

A303 Amesbury to Berwick Down

TR010025

Deadline 7
8.45 - Errata Report

APFP Regulation 5(2)(q)

Planning Act 2008

The Infrastructure Planning (Examination Procedure) Rules 2010

August 2019



Infrastructure Planning

Planning Act 2008

The Infrastructure Planning (Examination Procedure)

Rules 2010

A303 Amesbury to Berwick Down

Development Consent Order 20[**]

ERRATA Report

Regulation Number:	Regulation 5(2)(q)
Planning Inspectorate Scheme Reference	TR010025
Application Document Reference	8.45
Author:	A303 Amesbury to Berwick Down Project Team, Highways England

Version	Date	Status of Version
Rev 0	09.08.2019	Deadline 7 Issue

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1 Introduction

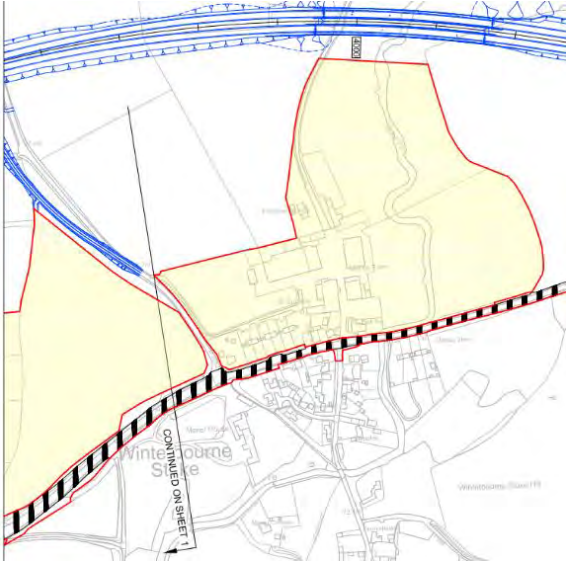
1.1 Explanation of Development Consent Order application errata

- 1.1.1 This document is to present any errata that have been identified within the Development Consent Order (DCO) application documents for the A303 Amesbury to Berwick Down Scheme.
- 1.1.2 Errata are errors within the DCO application documents, which are minor in nature and do not change the meaning of documents, analysis or any assessment. These items are presented in Table 2-1 below, where a correction is provided for clarification.

2 Development Consent Order Application Errata

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text			
APP-020	Draft Development Consent Order	Schedule 3 Part 2 – HIGHWAYS TO BE STOPPED UP FOR WHICH NO SUBSTITUTE IS TO BE PROVIDED - Page 72 (in dDCO Rev 4 [REP6-005])	Distance for proposed stopping up of Byway BULF12 is wrong	<p>Extent of proposed stopping up on Byway BULF12 should read “100 metres” as shown below:</p> <table border="1"> <tr> <td>In the parish of Bulford; in the County of Wiltshire</td> <td>Byway BULF12</td> <td>A length from its junction with the existing A303 for a distance of 270 metres in a generally northerly direction Should read 100 metres (as shown on sheet 11 of the rights of way and access plans)</td> </tr> </table> <p>This erratum will be corrected in the next version of the draft DCO, which is to be submitted at examination deadline 8 (6 September 2019).</p>	In the parish of Bulford; in the County of Wiltshire	Byway BULF12	A length from its junction with the existing A303 for a distance of 270 metres in a generally northerly direction Should read 100 metres (as shown on sheet 11 of the rights of way and access plans)
In the parish of Bulford; in the County of Wiltshire	Byway BULF12	A length from its junction with the existing A303 for a distance of 270 metres in a generally northerly direction Should read 100 metres (as shown on sheet 11 of the rights of way and access plans)					
APP-020	Draft Development Consent Order	Schedule 3 Part 3 – THE EXISTING A303 - Page 74 (in dDCO Rev 4 [REP6-005])	Text error within the Draft DCO in relation to the PMA Reference 10	<p>PMA Reference 10 should read to the “west” as shown below:</p> <table border="1"> <tr> <td> <p>Reference 10</p> <p>New private means of access from the new byway open to all traffic reference F over Green Bridge 2, to be granted for the benefit of the land to the east of byway WST06B (including a drainage pond)</p> <p>(as shown on sheet 4 of the</p> </td> <td> <p>...to the west of..</p> </td> </tr> </table> <p>This erratum will be corrected in the next version of the draft DCO, which is to be submitted at examination deadline 8 (6 September 2019).</p>	<p>Reference 10</p> <p>New private means of access from the new byway open to all traffic reference F over Green Bridge 2, to be granted for the benefit of the land to the east of byway WST06B (including a drainage pond)</p> <p>(as shown on sheet 4 of the</p>	<p>...to the west of..</p>	
<p>Reference 10</p> <p>New private means of access from the new byway open to all traffic reference F over Green Bridge 2, to be granted for the benefit of the land to the east of byway WST06B (including a drainage pond)</p> <p>(as shown on sheet 4 of the</p>	<p>...to the west of..</p>						
APP-015	De-trunking Plans	Sheet 2 of 2	Order Limits red line missing from	<p>Sheet 2 of the De-Trunking Plans omitted to show the Order limits.</p> <p>Order limits will be added to Sheet 2 of the De-Trunking Plans and it is proposed that a revised version of the De-Trunking Plans will be submitted prior to the close of examination (2 October</p>			

