggs present	118	236	393725	386006
SJ 93981 86300	01/01/2013	Peak count 23. Eggs present	516	238	393981	386300
SJ 94439 85308	01/01/2013	Peak Count 6. Eggs present	468	241	394439	385308
SJ 89783 83809	01/01/2013	Peak count 12	0	259	389783	383809
SJ 91241 84402	01/01/2010	Peak count 3	32	206	391241	384402
SJ 90589 84619	01/01/2010	Peak count 1	169	182	390589	384619
SJ891418213 3	02/05/2013	11 observed - licence return	1445			
SJ891418213 3	10/05/2013	8 observed - licence return	1445			
SJ891418213 3	29/04/2013	22 observed - licence return	1445			

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Grid Reference of Record	Date	Comments	Distance From Scheme (M)	Nearest AECOM /Grontm ij Pond ID	AECOM/ Grontmij Pond X Ref	AECOM /Grontm ij Pond Y Ref
SJ8914182133	21/05/2013	4 observed - licence return	1445			
SJ8914182133	27/05/2013	3 observed - licence return	1445			
SJ8914182133	07/06/2013	2 observed - licence return	1445			
SJ90808237	03/05/2013	Low population	1331			

3.2 Literature Review

3.2.1 Desk Study Review

The NBN search undertaken by Mouchel in 2013 provided records for great crested newts within the 10 km grid squares of SJ88 and SJ98, and GMEU records within 1 km of the route corridor.

The National Biodiversity Network (NBN) Gateway (www.nbn.org.uk) was used to collate historical records of great crested newt within the study area and the 10 km grid squares SJ88 and SJ98.

Seventeen records of great crested newt were located within the 10 km grid square SJ98 from the last ten years, the most recent of which was from 2008. In addition a further seventy records were highlighted within the 10 km grid square SJ88, the most recent record is from 2008' (Mouchel, 2013).

Table 3, taken from the Great Crested Newt Survey Report (Appendix 11C) of the Environmental Statement (ES) (Mouchel, 2013), summaries great crested newt records provided by GMEU.

Table 3 Records of Great Crested Newt within 1 km of the Survey Area

Record Location (O.S. Grid Ref.)	Approximate Distance from Scheme Boundary
SJ 833 862	750 m
SJ 836 850	70 m
SJ 841 848	0 m
SJ 843 848	0 m
SJ 843 844	100 m
SJ 844 844	80 m
SJ 844 841	225 m
SJ 845 840	250 m
SJ 844 843	135 m
SJ 845 844	0 m
SJ 847 844	50 m
SJ 840 840	250 m
SJ 842 841	600 m
SJ 840 840	700 m
SJ 842 839	650 m
SJ 843 840	600 m
SJ 846 839	520 m
SJ 847 840	520 m
SJ 846 839	500 m
SJ 848 841	300m
SJ 853 842	130 m
SJ 853 847	280 m
SJ 863 850	460 m
SJ 426 849	360 m
SJ 862 848	300 m
SJ 867 848	160 m
SJ 867 847	40 m
SJ 866 847	60 m
SJ 878 836	265 m

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Record Location (O.S. Grid Ref.)	Approximate Distance from Scheme Boundary
SJ 880 833	500 m
SJ 888 831	500 m
SJ 887 827	1000 m
SJ 887 828	800 m
SJ 894 835	100 m
SJ 898 835	130 m
SJ 899 832	400 m
SJ 901 838	0 m
SJ 903 843	215 m
SJ 904 847	420 m
SJ 909 839	420 m
SJ 910 839	430 m
SJ 910 842	126 m
SJ 912 843	0 m
SJ 913 844	50 m
SJ 934 861	130 m
SJ 933 860	65 m

3.2.2 Past Survey Review

Great crested newt surveys were undertaken in relation to the route corridor by Mouchel in 2010 and 2013, and for a previous planning application by Penny Anderson Associates in 2007. The results of the 2013 surveys were used to inform the scheme's Environment Impact Assessment (EIA), in support of an application for planning permission. The Great Crested Newt Survey Report (Appendix 11C) of the (ES (Mouchel, 2013) was reviewed for information prior to AECOM/Grontmij undertaking the 2014 GCN surveys to determine which ponds have been identified as GCN ponds to date and to identify further survey requirements at the site. Complete and up-to-date survey information is required to satisfy the planning conditions and support the Natural England GCN mitigation licence/s required. The tabulated results from 2010 and 2013 can be found below.

In 2013, Mouchel identified the following for Habitat Assessment and surveys throughout the survey area (A6 Marr GCN Licence Phased Masterplan Draft – Mouchel 2013);

'A total of 247 waterbodies were identified using maps, previous data and other sources, however, when visited, 46 of these ponds no longer existed and the locations were scoped out immediately. A further 40 were scoped out of further assessment as they were behind significant barriers for great crested newt dispersal (roads, urban development, running watercourses etc), and an additional 54 were scoped out for the reasons below:

- *Habitat totally unsuitable for great crested newts – 14;*
- *Land owner permission to access land not given and pond not visible at all – 4;*
- *Waterbody comprised running water (stream, flowing ditch etc) – 2;*
- *Waterbody was outside 500m from any works – 5; and*
- *No significant works within 500m – 29.*

This left 107 ponds which were all subject to an HSI study. Some of these ponds were surveyed from publicly accessible land, due to lack of landowner access consent, but where the pond was visible from a footpath or bridleway, and therefore the effectiveness of the assessment for these ponds may have been limited by lack of surveyor visibility.

Of the 107 ponds which were subject to an HSI, 102 scored 0.50 and above or were found within the redline boundary and were therefore subjected to surveys for great crested newt presence. Remaining ponds were excluded from the survey as they were either outside of the scheme zone of influence or landowner access was not provided.

The results for the population class sizes, of the 102 ponds surveyed by Mouchel in 2013, are presented below in Table 4. The basis for the use of these estimates is derived from historical knowledge of the absolute numbers of newts regularly present in areas and the returns of historical surveys of them, given that the level of survey effort specified within the guidelines were applied.'

Great Crested Newt Surveys

Table 4 Results for the Population Class Sizes, Mouchel 2013

Population Size Class	Number of Ponds
Absent	56
Small	23
Medium	6
Large	0
Access denied for field surveys	6
Dried out before/during survey	11
Total	102

The scheme-wide survey results are presented in Map 2.2a (HSI Study) and 2.2b (GCN Survey) of The Great Crested Newt Survey Report (Appendix 11C) of the ES (Mouchel, 2013).

The Results of the 2010 and 2103 great crested newt presence/ absence surveys undertaken by Mouchel can be found in Tables 5-8 below (Mouchel, 2013).

