A303 Amesbury to Berwick Down

TR010025

6.3 Environmental Statement Appendices

Appendix 8.13 Amphibian survey report

Volume 6

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

October 2018

A303 Stonehenge

Amesbury to Berwick Down

Amphibian Survey Report 2016 - 2017

Arup Atkins Joint Venture

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Foreword

The A303/A358 corridor is a vital connection between the South West and London and the South East. While the majority of the road has been dualled, there are still over 35 miles of single carriageway. These sections act as bottlenecks for users of the route resulting in congestion, particularly in the summer months and at weekends, delays to traffic travelling between the M3 and the South West and an increased risk of accidents. The A303 passes through the Stonehenge, Avebury and Associated Sites World Heritage Site, separating the stones from other scheduled monuments and severely limiting the enjoyment of the wider site.

The A303 Stonehenge (Amesbury to Berwick Down) Scheme is part of the wider package of proposals for the A303/A358 corridor designed to transform the connectivity to and from the South West by creating an expressway. This would comprise of consistently good dual carriageway roads with grade-separated junctions, giving most users a motorway-quality journey. The A303/A358 package was identified in the 2014 National Infrastructure Plan as one of the country's Top 40 priority infrastructure projects.

The proposals by Highways England to upgrade the A303 past Stonehenge consist of an eight mile (13 kilometre) stretch from Amesbury in the east, through the Stonehenge World Heritage Site (WHS) and the village of Winterbourne Stoke, to Berwick Down in the west. Proposals include a 1.8 mile (2.9 kilometre) tunnel with approach roads inside the WHS, a new bypass for Winterbourne Stoke (passing either north or south of the village) and improvements to existing junctions with the A345 and A360.

Highways England (HE) commissioned the Arup-Atkins Joint Venture (AAJV) to undertake the Options Phase for the scheme starting in January 2016. The AAJV was also commissioned by HE to undertake amphibian surveys along these proposed route options in order to de-risk the next stages of the project, due to the fast-tracked nature of the scheme. This report presents the findings of the amphibian surveys. The AAJV would like to thank all the landowners for their considerable help and consideration during the course of the surveys.

Executive Summary

The AAJV were commissioned by Highways England in 2016 to undertake amphibian surveys as part of a programme of ecological surveys to inform the design of the proposed The A303 Stonehenge (Amesbury to Berwick Down) Scheme.

This report presents the baseline survey results recorded during the 2016/2017 amphibian surveys across each of the three route options proposed at the time. It is intended that the information in this report will be used to identify and assess the potential implications of the scheme and inform mitigation and compensation for the species.

A framework of European and national legislation, and planning policy guidance exists to protect and conserve amphibian species.

In 2016, 13 waterbodies were identified within 575 metres of the proposed route options. Of these, five were assessed using the Habitat Suitability Index assessment[1][2] as suitable to support great crested newts and/or tested positive during eDNA testing, and were therefore surveyed further. The 2017 presence/likely absence surveys identified one waterbody supporting a population of great crested newts. Great crested newts were found to be likely absent from the four other waterbodies surveyed, although these waterbodies did support populations of other amphibians including common toad and common frog.

This survey fulfilled its objectives in identifying and surveying the waterbodies with potential suitability to support great crested newts, and identifying a waterbody that supported a great crested newt population. A complete assessment of potential impacts to amphibians will be undertaken within the Environmental Impact Assessment (EIA) for the preferred route option, along with details of mitigation and compensation measures as appropriate.

1 Amphibian and Reptile Groups of the United Kingdom, ARG UK Advice Note 5, Great Crested Newt Habitat Suitability Index, May 2010.
2 Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M.(2000) Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus) Herpetological Journal 10 (4), 143-155.

1 Introduction

1.1 Project Background

1.1.1 The A303 Stonehenge (Amesbury to Berwick Down) Scheme forms part of the A303/A30 trunk route, which provides vital east-west connectivity between London and the South West and is also part of the Trans-European Network-Transport (TEN-T). The A303, which runs for approximately 150km from Junction 8 of the M3 near Basingstoke towards Taunton and Exeter, serves not only long distance traffic but also intermediate regional destinations via connecting major north-south route options as well as local small and medium sized settlements along the route.

1.1.2 Recognising the importance of the A303/A358 Corridor and the problems along it, the Government has committed in its Road Investment Strategy (RIS) to create an 'Expressway' to the South West via the A303/A358 route by 2029. The A303 Stonehenge scheme, involving dualling the A303 between Amesbury and Berwick Down, including the construction of a tunnel at least 1.8 miles (2.9 kilometres) long as the road passes Stonehenge, has been prioritised within the first RIS period (2015/16 to 2019/20).

1.1.3 Following public consultation in January 2017, three routes were recommended for detailed assessment during 2017, Route Options 1Na, 1Sa and 1Nd. Figures HE551506-AA-VES-SWI-DR-YE-000009 and HE551506-AA-VES-SWI-DR-YE-000010 in Appendix A show the waterbodies within 575m of these three Route Options.

1.2 Scope of the Document

1.2.1 This report presents the baseline survey results recorded during the 2016/2017 amphibian surveys. It is intended that the information in this report will be used with the results of other ecological surveys to identify and assess the potential implications of the scheme and inform mitigation and compensation for impacts to amphibian species.

1.2.2 This baseline report can be used to accompany any future Development Consent Order (DCO) and associated Environmental Impact Assessment (EIA) for the proposed scheme.

1.3 Survey Objectives

1.3.1 The aim of the amphibian surveys was to ascertain the following:

- Presence/likely absence of great crested newts *Triturus cristatus*;
- Population size-class of great crested newts, if present;
- Distribution of great crested newts, if present;
- Whether a European Protected Species (EPS) licence is likely to be required to ensure legal compliance; and,
- To gain an appreciation of other species of amphibians that may be present.

1.3.2 This report details the methodology used, describes the results, and makes recommendations for the consideration of amphibians within the proposed Scheme.

1.4 Legislation

1.4.1 Great crested newts, having suffered a decline in population throughout Europe in recent decades, are a European Protected Species (EPS), protected under the Conservation of Habitats and Species Regulations 2010 (as amended), known as the Habitats Regulations.

1.4.2 Under the Habitats Regulations, it is an offence to deliberately capture, injure or kill any wild animal of an EPS, deliberately disturb wild animals of any such species, deliberately take or destroy the eggs of such an animal or damage or destroy a breeding site or resting place of such an animal.

1.4.3 Great crested newts receive further protection through inclusion on Schedule 5 of the Wildlife and Countryside Act (WCA) 1981 (as amended) and the Countryside and Rights of Way (CRoW) Act 2000. Under these Acts it is an offence to: intentionally kill, injure or take any protected species; intentionally or recklessly damage, destroy or obstruct access to any structure or place which a protected species uses for shelter or protection; and intentionally or recklessly disturb any protected species while it is occupying a structure or place which it uses for shelter or protection.

1.4.4 Actions which are prohibited by legislation can be made lawful on the approval and granting of a licence from Natural England (NE), subject to conditions.

1.4.5 Other amphibians in the UK receive legal protection and consideration. The palmate newt *Lissotriton helveticus*, smooth newt *Lissotriton vulgaris*, common frog *Rana temporaria* and common toad *Bufo bufo* are all listed on Schedule 5 of the WCA but are only protected with respect to the prohibition of their sale and advertising for sale.

1.4.6 Common toads are also a Section 42 (S42) species of the Natural Environment and Rural Communities (NERC) Act 2006. The list of species on S42 are used to guide decision makers, including local and regional authorities, in implementing their duty under section 40 of the Act, to have regard to the conservation of biodiversity in England.