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
			plan	<p>2019) with such revision also incorporating proposed changes NMC-01 and NMC-02 which relate to matters of de-trunking (for details see the Applicant’s Proposed Changes Application [AS-067]), in the event that those changes are accepted by the Examining Authority in its Procedural Decision which is scheduled to be issued on 27 September 2019.</p> <p>‘Before’ extract from “TR010025 – 2.12 De-Trunking Plans Sheet 2 of 2 (Order limits missing):</p> 

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
				<p>'After' extract from proposed "TR010025 – 2.12 De-Trunking Plans Sheet 2 of 2 (Order limits added):</p> 
APP-043	ES Chapter 5	Para 5.9.28	Error in text	<p>The reference to a decrease of 10,400 vehicles per day on the A303 is a drafting error only and a much smaller decrease of 860 vehicles per day should have been reported. The correct decrease of 860 was utilised in the air quality modelling assessment, therefore the conclusions (small anticipated improvements in air quality at Receptors R3 and R7) are unchanged.</p> <p>The correct decrease is shown on Figure 1: Updated Figure 9.4 from the Transport</p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text								
				<p>Assessment which is contained within the written response to the second round of examiners questions for air quality and emissions (AQ2.1) [REP6-020].</p> <p>The text in para 5.9.28 should be amended as shown below:</p> <p><i>“At Deptford, receptors closest to the A303 (R7) and the A36 (R3) are predicted to experience small decreases in NO2 concentration (-0.5 to -2.0µg/m3) with the Scheme in place, resulting in concentrations of 11.2–12.6 µg/m3 . This is due to a decrease in AADT of approximately 10,400 860 vehicles (including approximately 800 HDVs) along the A303 and an increase in AADT of approximately 600 vehicles (including approximately 30 fewer HDVs) along the A36.”</i></p>								
APP-043	ES Chapter 5	Table 15.4	Error in Table 15.4	<p>No dust assessment was carried out for the operational phase of the project as this does not involve notable dust-generating activities. As such, no significant dust impacts are expected as a result of the operation of the Scheme, at Countess Farm or any other location.</p> <p>The reference in the ES [APP-053], Table 15.4 to potential adverse operational dust effects at Countess Farm is therefore an error. Reference to ‘Dust (potential adverse)’ should be removed, as shown below.</p> <table border="1" data-bbox="1010 922 1926 1098"> <tr> <td>Countess Farm</td> <td>High</td> <td>Visual (major) Noise (potential adverse) Dust (potential adverse)</td> <td>Permanent</td> <td>Local</td> <td>Large adverse</td> <td>On and off-site planting and noise barriers</td> <td>Moderate adverse</td> </tr> </table>	Countess Farm	High	Visual (major) Noise (potential adverse) Dust (potential adverse)	Permanent	Local	Large adverse	On and off-site planting and noise barriers	Moderate adverse
Countess Farm	High	Visual (major) Noise (potential adverse) Dust (potential adverse)	Permanent	Local	Large adverse	On and off-site planting and noise barriers	Moderate adverse					
APP-045	ES Chapter 7	Para 7.6.4	Error in text	<p>The text should be amended as shown below:</p> <p>At the western end of the study area, the landform is elevated and undulating across Berwick Down (up to 150m Above Ordnance Datum (AOD)) and Parsonage Down National Nature Reserve (NNR) (80m between 90m AOD and 155m AOD), before falling towards Winterbourne Stoke (75m AOD).</p>								