Table 5 Results of 2010 Survey Expressed as Peak Counts

Pond Number	HSI Score	Overall Peak Counts	Eggs Found	Population Size Class
18	0.60	0	No	Absent
44	0.81	16	Yes	Medium
55	0.77	5	No	Small
57	0.81	22	No	Medium
60	0.62	5	No	Small
65	0.86	16	No	Medium
66	0.70	2	No	Small
67	0.70	3	No	Small
68	0.83	24	Yes	Medium
73	0.68	20	No	Medium
78	0.59	1	No	Small
79	0.75	3	No	Small
81	0.78	6	No	Small
90	0.62	0	No	Absent
91	0.63	4	No	Small
93	0.66	0	No	Absent
109	0.74	0	No	Absent
110	0.70	0	No	Absent
121	0.68	0	No	Absent
133	0.43	0	No	Absent
135	0.67	0	No	Absent
140	0.73	0	No	Absent
144	0.79	0	No	Absent
149	0.66	0	No	Absent
151	0.76	0	No	Absent
157	0.69	0	No	Absent
159	0.60	0	No	Absent
160	0.72	0	No	Absent
167	0.60	0	No	Absent
168	0.63	0	No	Absent
172	0.78	0	No	Absent
175	0.68	0	No	Absent
182	0.64	1	No	Small
190	0.69	0	No	Absent
194	0.66	0	No	Absent
196	0.73	0	No	Absent
197	0.66	6	No	Small

Great Crested Newt Surveys

Pond Number	HSI Score	Overall Peak Counts	Eggs Found	Population Size Class
198	0.77	4	Yes	Small
203	0.83	9	No	Small
205	0.79	6	No	Small
206	0.67	3	Yes	Small
208	0.65	0	No	Absent
217	0.60	1	No	Small
222	0.68	0	No	Absent
233	0.91	11	No	Medium
234	0.94	13	No	Medium
235	0.88	4	No	Small
236	0.90	7	No	Small
240	0.80	1	No	Small

Table 6 Summary of 2010 Survey Results by Population Size Class

Population Size Class	Number of Ponds
Absent	25
Small	19
Medium	7
Large	0
Unknown (denied access for survey)	2
Total	49

*Please note that this is a copy of the table from the report and above values have not been changed.

Table 7 Results of 2013 Survey Expressed as Peak Counts

Pond Number	HSI Score	Overall Peak Counts	Eggs Found	Population Size Class
29	0.55	7	Yes	Small
30	0.58	2	Yes	Small
31	0.65	1	Yes	Small
34	0.65	0	No	Absent
39	0.7	0	No	Absent
40	0.59	7	Yes	Small
42	0.56	6	Yes	Small
44	0.52	2	No	Small
47	0.47	0	No	Dried out during survey
48	0.73	7	Yes	Small
49	0.83	0	No	Absent
52	0.8	11	Yes	Medium
55	0.59	0	No	Absent
57	0.7	25	Yes	Medium
58	0.78	0	No	Absent
59	0.73	0	No	Absent
60	0.54	1	No	Small
62	0.78	10	Yes	Small
63	0.54	0	No	Dried out during survey
64	0.57	0	No	Dried out during survey
65	0.67	1	No	Small
66	0.29	0	No	Absent
67	0.55	0	No	Absent
68	0.68	30	Yes	Medium
69	0.75	54	No	Medium
72	0.7	0	No	Absent
73	0.38	0	No	Absent

Great Crested Newt Surveys

Pond Number	HSI Score	Overall Peak Counts	Eggs Found	Population Size Class
76	0.6	N/A	N/A	No Access
77	0.66	0	No	Dried out during survey
78	0.44	0	No	Absent
79	0.5	0	No	Absent
80	0.62	0	No	Absent
81	0.73	3	No	Small
83	0.63	0	No	Absent
84	0.71	0	No	Dried out during survey
85	0.51	0	No	Dried out during survey
87	0.67	0	No	Absent
88	0.52	0	No	Dried out during survey
89	0.29	0	No	Absent
90	0.31	0	No	Absent
91	0.44	0	No	Absent
92	0.62	0	No	Dried out during survey
94	0.31	0	No	Absent
101	0.45	0	No	Absent
103	0.59	0	No	Absent
105	0.78	3	No	Small
108	0.88	1	No	Small
110	0.45	N/A	N/A	No Access
111	0.8	2	No	Small
147	0.6	0	No	Absent
148	0.71	0	No	Absent
149	0.76	0	No	Absent
150	0.33	N/A	N/A	No Access
152	0.76	0	No	Absent
153	0.39	N/A	N/A	No Access
157	0.68	1	No	Small
159	0.60	0	No	Absent
160	0.73	0	No	Absent
163	0.59	N/A	N/A	No Access
166	0.59	0	No	Absent
167	0.60	0	No	Absent
168	0.63	0	No	Absent
169	0.66	N/A	N/A	No Access
171	0.5	0	No	Absent
172	0.71	0	No	Absent
174	0.7	0	No	Absent
175	0.67	0	No	Absent
176	0.51	5	Yes	Small
180	0.8	1	No	Small
185	0.63	0	No	Absent
188	0.66	0	No	Absent
189	0.79	0	No	Absent
190	0.45	0	No	Absent
194	0.59	0	No	Absent
195	0.65	0	No	Absent
196	0.59	0	No	Absent
197	0.68	0	No	Absent
198	0.62	0	No	Absent
201	0.52	0	No	Absent
205	0.43	3	No	Small

Great Crested Newt Surveys

Pond Number	HSI Score	Overall Peak Counts	Eggs Found	Population Size Class
206	0.43	0	No	Absent
208	0.58	0	No	Absent
214	0.58	0	No	Absent
215	0.54	0	No	Dried out during survey
216	0.75	0	No	Absent
217	0.61	0	No	Absent
219	0.69	0	No	Absent
222	0.59	0	No	Absent
223	0.8	0	No	Absent
231	0.62	0	No	Absent
232	0.64	0	No	Dried out during survey
233	0.71	5	No	Small
234	0.82	5	No	Small
235	0.79	7	No	Small
236	0.73	6	Yes	Small
238	0.62	23	Yes	Medium
239	0.7	N/A	N/A	No Access
240	0.66	0	No	Absent
241	0.81	6	Yes	Small
259	0.8	12	No	Medium
260	0.61	0	No	Absent

Table 8 Summary of 2013 Survey Results by Population Size Class

Population Size Class	Number of Ponds
Absent	55
Small	23
Medium	6
Large	0
Access denied for field surveys	7
Dried out during survey	10
Total	101

3.3 2014 Great Crested Newt Habitat Assessments

As stated, 181 ponds (including 1 drainage ditch) were identified within 250 m of the route corridor by AECOM/Grontmij in 2014, with the majority of ponds between 250 m and 500 m omitted, with exceptions for ponds assessed to establish extents of Metapopulations, or where information was required to establish suitability for mitigations areas. Of these, 33 were found to not exist, and 28 were found to be dry or were not suitable for GCN. The remaining 120 were subjected to surveys.