1.4.7 The reader should refer to the original legislation for the definitive interpretation.

2 Methodology

2.1 Survey Area

2.1.1 The survey area was buffered from the centrelines of the three proposed route options being considered during 2017: Option 1Na, Option 1Sa and Option 1Nd. This included a 500 metre survey buffer plus the 75 metre route corridor, resulting in a survey area of 575 metres from the centrelines.

2.1.2 All waterbodies within 575 metres of the Route Options (1Na, 1Sa and 1Nd) were identified through desk study using ordnance survey mapping, publicly available online aerial imagery and the previous ES[3]. These waterbodies are shown on Figures HE551506-AA-VES-SWI-DR-YE-000009 and HE551506-AA-VES-SWI-DR-YE-000010 in Appendix A.

2.2 Habitat Suitability Index

2.2.1 Waterbodies within 575 metres of the proposed Scheme were assessed for their suitability to support great crested newt using the standard Habitat Suitability Index (HSI)[12] methodology. Due to a lack of land access arrangements, some waterbodies were not subject to a HSI assessment in June 2016, and were instead assessed between February and early April in 2017 once access had been arranged.

2.2.2 Of the 13 waterbodies identified, waterbodies 3, 4, 9, and 11 were assessed in June 2016, waterbody 1 was assessed in February 2017, waterbodies 5, 7, 8, 10, 12, and 13 were assessed in March 2017, and waterbodies 2 and 6 were assessed in early April 2017. Waterbody 7 was not subject to a full HSI assessment, as although present on OS maps, it was confirmed to be absent when visited in March 2017, and was therefore not surveyed further. Exact dates of HSI assessments at each waterbody can be found in Table 1.

Table 1: Dates of HSI Assessments at Each Waterbody

Waterbody Number	Date of HSI Assessment
1	08/02/2017
2	04/04/2017
3	14/06/2016
4	14/06/2016
5	21/03/2017
6	04/04/2017
7	22/03/2017
8	23/03/2017
9	09/06/2016
10	23/03/2017
11	09/06/2016
12	22/03/2017
13	23/03/2017

3 A303 Stonehenge Improvement Environmental Statement Volume 2, Part 3 Nature Conservation and Biodiversity, Part 3c Reptiles, Amphibians and Fish Appendix 1 Amphibians Baseline Survey Results (abridged) Nicholas Pearson Associates (January 2003).

2.2.3 The methodology has been designed to evaluate habitat quality in order to assess which waterbodies provide suitable habitat for great crested newts as breeding ponds. The HSI is a numerical index, which ranges from 0 to 1. It is calculated using ten key habitat criteria and is based on the assumption that habitat quality determines great crested newt presence/absence. Using this standard approach, ponds with higher scores, are considered more likely to support great crested newts compared to those with low scores (see Table 2 below). However, the system is not sufficiently precise to conclude that any particular pond with a high score will support great crested newt, or that any pond with a low score will not do so.

Table 2: Predicted Presence of Great Crested Newts Based Upon HSI Results

HSI	Pond suitability	Predicted occupancy
<0.5	Poor	0.03
0.5-0.59	Below average	0.20
0.6-0.69	Average	0.55
0.7-0.79	Good	0.79
>0.8	Excellent	0.93

2.3 eDNA Sampling

2.3.1 In addition to a HSI assessment, eDNA tests were carried out in June 2016 on three waterbodies that were assessed as 'below average' or above in the 2016 HSI assessment. This eDNA testing followed standard methodology and best practice guidelines[4], with the eDNA samples being tested at ADAS laboratory.

2.4 Presence/Likely Absence Survey and Population Size Class Assessment

2.4.1 Presence/likely absence surveys and subsequent population size class assessments for great crested newt were carried out at waterbodies that were scoped in for survey during the Habitat Suitability Index assessment and eDNA sampling. Further details of this scoping exercise can be found in Appendix D. These presence/likely absence surveys were carried out in accordance with the methodology prescribed within the Great Crested Newt Mitigation Guidelines[5].

2.4.2 In line with the guidance, to determine presence/likely absence, four survey visits were undertaken between mid-March and mid-June 2017 with at least two of these visits being undertaken between mid-April and mid-May 2017. For those waterbodies where great crested newts were found to be present, a population size class assessment was undertaken, which involves a total of six visits (an additional two visits after the presence/absence survey), with at least 3 visits undertaken during mid-April to mid-May 2017. Dates of the survey visits to each waterbody can be found in Table 3.

4 Biggs et al., (2014) Technical Advice Note for Field and Laboratory Sampling of Great Crested Newt eDNA in Analytical and methodological development for improved surveillance of the Great Crested Newt. Defra Project WC1067. Appendix 5. Freshwater Habitats Trust, Oxford.
5 English Nature. (2001) Great Crested Newt Mitigation Guidelines. English Nature.

2.4.3 The weather conditions during the presence/likely absence survey are detailed in Appendix B.

Table 3: Dates of Survey Visits to Each Waterbody.

Date	Waterbody Number				
	3	5	6	8	10
4th/5th April 2017	Visit 1	Visit 1	Visit 1	Visit 1	-
19th/20th April 2017	Visit 2	Visit 2	Visit 2	-	-
3rd/4th May 2017	Visit 3	Visit 3	Visit 3	Visit 2	Visit 1
16th/17th May 2017	Visit 4	Visit 4	Visit 4	Visit 3	Visit 2
6th/7th June 2017	Visit 5	-	-	Visit 4	Visit 3
13th/14th June 2017	Visit 6	-	-	-	Visit 4

2.4.4 During each visit, at least three survey methods were employed where possible, including torch survey, bottle traps, egg search, refuge searches and netting, as described below:

- **Torch Survey:** The banks of each waterbody were walked after dark, using a high powered torch (1 million candle power) to search for newts and other amphibians. Animals observed were identified to species, sex and life stage where possible.
- **Bottle traps:** Bottle traps were placed around the perimeter of the waterbodies at approximately 2 metre intervals (where suitable habitat and health and safety considerations allowed) shortly before dusk and checked the following morning to determine whether amphibians were present or absent. Each trap was made from a 2 litre plastic bottle with the top cut off and inverted, to make a funnel leading into the bottle. Bamboo canes were used to anchor the traps into the waterbody, taking care to ensure that each bottle included an air bubble. Any animals caught were immediately returned to the waterbody after identification.
- **Egg searches:** Submerged and peripheral vegetation was searched for the presence of newt eggs. The eggs are usually folded in the leaves of aquatic plants, dead leaves or overhanging grass leaves. It is necessary to unfold the leaf to identify the egg. The unfolding increases the risk of predation, therefore once an egg is found the use of this technique is ceased. Recommended survey effort for this method is 15 minutes searching per 50 metre of bank. The presence of eggs of other amphibians was also noted, where observed.
- **Refuge searches:** Searches of existing refuges such as logs, wooden planks and debris within the terrestrial habitats immediately surrounding the waterbody was undertaken. Any amphibians found were identified to species, sex and life stage where possible.
- **Netting:** A sturdy dip-net was used to net the shoreline, for an average of fifteen minutes per 50 metres of shoreline. Care was taken not to damage larvae, and to reduce disturbance to the pond.