The following areas were included or excluded in the 2014 GCN surveys:

- Ponds along the existing A555 were considered outside of the scope of works in 2013; however ponds within 250 m of this existing road were included in 2014 due to the proposed Cycleway and duct installation;
- Ponds within 250 m of the proposed works along the A34 were considered outside of the scope of works in 2013; however were included in 2014 due to the proposed reprofiling outside of the highway, including some areas greater than 250 m to establish metapopulations and potential areas for receptor sites;
- Ponds where no access was permitted in 2013 were included in 2014;
- Ponds greater than 250 m to the south of the proposed route within Styal Golf Course were omitted as the 2014 surveys were undertaken to inform the proposed A6 route mitigation requirements and not the accommodation works to Styal Golf Course which was required in 2013. Natural England agreed that enough was known about the population within the southern areas of the golf course to inform the GCN

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licence for this element of the works, however asked that the ponds within 250 m of the proposed A6 route were resurveyed to better inform the mitigation requirements of the A6; and

- Ponds west of the railway between Styal Golf Course and Manchester Airport were included in 2014 as the railway was not considered to be a sufficient barrier to GCN dispersal due to the suitable habitat along each embankment.

A Summary of the 2014 GCN surveys and the HSI scores are given in Table 9 below. Raw data can be found in Appendix A.

Table 9 Summary of 2014 Survey Results

Pond Number	HSI Score	Overall Peak Counts	Eggs Found	2014 Population Size Class	Additional Comments
10	0.57	0	No	Absent	
10a	N/A – ditch not pond	0	No	Absent	Dried up 3 rd visit
12	0.84	0	No	Absent	
18	0.58	2	No	Small	2 juvenile GCN
22	0.50	0	No	Absent	Dry on 3 rd visit
25	0.72	47	Yes	Medium	
25a	0.76	0	No	Absent	Only 2 visits, pond dry but held water during flash floods only so was subject to two surveys, HSI and results based on these
34	0.63	6	Yes	Small	
39	0.47	0	No	Absent	
47	0.52	0	No	Absent/Dried up	Dried out before first visit, held water during a flash flood so was subject to one survey
52	0.67	22	Yes	Medium	
57	0.71	20	Yes	Medium	
58	0.47	0	No	Absent	
60	0.63	14	Yes	Medium	
67	0.73	6	No	Small	
68	0.41	40	Yes	Medium	
72	0.73	0	No	Absent	
78	0.62	10	No	Small	
80	0.56	0	No	Absent	
81	0.69	4	Yes	Small	
83	0.70	0	No	Absent	
84	0.62	0	No	Absent	
85	0.76	1	No	Small	Dry on 6 th visit
86	0.60	0	No	Absent	
87	0.62	0	No	Absent	
89	0.68	0	No	Absent	
90	0.66	5	Yes	Small	
91	0.44	0	No	Absent	
91a	0.40	0	No	Absent	
92	0.58	0	No	Absent	
93	0.68	1	Yes	Small	
95	0.41	0	No	Absent	
98	0.74	2	No	Small	
100	0.73	0	No	Absent	
101	0.43	1	No	Small	
103	0.70	6	No	Small	
104	0.75	0	No	Absent	
105	0.84	33	Yes	Medium	
106	0.51	0	No	Absent	
107	0.72	0	No	Absent	
108	0.84	7	No	Small	

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Pond Number	HSI Score	Overall Peak Counts	Eggs Found	2014 Population Size Class	Additional Comments
108a	0.51	0	No	Absent	
108b	0.35	2	No	Small/Dry	Pond dry but held water during flash floods only so was subject to surveys when possible, HSI and results based on these
109	0.90	0	No	Absent/Dry	Dried after 1 st visit
110	0.56	0	No	Absent	
111	0.82	12	Yes	Medium	
112	0.70	0	No	Absent	
113	0.66	0	No	Absent	
116	0.26	0	No	Absent	Surveyed as only pond in that section holding water
118	0.64	0	No	Absent	
119	0.87	0	No	Absent	
122	0.78	0	No	Absent	
124	0.78	0	No	Absent	
125	0.59	0	No	Absent	
127	0.60	0	No	Absent	
130	0.83	0	No	Absent	
131	0.58	0	No	Absent	
131a	0.81	0	No	Absent	Dry on 4 th visit
133	0.75	0	No	Absent	
134	0.47	0	No	Absent	
135	0.66	0	No	Absent	
136	0.27	0	No	Absent	High density of sticklebacks
139	0.27	0	No	Absent	High density of sticklebacks
140	0.80	0	No	Absent	
141	0.26	0	No	Absent	Major impact by Canada geese
147	0.59	0	No	Absent	Smooth newt eggs
148	0.67	0	No	Absent	
149	0.53	0	Yes	Eggs only	GCN eggs
150	0.74	0	No	Absent	Smooth newt eggs
152	0.63	0	No	Absent	Smooth newt eggs
153	0.56	0	No	Absent	Smooth newt eggs
157	0.66	3	Yes	Small	
161	0.64	0	No	Absent	
162	0.62	0	No	Absent	
163	0.78	1	No	Small	
169	0.75	2	Yes	Small	
174	0.60	0	No	Absent	
176	0.64	16	Yes	Medium	
179	0.57	0	No	Absent	
180	0.65	4	No	Small	
185	0.70	2	Yes	Small	
187	0.54	0	No	Absent	
188	0.47	0	No	Absent	
189	0.76	0	No	Absent	
190	0.68	0	No	Absent	
194	0.69	2	No	Small	
195	0.77	0	No	Absent	
195a	0.71	0	No	Absent	
196	0.60	2	No	Small	
197	0.70	4	No	Small	
198	0.86	4	No	Small	
199	0.89	3	No	Small	
200	0.60	0	No	Absent	
205	0.77	5	No	Small	

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Pond Number	HSI Score	Overall Peak Counts	Eggs Found	2014 Population Size Class	Additional Comments
206	0.57	0	No	Absent	
207	0.62	0	No	Absent	
208	0.73	0	No	Absent	
209	0.59	0	No	Absent	
211	0.38	0	No	Absent	
214	0.66	0	No	Absent	
217	0.81	3	No	Small	
219	0.78	0	No	Absent	Only 1 survey – health and safety issues but lies within a small population area
222	0.79	0	No	Absent	
223	0.66	1	No	Small	
227	0.64	0	No	Absent	
229	0.64	0	No	Absent	
231	0.69	1	No	Small	
232	0.63	0	No	Absent	
233	0.74	11	Yes	Medium	
233a	0.45	1	No	Small	
234	0.74	8	Yes	Small	
235	0.74	39	Yes	Medium	
236	0.49	14	Yes	Medium	
239	0.73	7	Yes	Small	
255	0.44	0	No	Absent	
256	0.64	0	No	Absent	
256a	0.68	12	Yes	Small	
256b	0.67	9	Yes	Small	
258	0.73	1	No	Small	GCN found on last visit at end of season so additional two visits not undertaken; however pond lies greater than 250m from scheme in a already known medium population area.
259	0.79	0	Yes	Eggs only	GCN eggs found. No individuals

Please note that full surveys were conducted on ponds with HSIs lower than 0.5 where they were considered to potentially fall within a meta-population.

Of the 120 ponds (including 1 ditch) surveyed during 2014 by AECOM/Grontmij, the following results were obtained:

- 46 ponds were found to contain populations of GCN or GCN eggs;
- Of the GCN ponds, 33 were found to be of a small population;
- Of the GCN ponds, 11 were found to be of a medium population;
- Of the GCN ponds, 2 were found to contain GCN eggs but no individuals were found during other survey methods;
- Of the confirmed GCN ponds, 24 were found to be breeding ponds;

For the ponds within the Styal Golf Course, the medium populations within each pond found on survey visits were found to comprise a meta-population equivalent to a large population, in particular when these survey results are combined with the 2013 results which covered further ponds in Styal Golf Course further south than the scope of the A6 Route corridor.

The results of the GCN surveys are illustrated on Figures A6MARR-0-M -30-003-FI-158 , Sheet 1 to 8 (See Appendix B).

4.0 CONCLUSIONS AND RECOMMENDATIONS

The GCN survey results indicate that GCN are using ponds in multiple (10) locations along the proposed A6MARR that were surveyed by AECOM/Grontmij in 2014, implying that there are 10 meta-populations. The full mitigation strategy for GCN in relation to the proposed scheme can be found within the AECOM/Grontmij 2014 GCN Natural England Development Licence document.

4.1 Recommendations

As part of the A6MARR scheme there are a number of GCN populations along the route, for which mitigation, under a Natural England GCN mitigation licence, is required prior to commencement of works within 250 m of the known breeding ponds.

There are a number of distinct areas along the route where GCN is present and mitigation required as detailed below, from East to West, including some previously unidentified areas of GCN populations:

- Area 1 – Hazel Grove - Medium Population;
- Area 2 – West of Macclesfield Road – new - Small Population;
- Area 3 – South of Mill Hill Hollow - Small Population;
- Area 4 – Hill Green Farm - Small Population;
- Area 5 - Woodford Road (Part of Phase 2 in the GCN Masterplan) - Medium Population;
- Area 6 – Bramhall Oil Terminal (Part of Phase 2 in the GCB Masterplan) - Medium Population (due to previous results);
- Area 7 – A34 – new - Medium Population;
- Area 8 - West of B5368 Meta- Population - Small Population;
- Area 9 - Styal Golf Course – now extended to the east and west (across the railway) - Large Population; and
- Area 10 – Moss Nook – new - Small Population.

A strategy has been outlined for each of the above areas and the recommendations are in accordance with the Design Manual for Roads and Bridges (DMRB) Volume 10: Environmental Design and Management, Section 4: The Good Roads Guide – Nature Conservation, Part 6: HA 98/01 Nature Conservation Management Advice in Relation to Amphibians (hereafter referred to as DMRB Volume 10 Section 4 Part 6 HA 98/01), Froglife (2001) Great Crested Newt Conservation Handbook and English Nature (2001) Great Crested Newt Mitigation Guidelines.

This strategy has been incorporated into the GCN Licence for Natural England, which in summary includes the exclusion and translocation of GCN from the route corridor, creation of new terrestrial habitat within specific Habitat Creation Areas, as well as along road verges. 26 new ponds will be created which will be specifically designed for GCN. Amphibian tunnels will be installed to reduce habitat severance with permanent fencing to restrict GCN access to the road. Post construction monitoring will be undertaken and advise on any site specific management measures (where/if required).

The strategy has incorporated the following general points.

4.1.1 Construction of New GCN Ponds and Terrestrial Habitat

New ponds will be constructed to compensate for those lost of existing ponds; the design of these ponds has taken into account the following characteristics:

- Surface area between 100 and 300 meters squared (m²) ;
- Depth, varying water levels to a depth of 2.5 m;
- The ponds will be designed to hold water throughout at least one summer in every 3 years;
- The ponds will be planted to provide cover of submerged and marginal vegetation;
- Open areas will be retained to facilitate courtship behaviour;
- Ponds will be provided in clusters, rather than in isolation; and
- Ponds will be positioned to avoid shading on the south side.

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Other features that have been incorporated include:

- Shallow slopes at the edge of the pond; and
- Hummocks and hollows in the drawdown zone to maximise the hydrological diversity of this area.

In summary the ponds will incorporate a range of depths and profiles, and a mix of emergent marginal and submerged aquatic vegetation, in order to provide diverse habitat structures with different features suitable for use by breeding GCN and the different life-stages of GCN.

Where planting is required, where practical aquatic plants will be sourced from nearby ponds, ideally those to be lost, taking care not to transfer fish or invasive aquatic plant species such as New Zealand pygmyweed *Crassula helmsii*, water fern *Azolla filiculoides*, least duckweed *Lemna minuta* and floating pennywort *Hydrocotyle ranunculoides*.

Where plants need to be purchased they will be bought from a local supplier and be of local provenance. In order to facilitate the aquatic plant assemblage, pre-planted coir rolls may be suitable.

The plant species will include species from the list provided in Table 10 below.

Table 10 Suggested Aquatic Plant Species

Common Name	Scientific Name
Ragged-robin	<i>Lychnis flos-cuculi</i>
Soft rush	<i>Juncus effusus</i>
Cuckooflower	<i>Cardamine pratensis</i>
Meadowsweet	<i>Filipendula ulmaria</i>
Marsh-marigold	<i>Caltha palustris</i>
Marsh cinquefoil	<i>Potentilla palustris</i>
Yellow iris	<i>Iris pseudacorus</i>
Purple-loosestrife	<i>Lythrum salicaria</i>
Brooklime	<i>Veronica beccabunga</i>
Water-plantain	<i>Alisma plantago-aquatica</i>
Water mint	<i>Mentha aquatica</i>
Water forget-me-not	<i>Myosotis scorpioides</i>
Duckweed	<i>Lemna minor</i>
Mare's-tail	<i>Hippuris vulgaris</i>
Greater spearwort	<i>Ranunculus lingua</i>
Arrowhead	<i>Sagittaria sagittifolia</i>
Fennel pondweed	<i>Potamogeton pectinatus</i>
Frogbit	<i>Hydrocharis morsus-ranae</i>
Amphibious bistort	<i>Polygonum amphibium</i>
Water-crowfoot	<i>Ranunculus aquatilis</i>
Spiked water-milfoil	<i>Myriophyllum spicatum</i>
Common water-starwort	<i>Callitriche stagnalis</i>
Common hornwort	<i>Ceratophyllum demersum</i>
White water-lily	<i>Nymphaea alba</i>
Willow moss	<i>Fontinalis antipyretica</i>

The strategy includes four different pond designs, as detailed below:

1. 300 sq m - length 30 m, width 10 m with a max depth of 2.5 m;
2. 250 sq m - length 25 m, width 10 m with a max depth of 2 m;
3. 150 sq m - length 15 m, width 10 m and max depth of 1.5 m; and
4. 100 sq m - length 10 m, width 10 m and depth 1.5 m.