2.4.5 Table 4.

Table 4: Methods Employed at Each Waterbody During Presence/Likely Absence Survey

Waterbody Number	Visit 1	Visit 2	Visit 3	Visit 4	Visit 5	Visit 6
	Method: Bottle Trapping (B:Number of traps); Torching (T); Netting (N); Egg Searching (E); Refugia Search (R)					
3	B:20; N; E	T; E; R	B:20; T; E; R	B:20; T; E; R	B:38; T; E; R	B:38; T; R
5	B:20; T; E	B:20; E; R	B:20; T; E; R;	B:20; T; E; R;		
6	B:20; T; E	B:20; T; E; R	B:20; T; E; N	B:20; T; E; R;		
8	T; E; R	T; E; R; N	T; E; R;	T; N; E; R;		
10	E; R; N	T; E; R;	T; N; E; R;	T; E; R;		

2.4.6 Surveys were led on each occasion by Arup ecologists holding Natural England (NE) survey licences or their accredited agents permitting survey for this species.

2.4.7 Population size class is established using the maximum adult count per pond per survey visit, either through torching or bottle trapping, as follows:

- 'Small' for maximum counts up to 10;
- 'Medium' for maximum counts between 11 and 100; and
- 'Large' for maximum counts over 100.

2.4.8 To gain an appreciation of the number of individuals definitely present in the pond, when great crested newts were caught in bottle traps or found during a refugia search, photographs were taken of their underside patterns and subsequently compared.

2.5 Survey Limitations

2.5.1 The number of bottle traps used in waterbody 3 was restricted to 20 traps initially due to high water levels and steep banks presenting a health and safety risk to reach areas of most favourable great crested newt habitat. The water level dropped as the survey season progressed and for the last two survey visits out of six, the number of bottle traps was increased to 38 when it was safer to access areas of suitable great crested newt habitat. This has not affected the validity of the presence/likely absence survey as great crested newts were determined to be present in this waterbody. It is not considered to be a significant limitation to the population size class estimate, as this result is a peak count rather than an average across the survey.

2.5.2 Most of the western bank of waterbody 5 was considered too steep to access, with areas along the other banks being inaccessible due to thick tree trunks on the edges of the bank, and dense willow. Therefore the number of bottle traps used in waterbody 5 was restricted to 20 traps in areas of suitable great crested newt habitat. This is not considered to have affected the validity of the presence/likely absence survey as two or three other survey methods were always used in conjunction with bottle trapping (see Table 4)

2.5.3 The southern bank of waterbody 6 was inaccessible apart from via a plank that was considered too risky to cross. Approximately half of the northern bank was

inaccessible due to dense willow and scrub. Therefore the number of bottle traps used in waterbody 6 was restricted to 20 traps in areas of suitable great crested newt habitat. This is not considered to have affected the validity of the presence/likely absence survey as two or three other survey methods were always used in conjunction with bottle trapping (see Table 4).

2.5.4 Bottle trapping was not carried out at waterbodies 8 and 10 due to access constraints with regards to leaving traps overnight. This has not affected the validity of the presence/likely absence survey as three or four other survey methods were always used instead of bottle trapping (see Table 4).

2.5.5 Cattle were occasionally present in the field where waterbody 3 is located. It was considered a risk that the cattle may trample bottle traps overnight, potentially injuring/killing any individuals caught in the traps at the time and/or making the bottle traps irretrievable from the deeper areas of the pond. Therefore, a temporary electric fence was set up around the pond to deter the cows from entering the pond on nights where bottle traps had been set. Photographs of this fence can be seen in Appendix C.

2.5.6 It should be noted that the survey was designed around detecting great crested newts. Other species of amphibians were recorded where observed. Some species (such as common frog) may breed earlier in the season, however, the methods used frequently record eggs/larval stages of these species and as such this is not considered a significant limitation.

2.5.7 As with many ecological surveys, the effectiveness of these types of survey are subject to a range of seasonal, environmental and behavioural factors. The absence of evidence of a particular species in a survey should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

3 Results

3.1 Habitat Suitability Index and eDNA Sampling

3.1.1 The results of the HSI assessment and eDNA sampling are presented in Table 5 and locations of waterbodies are shown on Figures HE551506-AA-VES-SWI-DR-YE-000009 and HE551506-AA-VES-SWI-DR-YE-000010 in Appendix A. Photographs of most of the waterbodies are provided in Appendix C. The reasons for which each waterbody was scoped in or out of further survey are detailed in Appendix D.

3.1.2 In 2016, eDNA tests were carried out on ponds with HSI assessments of 'below average' or above, with those that came back negative being scoped out of further survey. Due to limited time in 2017, eDNA tests were not carried out, and a full presence/likely absence survey was carried out on all waterbodies that were assessed as 'below average' or above in the HSI assessment. Waterbody 8 was assessed as 'poor' during the HSI assessment, but was scoped in for further survey due to good macrophyte coverage towards the northern end of the waterbody.

Table 5: Results of HSI Assessment and eDNA

Waterbody number	Date of HSI	HSI score	HSI assessment	Date of eDNA	eDNA result	Presence/likely absence survey required?
1	08/02/2017	0.40	Poor	N/A	N/A	No
2	04/04/2017	0.37	Poor	N/A	N/A	No
3	14/06/2016	0.92	Excellent	14/06/2016	Positive	Yes
4	14/06/2016	0.68	Average	14/06/2016	Negative	No
5	21/03/2017	0.78	Good	N/A	N/A	Yes
6	04/04/2017	0.60	Average	N/A	N/A	Yes
7	22/03/2017	N/A	N/A	N/A	N/A	No
8	23/03/2017	0.40	Poor	N/A	N/A	Yes
9	09/06/2016	0.58	Average	09/06/2016	Negative	No
10	23/03/2017	0.77	Good	N/A	N/A	Yes
11	09/06/2016	0.39	Poor	N/A	N/A	No
12	22/03/2017	0.33	Poor	N/A	N/A	No
13	23/03/2017	0.47	Poor	N/A	N/A	No

3.2 Presence/Likely Absence Survey and Population Size Class Assessment

3.2.1 From the 13 waterbodies initially assessed, 5 waterbodies were chosen for further survey as they were assessed as having some suitability to support great crested newts through HSI assessment and/or they tested positive during eDNA sampling. The remaining 8 waterbodies were not surveyed as they were assessed as not suitable to support great crested newts through HSI assessment and/or they tested negative during eDNA sampling.

3.2.2 Out of the five waterbodies surveyed, great crested newts were only recorded in waterbody 3 throughout the course of the surveys. More detailed survey findings are presented in Appendix E.

3.2.3 The maximum count of great crested newts observed in waterbody 3 were 6 adults in bottle traps on visit 6, and 10 adults through torching on visit 4. This results in a population size class estimate of 'small'. Photographs were also taken and subsequently compared, where possible, of great crested newt underside patterns, which established that at least 12 individuals were present in waterbody 3. These photographs are provided in Appendix F.

3.2.4 Throughout the surveys, a number of palmate newts, and smooth newts were recorded alongside great crested newts in waterbody 3. Common frog and common toad tadpoles were found at each waterbody except waterbody 10 where only common toad tadpoles were found.

3.2.5 Waterbody 3 was most suited to great crested newts, containing aquatic vegetation, suitable prey, terrestrial habitat nearby for hibernation, and no fish. All other waterbodies contained high numbers of stickleback species (*Gasterosteidae)*, with pike (*Esox lucius)* and minnows (*Phoxinus phoxinus)* also being present in waterbody 8. Waterfowl were present at waterbody 5 and waterbody 10.

4 Discussion and Recommendations

4.1 Discussion

4.1.1 During the presence/likely absence survey, a population of great crested newts was found in waterbody 3. Great crested newts were found at multiple life stages including egg, juvenile, and adult. Palmate and smooth newts were also found in this waterbody.