The new ponds will be sited within 250 m of the breeding ponds to be lost and also within 250 m of other breeding ponds. Hibernacula and log piles will be provided within the vicinity of the new ponds to provide hibernation and

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resting sites close to the ponds. The areas around the ponds will be landscaped with the aim of providing species rich grassland, scrub and scattered trees.

Amphibian underpasses will also be provided at a number of locations along the route to minimise habitat severance.

Through detailed design it has been possible to reduce the number of GCN breeding ponds to be lost, despite the increase in the number of GCN ponds being found in 2014. In total 6 breeding ponds will be destroyed/damaged and 5 non-breeding ponds will be lost. As such a total of 26 ponds will be provided based on 2:1 replacement and also to ensure an increase in the area of water along the route corridor.

4.1.2 Capture and Exclusion

Suitable terrestrial habitat within the works corridor, and within 250 m of ponds (English Nature, 2001) known to support GCNs will be subjected to a programme of capture and exclusion to remove animals. This will be carried out under a Natural England European Protected Species (EPS) development licence and before construction begins, but during the active season for great crested newt (February-October).

Great crested newts can be guided into pitfall traps (see below) by the use of drift fencing. Likewise, they can be prevented from (re-)entering an area using exclusion fencing. The exclusion fencing should be as 'newt-proof' as reasonably possible over the entire period of works.

Locations

There were previously 5 areas along the route corridor where mitigation for GCN was required. This has now increased to 10 areas following the updated 2014 surveys, and therefore must be subject to a Natural England European protected Species Licence. All works within 250 m must be cleared of GCN prior to any works that will affect their habitat, either aquatic or terrestrial. This will involve the installation of GCN mitigation fencing around all areas of proposed works including enabling works, site clearance including top soil strip, site compound areas and access routes to the works unless utilising existing roads.

Specification

Permanent Newt Fencing - Some areas of Permanent fencing will be required to prevent GCN from crossing the road near to receptor sites and other known GCN populations, as well as to guide newts to underpasses. This fencing will be as outlined in the Great Crested Newt Mitigation Guidelines (English Nature 2001). Permanent newt fencing must be heavy duty, robust and durable and last for several decades. It should also ideally be one way to allow any newts which have managed to access the road verge, to climb the fence and access adjacent areas.

Temporary Newt Fencing - All areas within 250 m of GCN ponds will be surrounded by perimeter upright or one-way GCN fencing and drift fencing will be installed to compartmentalise larger areas in order to trap GCN more intensively, and will be removed once trapping is complete, and prior to the start of works.

The perimeter fencing will remain for the duration of the works and be maintained intact and in good condition throughout, or risk having to re-trap out an area with works ceasing until this has been completed.

Fencing Design

The fencing design will be in accordance with the recommendations in the English Nature Newt Mitigation Guidelines (2001) and will be installed taking account of the following:

- The proposed fence-line will first be searched and cleared of amphibians if it is likely that they are present.
- The fence will be installed to the correct height and depth and with an adequate 'under-lap' to prevent newts from passing underneath.
- The backfill will be placed turf downwards in the trench (to suppress re-growth of grass) and well compacted to eliminate any lumps or gaps that animals can climb into as this will make the exclusion period more difficult and lengthy as it provides alternative locations to hide.
- An overhang or 'top curl' will be provided in the exclusion fencing.
- Fence posts will be positioned on the inside (working area) of the perimeter, on the outside of any receptor area fence, and in the case of drift fencing, on the side of the fence that is least likely to encounter newts.
- A record of fence inspection and damage repair work will be kept by the licence holder as evidence that the newt-proof barrier has been properly maintained.

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Pitfall Traps and Carpet Tiles

Alternate Pit fall traps and carpet tiles will be placed at regular intervals along the fencing. Standard guidelines specify that these should be placed at 5 to 10 m intervals, sometimes more closely spaced where intensive trapping is required such as around ponds. These must be placed on both sides of the drift fencing and on the inside of the perimeter fencing, with the exception of some areas that may require traps on both sides of the perimeter fencing in order to capture GCN on migration.

The density of pitfall traps and number of days trapping is guided by the size of the GCN population present within the area that is being trapped out, as detailed below (further information is provided in the GCN Natural England European Protected Species Licence):

- Small population – minimum pitfall trap density of 50 per hectare (ha) (carpet tiles are additional to this). Area trapped for a minimum of 30 days.
- Medium population – minimum pitfall trap density of 80 per ha (carpet tiles are additional to this). Area trapped for a minimum of 60 days.
- Large population – minimum pitfall trap density of 100 per ha (carpet tiles are additional to this). Area trapped for a minimum of 90 days.

The following points will be taken into consideration when installing the pitfall traps:

- Pitfall traps will be fitted flush to the barrier fence, with their tops just below ground level. Frequent checks will be made to ensure that the traps have not pulled away from the fence or their tops raised above the ground, especially after periods of heavy rainfall or dry weather. In very wet periods, especially in clay areas where the water table can rise rapidly, the 'empty' buckets are likely to pop out (and therefore become ineffective) unless some form of pegging-down is used. If remedial works are required the bucket-hole and backfill should be carefully searched for newts prior to the trap being re-seated. Drilling holes in traps may improve drainage on free-draining soils.
- Spacing of the pitfalls should generally be between 5 and 10 m, though higher densities may result in higher capture rates and may be appropriate around key areas (e.g. breeding ponds, rubble piles).
- To increase the chances of capture, suitable refuges (e.g. carpet tiles) will also be placed along the fence line at a similar density to the pitfall traps and will be fitted flush up to the fence.
- Pitfall traps will be checked daily before 11 am, as outlined in the English Nature Newt Mitigation Guidelines (2001).

5.0 REFERENCES

Design Manual for Roads and Bridges (DMRB) Volume 10: Environmental Design and Management, Section 4: The Good Roads Guide – Nature Conservation, Part 6: HA 98/01 Nature Conservation Management Advice in Relation to Amphibians

English Nature (2001) Great Crested Newt Mitigation Guidelines.

Froglife (2001) Great Crested Newt Conservation Handbook;

Mouchel (2013) A6 to Manchester Airport Relief Road Environmental Statement

Mouchel (2013) Styal Golf Course Great Crested Newt *Triturus cristatus* Report

Mouchel (2013) A6 Marr GCN Licence Phased Masterplan Draft English Nature (2001) Great Crested Newt Mitigation Guidelines.

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

Websites

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

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

APPENDIX A RAW DATA

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
1	381693	385844	1350	-	Outside scope	-	-	-		
2	381894	386231	1348	-	Outside scope	-	-	-		
3	381900	385679	1107	-	Outside scope	-	-	-		
4	382071	385773	970	-	Outside scope	-	-	-		
5	382135	385922	976	-	Outside scope	-	-	-		
6	382146	385665	865	-	Outside scope	-	-	-		
7	382174	385813	891	-	Outside scope	-	-	-		
8	382245	385714	786	-	Outside scope	-	-	-		
9	383170	385085	244	-	Does not exist	-	-	-		
10	383330	384809	453	0.57	Yes	Absent	0	No		
11	383456	385020	209	-	Does not exist	-	-	-		
12	383461	384493	404	0.84	Yes	Absent	0	No		
13	383536	384135	477	-	Outside scope	-	-	-		
14	383548	384104	492	-	Outside scope	-	-	-		
15	383585	385096	86	-	Does not exist	-	-	-		
16	383666	383653	849	-	Outside scope	-	-	-		
17	383682	385033	101	-	Does not exist	-	-	-		
18	383689	385161	0	0.58	Yes	Small	2	No		Absent
19	383732	384966	118	-	Does not exist	-	-	-		
20	383736	385134	0	-	Dry	-	-	-		
21	383756	384024	467	-	Outside scope	-	-	-		
22	383756	385257	41	0.5	Yes	Absent	0	No		
23	383794	383265	1215	-	Outside scope	-	-	-		

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
24	383805	383778	702	-	Outside scope	-	-	-		
25	383896	384525	17	0.72	Yes	Medium	47	Yes		
26	383914	383683	796	-	Outside scope	-	-	-		
27	383921	383820	660	-	Outside scope	-	-	-		
28	384017	384151	359	-	Outside scope	-	-	-		
29	384098	383891	630	-	Outside scope	-	-	-	Small, eggs	
30	384098	383839	679	-	Outside scope	-	-	-	Small, eggs	
31	384157	383683	842	-	Outside scope	-	-	-	Small, eggs	
32	384160	383006	1404	-	Outside scope	-	-	-		
33	384171	384532	75	-	Dry	-	-	-		
34	384172	384831	0	0.63	Yes	Small	6	Yes	Absent	
35	384175	384269	321	-	Outside scope	-	-	-		
36	384178	384109	475	-	Outside scope	-	-	-		
37	384181	384406	185	-	Does not exist	-	-	-		
38	384194	384819	0	-	Does not exist	-	-	-		
39	384196	384433	156	0.47	Yes	Absent	0	No	Absent	
40	384214	383787	729	-	Outside scope	-	-	-	Small, yes	
41	384217	384418	168	-	Does not exist	-	-	-		
42	384249	383988	551	-	Outside scope	-	-	-	Small, yes	
43	384254	383464	955	-	Outside scope	-	-	-		
44	384254	384124	426	-	Outside scope	-	-	-	Small	Medium, eggs
45	384266	385653	467	-	Outside scope	-	-	-		
46	384273	385364	245	-	Outside scope	-	-	-		
47	384289	384524	62	0.52	Yes/Dried up	Absent/Dried-up	-	-		

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
48	384294	383634	791	-	Outside scope	-	-	-	Small, eggs	
49	384297	383780	675	-	Outside scope	-	-	-	Absent	
50	384309	383280	1093	-	Outside scope	-	-	-		
51	384320	384848	64	-	Does not exist	-	-	-		
52	384324	384426	127	0.67	Yes	Medium	22	Yes	Medium, eggs	
53	384330	383027	1321	-	Outside scope	-	-	-		
54	384351	384819	66	-	Does not exist	-	-	-		
55	384354	384037	462	-	Outside scope	-	-	-	Absent	Small
56	384391	384857	121	-	Does not exist	-	-	-		
57	384409	384348	157	0.71	Yes	Medium	20	Yes	Medium, eggs	Medium
58	384420	384456	55	0.47	Yes	Absent	0	No	Absent	
59	384422	383863	531	-	Outside scope	-	-	-	Absent	
60	384457	384346	139	0.63	Yes	Medium	14	Yes	Small	Small
61	384462	384641	56	-	Dry	-	-	-		
62	384467	383792	564	-	Outside scope	-	-	-	Small, eggs	
63	384467	384689	98	-	Dry	-	-	-		
64	384467	384667	80	-	Dry	-	-	-		
65	384493	384139	290	-	Outside scope	-	-	-	Small	Medium
66	384507	384085	311	-	Outside scope	-	-	-	Absent	Small
67	384526	384470	0	0.73	Yes	Small	6	No	Absent	Small
68	384550	384439	17	0.41	Yes	Medium	40	Yes	Medium, eggs	Medium, eggs
69	384575	383603	699	-	Outside scope	-	-	-	Medium	
70	384580	383499	799	-	Outside scope	-	-	-		
71	384601	383247	1041	-	Outside scope	-	-	-		
72	384609	384209	154	0.73	Yes	Absent	0	No	Absent	

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
73	384617	383996	313	-	Outside scope	-	-	-	Absent	Medium
74	384630	384220	131	-	Does not exist	-	-	-		
75	384632	383580	709	-	Outside scope	-	-	-		
76	384686	383754	527	-	Outside scope	-	-	-		
77	384691	383934	350	-	Outside scope	-	-	-		
78	384700	384400	0	0.62	Yes	Small	10	No	Absent	Small
79	384731	384011	267	-	Outside scope	-	-	-	Absent	Small
80	384789	384398	0	0.56	Yes	Absent	0	No	Absent	
81	384815	384137	138	0.69	Yes	Small	4	Yes	Small	Small
82	384832	383504	770	-	Outside scope	-	-	-		
83	384876	384322	15	0.7	Yes	Absent	0	No	Absent	
84	384952	384389	0	0.62	Yes	Absent	0	No		
85	385009	384293	17	0.76	Yes	Small	1	No		
86	385016	384546	86	0.6	Yes	Absent	0	No		
87	385074	384242	79	0.62	Yes	Absent	0	No	Absent	
88	385176	384757	295	-	Unsuitable	-	-	-		
89	385207	384246	123	0.68	Yes	Absent	0	No	Absent	
90	385252	384583	131	0.66	Yes	Small	5	Yes	Absent	Absent
91	385367	384418	0	0.44	Yes	Absent	0	No	Absent	
92	385307	384794	273	0.58	Yes	Absent	0	No		
93	385391	384754	188	0.68	Yes	Small	1	Yes		Absent
94	385391	384707	152	-	Unsuitable	-	-	-	Absent	
95	385602	384620	87	0.41	Yes	Absent	0	No		
96	386121	384925	356	-	Dry	-	-	-		
97	386140	384750	180	-	Dry	-	-	-		