4.1.2 The only amphibians observed in waterbodies 5, 6, 8, and 10 during the survey were numerous tadpoles of common frog and toad.

4.1.3 A complete assessment of the impact on great crested newt across the chosen route option along with mitigation measures will be provided within the Environmental Impact Assessment (EIA).

4.2 Recommendations

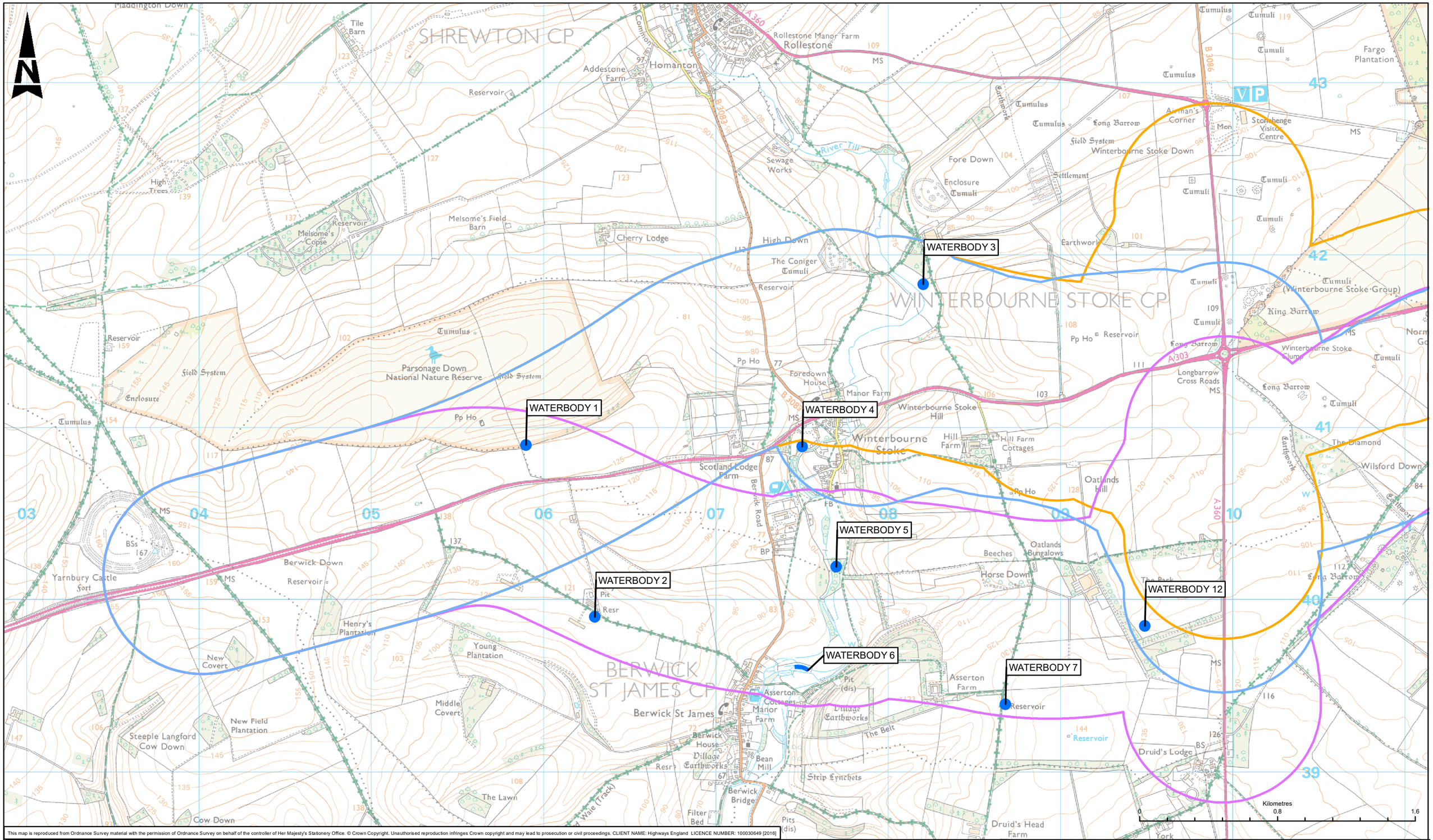
4.2.1 Given the presence of great crested newts in waterbody 3, a European Protected Species licence for great crested newts may be required for the Scheme, depending on final layout, and therefore mitigation will be necessary following that laid out in the Great Crested Newt Mitigation Guidelines[5].

4.2.2 Consideration should also be given to other amphibian species, including palmate newt, smooth newt, common frog and common toad, found to be present in the study area. These should also be subject to assessment within the Environmental Impact Assessment (EIA) for the project and suitable mitigation prescribed.

Appendices

Appendix A Figures

A.1 Figure 1: Location of Waterbodies within 575 metres of Route Options Page 1 of 2 HE551506-AA-VES-SWI-DR-YE-000009



LEGEND

- WATERBODY (POINT LOCATION)
- WATERBODY (LINEAR LOCATION)
- ROUTE OPTION 1NA 575M BUFFER
- ROUTE OPTION 1SA 575M BUFFER
- ROUTE OPTION 1ND 575M BUFFER

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)

Construction

None

Maintenance / Cleaning

None

Use

None

Decommission/ Demolition

None

Rev	Date	Description	By	Chk'd	App'd
P02	31/10/17	FIRST ISSUE	SJ	CD	LB

Drawing Status: FIT FOR INTERNAL REVIEW AND COMMENT
Suitability: S3

Project Title: A303 AMESBURY TO BERWICK DOWN

Client: highways england

Drawing Title: LOCATION OF WATERBODIES WITHIN 575 METRES OF ROUTE OPTIONS PAGE 1 OF 2

Designers: ARUP ATKINS

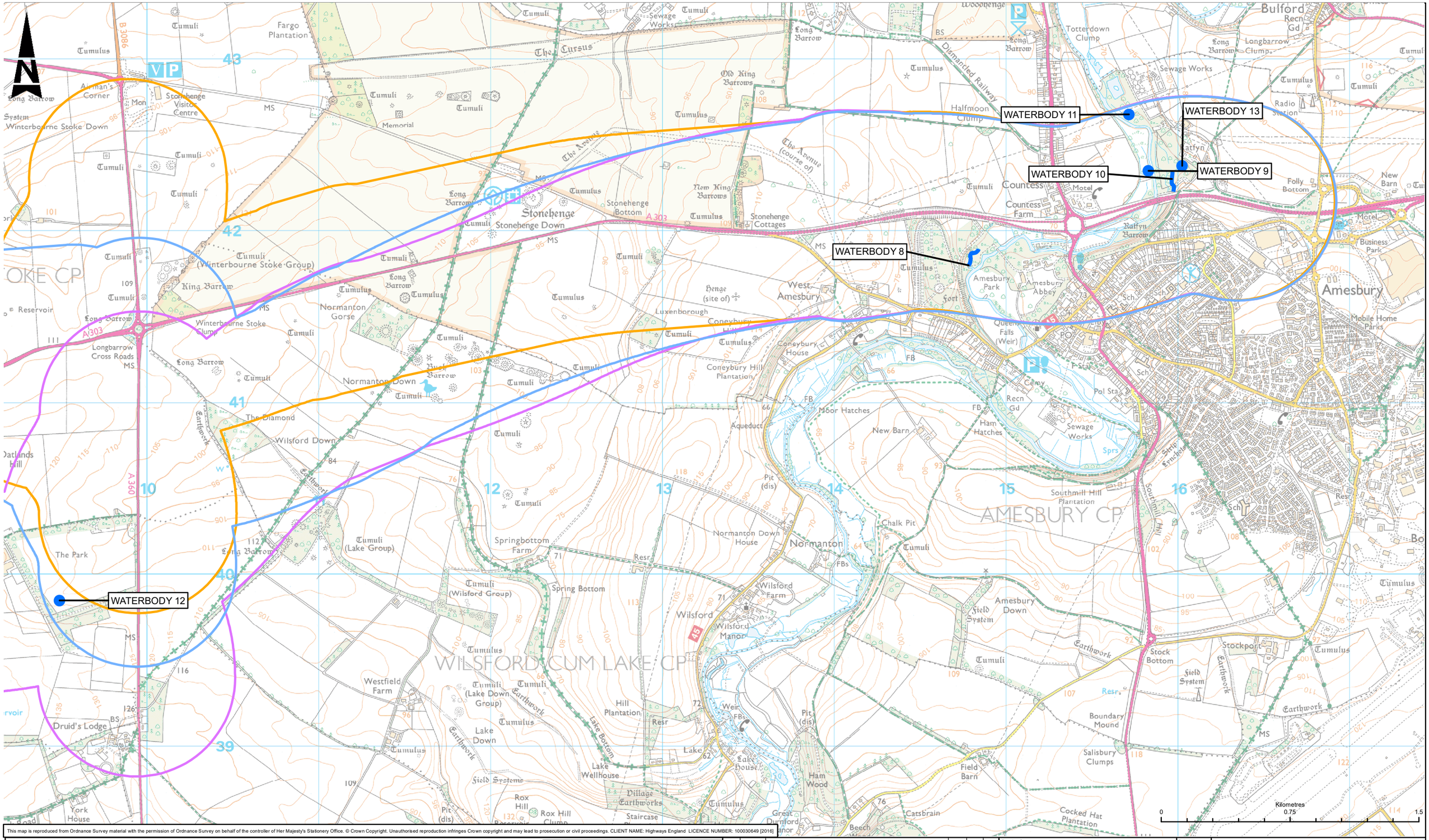
Scale	Designed / Drawn	Checked	Approved	Authorised
1:20,000	SJ	CD	LB	SH

Original Size	Date	Date	Date	Date
A3	31/10/17	31/10/17	31/10/17	31/10/17

Drawing Number: Project | Originator | Volume | Location | Type | Role | Number: HE551506-AA-VES-SWI-DR-YE-000009

Revison: P02

A.2 Figure 2: Location of Waterbodies within 575 metres of Route Options Page 2 of 2 HE551506-AA-VES-SWI-DR-YE-000010



LEGEND

- WATERBODY (POINT LOCATION)
- WATERBODY (LINEAR)
- ROUTE OPTION 1NA 575M BUFFER
- ROUTE OPTION 1SA 575M BUFFER
- ROUTE OPTION 1ND 575M BUFFER

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made in the design hazard log)
Construction
None
Maintenance / Cleaning
None
Use
None
Decommission/ Demolition
None

Rev	Date	Description	By	Chk'd	App'd
P02	31/10/17	FIRST ISSUE	SJ	CD	LB

Drawing Status: FIT FOR INTERNAL REVIEW AND COMMENT
Suitability: S3

Client: highways england

Designers: ARUP ATKINS

Project Title: A303 AMESBURY TO BERWICK DOWN

Drawing Title: LOCATION OF WATERBODIES WITHIN 575 METRES OF ROUTE OPTIONS PAGE 2 OF 2

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1:20,000	SJ	CD	LB	SH

Original Size	Date	Date	Date	Date
A3	31/10/17	31/10/17	31/10/17	31/10/17

Drawing Number: HE551506-AA-VES-SWI-DR-YE-000010 (Project | Originator | Volume | Location | Type | Role | Number)

Revison: P02

Appendix B Weather Conditions During Surveys

B.1 Weather Conditions During Presence/Likely Absence Surveys

Table 6: Weather Conditions During Presence/Likely Absence Surveys

Date	Morning/ evening	Weather Conditions			
		Temp (°C)	Wind speed (Beaufort Scale)	Cloud cover (%)	Precipitation
04/04/2017	Evening	10	3	25	Dry
05/04/2017	Morning	7	1	50	Dry
19/04/2017	Evening	9	2	20	Dry
20/04/2017	Morning	7	1	90	Dry
03/05/2017	Evening	11	2	100	Dry
04/05/2017	Morning	8	2	90	Dry
16/05/2017	Evening	14	2	100	Light drizzle
17/05/2017	Morning	14	1	100	Rain
06/06/2017	Evening	13	2	90	Dry
07/06/2017	Morning	13	3	30	Dry
13/06/2017	Evening	18	1	10	Dry
14/06/2017	Morning	13	1	50	Dry

Appendix C Photographs of Waterbodies

C.1 Photographs of Waterbodies

Table 7: Photographs of Waterbodies

Waterbody 1	
No photos available for waterbody 1.	
Waterbody 2	
	

Waterbody 3 (with temporary electric fence)

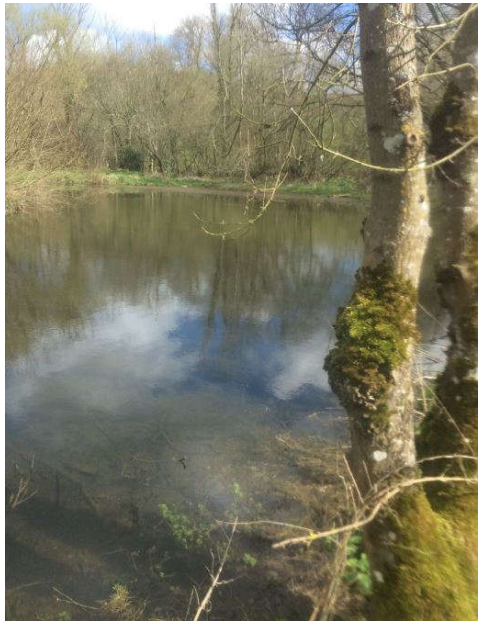


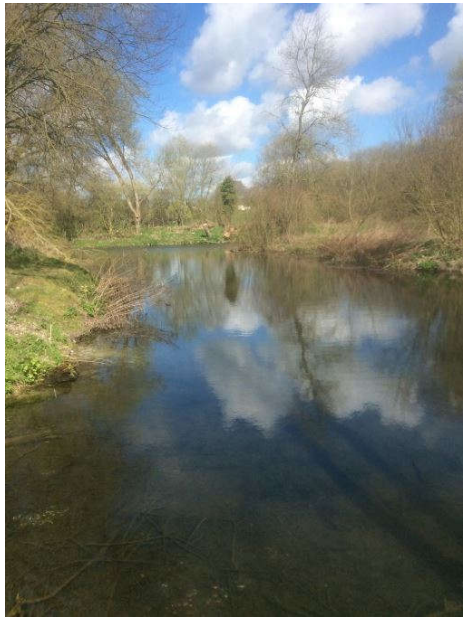


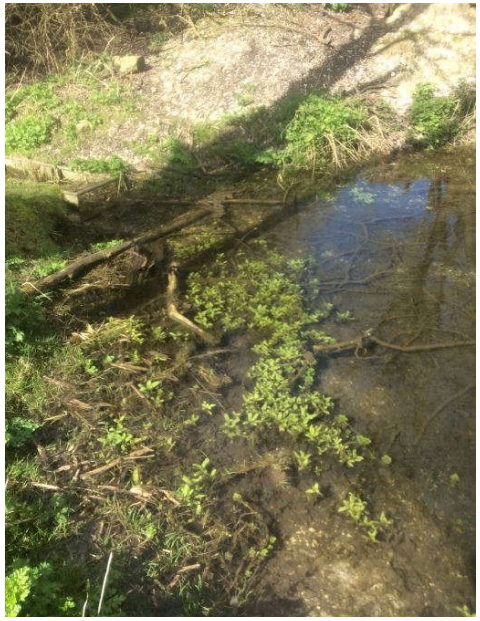

Waterbody 4

No photos for waterbody 4 available.