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
98	386240	384934	363	0.74	Yes	Small	2	No		
99	386196	384407	115	-	Dry	-	-	-		
100	386195	384867	296	0.73	Yes	Absent	0	No		
101	386213	385073	478	0.43	Yes	Small	1	No	Absent	
102	386378	385008	310	-	Dry	-	-	-		
103	386676	384789	55	0.7	Yes	Small	6	No	Absent	
104	386717	383631	279	0.75	Yes	Absent	0	No		
105	386732	384899	23	0.84	Yes	Medium	33	Yes	Small	
106	386737	383698	215	0.51	Yes	Absent	0	No		
107	386742	383876	51	0.72	Yes	Absent	0	No		
108	386745	384775	24	0.84	Yes	Small	7	No	Small	
109	386746	383570	343	0.9	Yes/Dried up	Absent/Dried-up	-	-		Absent
110	386757	385022	11	0.56	Yes	Absent	0	No		Absent
111	386768	384804	9	0.82	Yes	Medium	12	Yes	Small	
112	386774	383607	311	0.7	Yes	Absent	0	No		
113	386781	383730	196	0.66	Yes	Absent	0	No		
114	386976	384327	35	-	Dry	-	-	-		
115	386981	384600	86	-	Dry	-	-	-		
116	387135	384350	121	0.26	Yes	Absent	0	No		
117	387139	384518	252	-	Dry	-	-	-		
118	387306	383883	149	0.64	Yes	Absent	0	No		
119	387320	383815	205	0.87	Yes	Absent	0	No		
120	387544	383446	464	-	Outside scope	-	-	-		
121	387572	384000	24	-	Dry	-	-	-		Absent

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
122	387615	383794	121	0.78	Yes	Absent	0	No		
123	387743	383396	461	-	Outside scope	-	-	-		
124	387772	383569	286	0.78	Yes	Absent	0	No		
125	387856	383635	205	0.59	Yes	Absent	0	No		
126	387961	383291	538	-	Outside scope	-	-	-		
127	388021	383805	24	0.6	Yes	Absent	0	No		
128	388069	383398	427	-	Outside scope	-	-	-		
129	388071	383680	145	-	Does not exist	-	-	-		
130	388072	383500	325	0.83	Yes	Absent	0	No		
131	388139	383581	256	0.58	Yes	Absent	0	No		
132	388172	383389	450	-	Outside scope	-	-	-		
133	388231	383761	80	0.75	Yes	Absent	0	No		Absent
134	388285	383433	388	0.47	Yes	Absent	0	No		
135	388293	383672	156	0.66	Yes	Absent	0	No		Absent
136	388294	384085	189	0.27	Yes	Absent	0	No		
137	388425	383253	511	-	Outside scope	-	-	-		
138	388428	383543	237	-	Unsuitable	-	-	-		
139	388459	384013	160	0.27	Yes	Absent	0	No		
140	388519	383370	367	0.8	Yes	Absent	0	No		Absent
141	388672	383844	70	0.26	Yes	Absent	0	No		
142	388693	383304	375	-	Outside scope	-	-	-		
143	388723	383883	98	-	Does not exist	-	-	-		
144	388854	383185	437	-	Outside scope	-	-	-		Absent
145	389147	383197	405	-	Outside scope	-	-	-		
146	389243	383146	429	-	Outside scope	-	-	-		

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Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
147	389441	383598	26	0.59	Yes	Absent	0	No	Absent	
148	389452	383559	65	0.67	Yes	Absent	0	No	Absent	
149	389643	383459	170	0.53	Yes	GCN-eggs	GCN-eggs	GCN-eggs	Absent	Absent
150	389662	383227	371	0.74	Yes	Absent	0	No		
151	389715	383669	0	-	Does not exist	-	-	-		Absent
152	389754	383324	255	0.63	Yes	Absent	0	No	Absent	
153	389811	383579	0	0.56	Yes	Absent	0	No		
154	389849	383780	0	-	Dry	-	-	-		
155	389872	383000	495	-	Outside scope	-	-	-		
156	389917	383533	18	-	Dry	-	-	-		
157	389919	383706	0	0.66	Yes	Small	3	Yes	Small	Absent
158	389941	382891	586	-	Outside scope	-	-	-		
159	389943	383069	410	-	Outside scope	-	-	-	Absent	Absent
160	389954	383206	274	-	Outside scope	-	-	-	Absent	Absent
161	390050	384083	42	0.64	Yes	Absent	0	No		
162	390052	384126	66	0.62	Yes	Absent	0	No		
163	390074	384019	29	0.78	Yes	Small	1	No		
164	390105	382983	494	-	Outside scope	-	-	-		
165	390114	384213	167	-	Outside scope	-	-	-		
166	390124	383224	265	-	Outside scope	-	-	-	Absent	
167	390143	383159	333	-	Outside scope	-	-	-	Absent	Absent
168	390178	383074	425	-	Outside scope	-	-	-	Absent	Absent
169	390181	383854	13	0.75	Yes	Small	2	Yes		
170	390201	383194	328	-	Outside scope	-	-	-		
171	390204	383191	332	-	Outside scope	-	-	-	Absent	

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Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
172	390231	383294	271	-	Outside scope	-	-	-	Absent	Absent
173	390235	383006	510	-	Outside scope	-	-	-		
174	390248	384424	235	0.6	Yes	Absent	0	No	Absent	
175	390278	383306	300	-	Outside scope	-	-	-	Absent	Absent
176	390343	384378	130	0.64	Yes	Medium	16	Yes	Small, eggs	
177	390355	384049	0	-	Does not exist	-	-	-		
178	390505	384815	360	-	Does not exist	-	-	-		
179	390531	384912	457	0.57	Yes	Absent	0	No		
180	390541	384461	8	0.65	Yes	Small	4	No	Small	
181	390548	384666	213	-	Does not exist	-	-	-		
182	390589	384619	169	-	Does not exist	-	-	-		Small
183	390596	384664	214	-	Does not exist	-	-	-		
184	390603	384708	258	-	Does not exist	-	-	-		
185	390644	384228	0	0.7	Yes	Small	2	Yes	Absent	
186	390665	384227	0	-	Does not exist	-	-	-		
187	390731	384483	95	0.54	Yes	Absent	0	No		
188	390731	384511	123	0.47	Yes	Absent	0	No	Absent	
189	390756	384491	100	0.76	Yes	Absent	0	No	Absent	
190	390763	384107	125	0.68	Yes	Absent	0	No	Absent	Absent
191	390793	384919	399	-	Does not exist	-	-	-		
192	390817	384992	454	-	Does not exist	-	-	-		
193	390888	384508	12	-	Does not exist	-	-	-		
194	390959	383948	349	0.69	Yes	Small	2	No	Absent	Absent
195	390969	384107	233	0.77	Yes	Absent	0	No	Absent	
196	391000	384227	138	0.6	Yes	Small	2	No	Absent	Absent