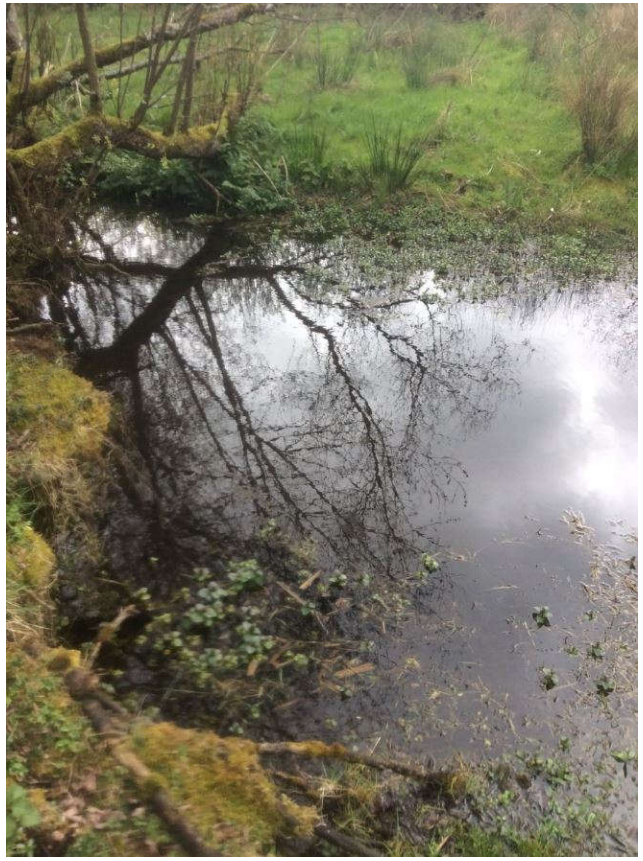
Waterbody 5



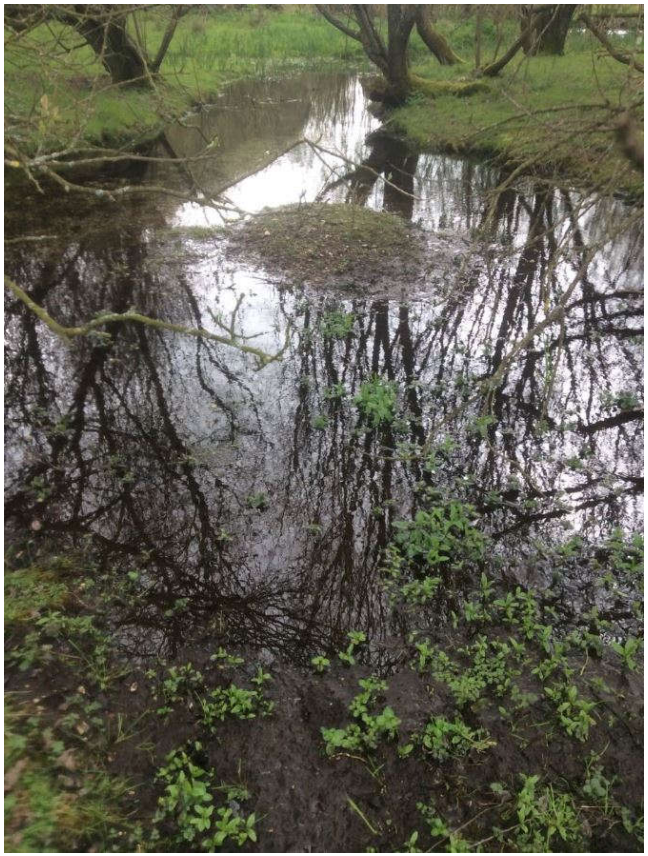




Waterbody 6



Waterbody 6 continued



Waterbody 7

No photos for waterbody 7, as waterbody confirmed absent.

Waterbody 8

No photos taken of waterbody 8.

Waterbody 9

No photos available for waterbody 9.

Waterbody 10

Waterbody 10 continued

Waterbody 11

No photos available for waterbody 11.

Waterbody 12

No photos taken of waterbody 12.

Waterbody 13

Appendix D Details of Scoping Exercise

D.1 Details of Scoping Exercise

Table 8: Details of Waterbodies Scoped in or out of Further Survey.

Waterbody number	Grid reference	Date of HSI	HSI score and assessment	Date of eDNA sampling	eDNA result	Comments	Presence/likely absence survey required?
1	SU059409	08/02/2017	0.40, poor	N/A	N/A	Small waterbody located on the edge of Parsonage Down National Nature Reserve north of the A303, which almost certainly dries annually. Very isolated from other ponds (only one within 1km not including those on the distal side of barriers). Limited and poor terrestrial habitat nearby.	No, due to 'poor' HSI assessment, isolation, limited and poor terrestrial habitat, and annual drying.
2	SU063399	04/04/2017	0.37, poor	N/A	N/A	Small waterbody located south of the A303, within fields and adjacent to farm buildings.	No, due to 'poor' HSI assessment.
3	SU081418	14/06/2016	0.92, excellent	14/06/2016	Positive	Medium-sized waterbody located north of the A303 within fields and next to the River Till. Great crested newt population present in 2003[6].	Yes
4	SU074408	14/06/2016	0.68, average	14/06/2016	Negative	Small waterbody located south of the A303 within Winterbourne Stoke and next to the River Till. River-fed so eDNA test may not be reliable due to dilution risk. However, not proposed for further surveying in 2017 as other ponds were surveyed in the area (waterbodies 3 and 5).	No, due to negative eDNA result and other waterbodies surveyed in the area.
5	SU076401	21/03/2017	0.78, good	N/A	N/A	Medium-sized waterbody located south of the A303 and Winterbourne Stoke	Yes

[6] Halcrow for Highways Agency (2003). A303 Stonehenge Improvement, Environmental Statement.

						and adjacent to the River Till. River-fed so decided against water sampling for eDNA testing. High quality terrestrial habitat with few mallards present.	
6	SU074395	04/04/2017	0.60, average	N/A	N/A	Medium-sized waterbody located south of the A303 and adjacent to the River Till just north of Berwick St James.	Yes
7	SU086393	22/03/2017	N/A	N/A	N/A	Reservoir marked on OS maps within field, but confirmed to be absent by Arup ecologists on 22/03/2017.	No, as waterbody was confirmed to be absent.
8	SU147418	23/03/2017	0.40, poor	N/A	N/A	Drain/outlet from River Avon located south of the A303. Included as highlighted in previous reports for the project. Scoped in for further survey due to good macrophyte coverage towards northern end of waterbody.	Yes
9	SU158423	09/06/2016	0.58, average	09/06/2016	Negative	Small waterbody/drain located north of the A303 and just west of the River Avon. Tested negative for eDNA during 2016 water sampling. No further survey proposed. As of 14th April 2017 pond had reduced in size due to reed encroachment and was covered in duckweed.	No, due to negative eDNA result, and reed and duckweed encroachment.
10	SU159422	23/03/2017	0.77, good	N/A	N/A	Ratfyn farm ditch adjacent to Avon with low flow, located directly adjacent to the A303 to the north and south (continues under road). Included as highlighted in previous reports.	Yes
11	SU157426	09/06/2016	0.39, poor	N/A	N/A	Small waterbody located north of the A303 and between the River Avon and the Sewage Works south west of Bulford. Recorded in previous reports but not found on OS maps. Obstructed by vegetation and dry at the time of HSI. 2017 update visit found pond to be even more obstructed by vegetation, and had	No, due to 'poor' HSI assessment and vegetation obstruction.

						very little water (only some shallow pooling on the side channel).	
12	SU159423	22/03/2017	0.33, poor	N/A	N/A	Manmade plastic/reservoir with mallard present. Carp observed. Fed by surface runoff, possibly from nearby cattle farm.	No, due to 'poor' HSI assessment, presence of fish and mallard, and surface runoff.
13	SU094398	23/03/2017	0.47, poor	N/A	N/A	Pond with ornamental waterfowl. Limited aquatic macrophytes.	No, due to 'poor' HSI assessment, presence of waterfowl, and limited aquatic macrophytes.

Appendix E Survey Results

E.1 Presence/Likely Absence Survey Results

Table 9: Waterbody 3 Presence/Likely Absence Survey Results.

Waterbody 3					
Date	**Visit**	**Method**	**Species**	**Abundance**	**Comments**
4th/5th April 2017	1	Egg search	Great crested newt	Numerous	Numerous folded leaves on water forget me not *Myosotis scorpioides* on western side of pond.
19th/20th April 2017	2	Torching	Great crested newt	4 female	Common frog also observed.
			Smooth newt	3 male	
			Palmate newt	2 female	
			Unidentified newt	2	
		Egg searching	Great crested newt	1 egg	
			Smooth/palmate newt	1 egg	
3rd/4th May 2017	3	Torching	Great crested newt	3 female	Other: 1 female great crested newt observed walking towards pond from north.
			Smooth newt	4	
			Palmate newt	2	
		Bottle traps	Great crested newt	2 female	
			Smooth newt	1 male	
		Refugia search	Great crested newt	1 female	
		Other	Great crested newt	1 female	
16th/17th May 2017	4	Torching	Great crested newt	3 male 7 female	
			Smooth newt	2 male	
		Egg search	Great crested newt	1 egg	
6th/7th June 2017	5	Torching	Great crested newt/smooth newt/palmate newt	>100 larvae, including great crested newt	
		Bottle traps	Great created newt	19 larvae	
			Common toad/frog	Numerous tadpoles	
13th/14th June	6	Bottle traps	Great crested newt	6 adults	

2017			Common toad/frog	Numerous tadpoles	
		Bottle traps and torching	Great crested newt	Numerous juveniles	

Table 10: Waterbody 5 Presence/Likely Absence Survey Results

Waterbody 5					
Date	**Visit**	**Method**	**Species**	**Abundance**	**Comments**
4th/5th April 2017	1	Torching and bottle traps	Common toad	Numerous tadpoles	Lots of stickleback also observed. Waterfowl present.
19th/20th April 2017	2	Bottle traps	Common toad	Numerous tadpoles	Lots of stickleback also observed. Waterfowl present.
3rd/4th May 2017	3	Torching and bottle traps	Common toad	Numerous tadpoles	Stickleback also observed. Waterfowl present.
			Common frog	Numerous tadpoles	
16th/17th May 2017	4	Torching and bottle traps	Common toad	Numerous tadpoles	Stickleback also observed. Waterfowl present.
			Common frog	Numerous tadpoles	

Table 11: Waterbody 6 Presence/Likely Absence Survey Results

Waterbody 6					
Date	**Visit**	**Method**	**Species**	**Abundance**	**Comments**
4th/5th April 2017	1	Torching and bottle traps	Common toad	Numerous tadpoles	Lots of stickleback also observed.
19th/20th April 2017	2	Bottle traps	Common toad	Numerous tadpoles	Sticklebacks observed while torching and in bottle trap. Greater diving beetle in bottle trap.
3rd/4th May 2017	3	Torching and bottle traps	Common frog	Numerous tadpoles	Stickleback also observed.
			Common toad	Numerous tadpoles	
16th/17th May 2017	4	Torching and bottle traps	Common frog	Numerous tadpoles	Stickleback also observed.
			Common toad	Numerous tadpoles	

Table 12: Waterbody 8 Presence/Likely Absence Survey Results

Waterbody 8					
Date	**Visit**	**Method**	**Species**	**Abundance**	**Comments**
4th/5th April 2017	1	Torching	Common frog	300 tadpoles minimum	Two pike, tens of stickleback, and small minnows also observed.

3rd/4th May 2017	2	Torching	Common frog	Numerous tadpoles	Stickleback, pike, and minnow also observed.
			Common toad	Numerous tadpoles	
16th/17th May 2017	3	Torching	Common frog	Numerous tadpoles	Stickleback also observed.
			Common toad	Numerous tadpoles	
6th/7th June 2017	4	Torching	Common frog	Numerous tadpoles	Stickleback also observed.
			Common toad	Numerous tadpoles	

Table 13: Waterbody 10 Presence/Likely Absence Survey Results

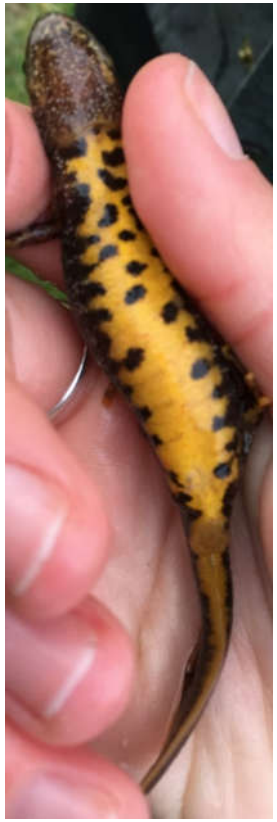
Waterbody 10					
Date	**Visit**	**Method**	**Species**	**Abundance**	**Comments**
3rd/4th May 2017	1	N/A	N/A	N/A	**No amphibians observed.** Stickleback and lots of waterfowl present.
16th/17th May 2017	2	N/A	N/A	N/A	**No amphibians observed.** Stickleback and lots of waterfowl present.
6th/7th June 2017	3	N/A	Common toad	Multiple tadpoles	Stickleback also observed.
13th/14th June 2017	4	N/A	N/A	N/A	**No amphibians observed.** Stickleback and lots of waterfowl present.