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
197	391022	383965	375	0.7	Yes	Small	4	No	Absent	Small
198	391067	384083	293	0.86	Yes	Small	4	No	Absent	Small
199	391104	384133	253	0.89	Yes	Small	3	No		
200	391105	383839	524	0.6	Yes	Absent	0	No		
201	391108	385044	304	-	Outside scope	-	-	-	Absent	
202	391114	384546	59	-	Does not exist	-	-	-		
203	391156	384156	245	-	Dry	-	-	-		Small
204	391178	384273	141	-	Does not exist	-	-	-		
205	391189	384260	157	0.77	Yes	Small	5	No	Small	Small
206	391241	384402	32	0.57	Yes	Absent	0	No	Absent	Small, eggs
207	391243	384794	23	0.62	Yes	Absent	0	No		
208	391383	384486	0	0.73	Yes	Absent	0	No	Absent	Absent
209	391406	384875	149	0.59	Yes	Absent	0	No		
210	391423	384473	32	-	Does not exist	-	-	-		
211	391424	384832	146	0.38	Yes	Absent	0	No		
212	391465	385111	267	-	Dry	-	-	-		
213	391500	384800	125	-	Dry	-	-	-		
214	391597	385016	113	0.66	Yes	Absent	0	No	Absent	
215	391627	384978	85	-	Dry	-	-	-		
216	391696	385646	475	-	Outside scope	-	-	-	Absent	
217	391722	384733	9	0.81	Yes	Small	3	No	Absent	Small
218	391794	384560	158	-	Does not exist	-	-	-		
219	391825	384589	177	0.78	Yes	Absent	0	No	Absent	
220	391964	384666	234	-	Does not exist	-	-	-		
221	391966	384701	215	-	Does not exist	-	-	-		

Great Crested Newt Surveys

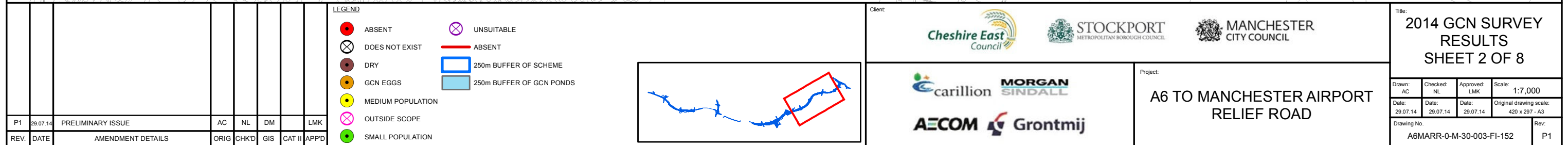
Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
222	392202	385427	48	0.79	Yes	Absent	0	No	Absent	Absent
223	392252	385438	41	0.66	Yes	Small	1	No	Absent	
224	392339	384735	499	-	Outside scope	-	-	-		
225	392352	385450	28	-	Dry	-	-	-		
226	392419	384784	435	-	Outside scope	-	-	-		
227	392548	385135	109	0.64	Yes	Absent	0	No		
228	392604	384786	449	-	Outside scope	-	-	-		
229	392965	385202	141	0.64	Yes	Absent	0	No		
230	393015	385010	334	-	Outside scope	-	-	-		
231	393413	385984	0	0.69	Yes	Small	1	No	Absent	
232	393531	386084	32	0.63	Yes	Absent	0	No		
233	393611	386159	138	0.74	Yes	Medium	11	Yes	Small	Medium
234	393587	385978	54	0.74	Yes	Small	8	Yes	Small	Medium
235	393701	386123	203	0.74	Yes	Medium	39	Yes	Small	Small
236	393725	386006	135	0.49	Yes	Medium	14	Yes	Small, eggs	Small
237	393840	385823	61	-	Unsuitable	-	-	-		
238	393981	386300	516	-	Outside scope	-	-	-	Medium, eggs	
239	394092	385896	256	0.73	Yes	Small	7	Yes		
240	394297	385586	208	-	Outside scope	-	-	-	Absent	Small
241	394439	385308	468	-	Outside scope	-	-	-	Small, eggs	
255	386140	385099	528	0.44	Yes	Absent	0	No		
256	386237	385105	460	0.64	Yes	Absent	0	No		
257	386506	385049	185	-	Dry	-	-	-		
258	390490	384752	298	0.73	Yes	Small	1	No		
259	389783	383809	0	0.79	Yes	GCN-eggs	GCN-eggs	GCN-eggs	Medium	

Great Crested Newt Surveys

Pond Number	X	Y	Distance from Pond to Scheme Boundary (m)	HSI	Subject to 2014 Survey	Population-Size-Class	Peak-Count	Eggs-Found	Previous Survey Results from 2013	Previous Survey Results from 2010
260	384687	385013	427	-	Does not exist	-	-	-	Absent	
108a	386720	384786	38	0.51	Yes	Absent	0	No		
108b	386727	384806	46	0.35	Yes	Small	2	No		
10a				N/A – ditch not pond	Yes	Absent	0	No		
12a	383563	384501	303	-	Unsuitable	-	-	-		
131a	388169	383526	318	0.81	Yes	Absent	0	No		
195a	390893	384139	158	0.71	Yes	Absent	0	No		
201a	391112	385035	294	-	Outside scope	-	-	-		
231a	393376	386094	9	-	Dry	-	-	-		
233a	393588	386148	113	0.45	Yes	Small	1	No		
256a	386316	385098	381	0.68	Yes	Small	12	Yes		
256b	386327	385117	374	0.67	Yes	Small	9	Yes		
259a	389701	383883	28	-	Dry	-	-	-		
25a	383998	384647	29	0.76	Yes	Absent	0	No		
91a	385348	384274	79	0.4	Yes	Absent	0	No		
98a	386198	384830	259	-	Does not exist	-	-	-		

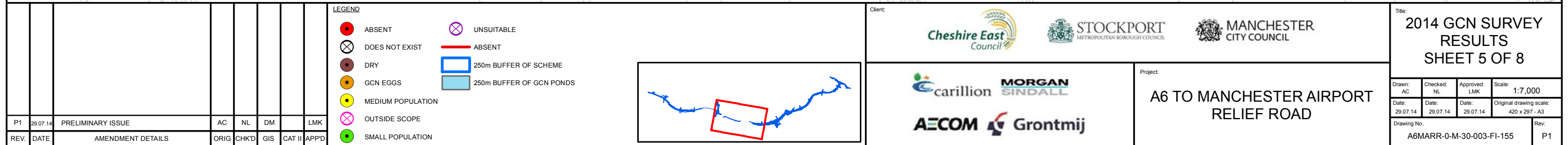
APPENDIX B FIGURES

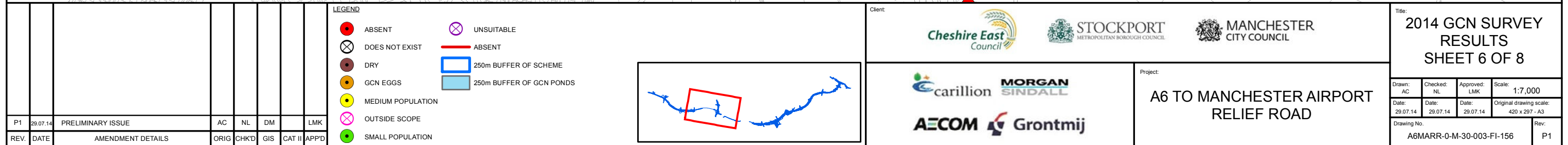
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