Appendix F Great Crested Newt Underside Pattern Photographs

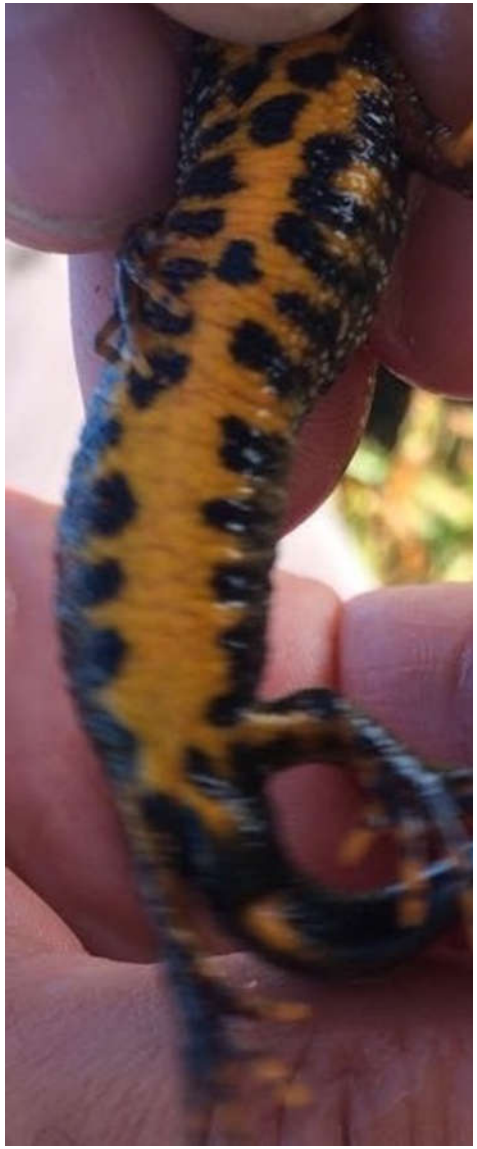
F.1 Photographs of Great Crested Newt Underside Patterns

Visit 1
No photographs taken during visit 1
Visit 2
No photographs taken during visit 2
Visit 3

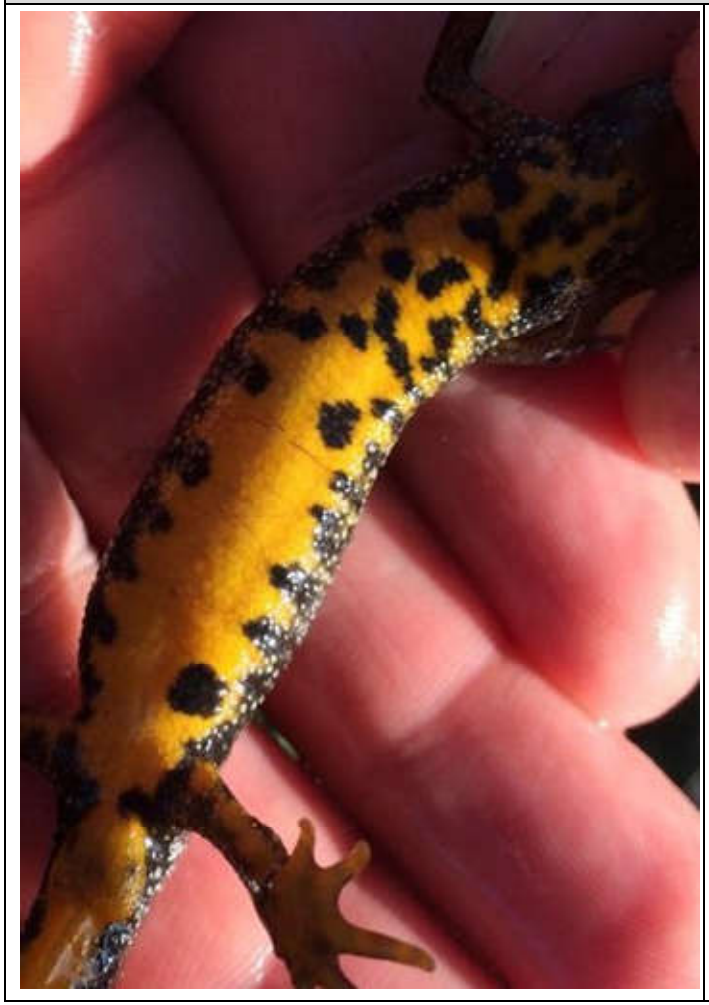


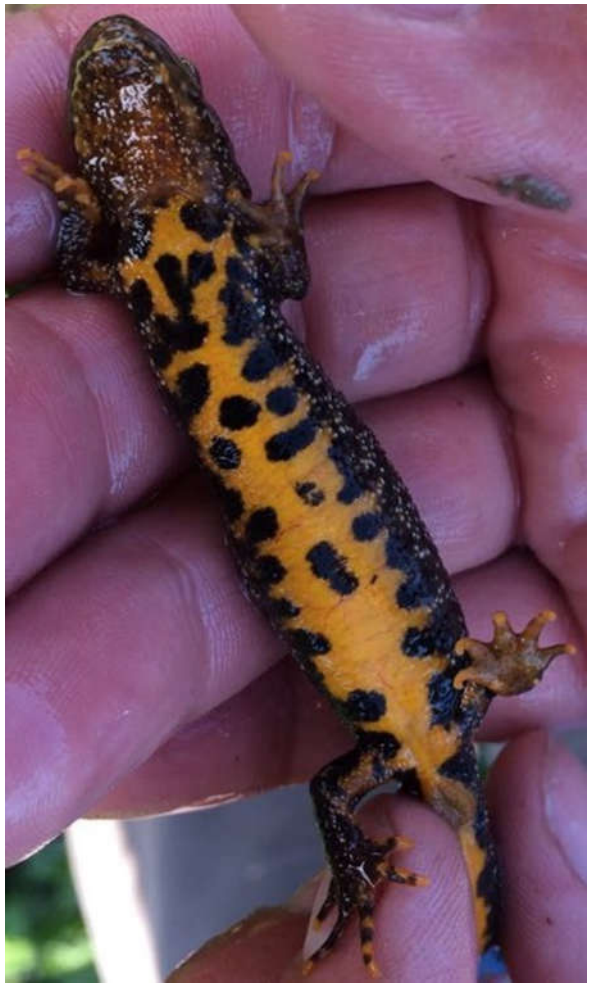


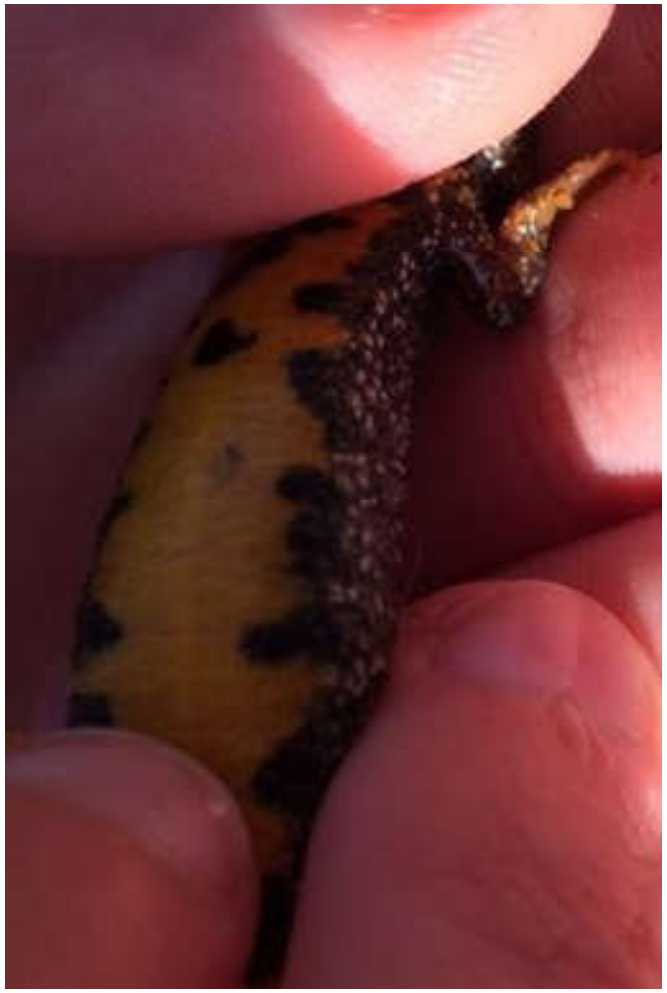

Visit 4	
No photographs taken during visit 4.	
Visit 5	
	

Visit 6		
		

Visit 6 continued







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