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-045	ES Chapter 7	Para 7.9.20	Error in text	<p>The text should be amended as shown below:</p> <p>There would be localised removal of existing vegetation within the Scheme boundary at the beginning of the construction phase. With reference to the Arboricultural Impact Assessment Report (Appendix 7.10) and drawings 7A.19 to 7A.24 which identify trees to be removed, or impacted upon, 478 191 tree groups features would be removed from within the Scheme boundary.</p>
APP-045	ES Chapter 7 Landscape and Visual Impact Assessment	7.9.21	Error in text	<p>The text should be amended as shown below:</p> <p>None of these tree groups are high quality (Category A) trees, with 43 45 of the tree groups assessed as moderate quality (Category B) and 135 142 of the tree groups assessed as low quality (Category C).</p>
APP-048	ES Chapter 10 Geology and Soils	Section 10.8 Paragraph 10.8.19	Erroneous reference to a '5-year period of conditioning monitoring'	<p>The text should be amended as follows:</p> <p><i>10.8.19 The OEMP sets out the geology and soils-related construction phase monitoring requirements. These are that the contractor shall prepare and implement a gas monitoring procedure based on the potential for presence of underground gases; the contractor would undertake monitoring of the atmosphere within excavations to assess the development of any potentially explosive and / or asphyxiant conditions; and that any land restored to agriculture would be subject to a 5-year period of condition monitoring proceed with full consultation between with the landowner/tenant and the main works contractor and, subsequent to restoration, the main works contractor shall undertake further inspections of restored agricultural land with the landowner/tenant and Highways England's soils experts to assess the progress of the restoration. These will be carried out with timing appropriate to any perceived issues or concerns.</i></p>
APP-051	ES Chapter 13 People and Communities	ES Chapter 13 – Table 13.21	Anomalies within land calculations	<p>The anomalies within the land calculations shown below are drafting errors only. To confirm, these changes do not affect the conclusions of the assessment presented within Chapter 13 of the ES.</p> <p>The existing Table 13.21 should be deleted and replaced with:</p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text				
				Table 13.21: Land Required Temporarily and Permanently for the Construction of the Scheme				
				Agricultural land quality (ha)	Area required during construction (ha)	Total area restored to “unrestricted” agriculture (ha)	Total area restored to permanent chalk grassland (ha)¹	Area permanently required Permanent impact/loss of agricultural land to built form (area in ha)
				Grade 1	3.1	4.0 1.1	2.4 2.0	0
				Grade 2	41.2 41.3	48.0 18.4	20.6 20.5	2.6 2.4
				Subgrade 3a	223.2 223.3	85.9 85.6	109.9	27.5 27.7
				BMV agricultural land	267.5 267.7	404.9 105.1	132.6 132.3	30.1
				Subgrade 3b	29.3	12.4 14.5	8.4 8.5	8.1 6.3
				Grade 4	0	0	0	0
				Grade 5	0	0	0	0
				Total agricultural land	296.8 297.0	117.3 119.6	162.1 140.8	38.5 36.4
				Non-agricultural land	80.2 83.9	0 3.8	0 (21.2) 21.5	

¹ Includes all chalk grassland.

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text			
				Total area restored		123.4	162.3
				Agricultural land area affected by subsoil rights only	46.3		
				Total land affected	427.2		
				¹ Includes all chalk grassland			
APP-051	ES Chapter 13 People and Communities	Section 13.6 Paragraph 13.6.10 and 13.6.13	Incorrect figure references	<p>Paragraph 13.6.10 refers to “Figure 13.3”, this should be deleted and replaced with “<i>Figure 13.1</i>.” as shown below...</p> <p><i>“13.6.10 ALC grades have been evaluated in accordance with the MAFF ALC guidelines (Ref 13.31). The extent and distribution of the different ALC grades and subgrades is shown on Figure 13.3 Figure 13.1 and set out in Table 13.15. The majority of the agricultural land affected (90%) is BMV land in Subgrade 3a (223.2ha: 75%), Grade 2 (41.2ha: 14%) and Grade 1 (3.1ha: 1%). The remaining agricultural land (10%) is of moderate quality in Subgrade 3b (29.3ha).”</i></p> <p>Paragraph 13.6.13 refers to “Figure 13.1”, this should be deleted and replaced with “<i>Figure 13.2</i>” as shown below...</p> <p><i>“13.6.13 There is a comprehensive network of PRoWs in the study area (as shown within Figure 13.1 Figure 13.2) available for use by NMUs. These routes provide connections between Shrewton and Rollestone to Berwick St James and Winterbourne Stoke as well as Larkhill and Countess to Stonehenge, however there is severance experienced at intersections with the A303. Byway AMES12 crosses the existing A303 slightly to the west of Stonehenge and passes directly through the WHS connecting the community of Larkhill to Druids Lodge on the A360.”</i></p>			

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-180	ES Chapter 13	Figure 13.2	Error in Figure title	<p>The title of the Figure should be amended as shown:</p> <p>“FIGURE 13.2 EXISTING NMU ROUTES PUBLIC RIGHTS OF WAY”.</p> <p>The corrected figure is provided in Appendix A of this Report.</p>
APP-181	ES Chapter 13	Figure 13.3 A and B	Error in Figures	<p>The title of the Figure should be amended as shown: “FIGURE 13.3A EXISTING NMU ROUTES PUBLIC RIGHTS OF WAY”.</p> <p>The title of the Figure should be amended as shown: “FIGURE 13.3B EXISTING NMU ROUTES PUBLIC RIGHTS OF WAY”.</p> <p>The following errors as shown within the extracts below have been identified in Figures 13.3A and 13.3B. The corrected figures are provided within Appendix A of this Report. To confirm, these are drafting errors only and do not affect the conclusions of the assessment presented within Chapter 13 of the ES.</p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
				<p>The map displays the proposed route for the A303 Amesbury to Berwick Down project. Key features include: <ul style="list-style-type: none"> Proposed byway open to all traffic: Indicated by a blue line. Proposed shared cycleway: Indicated by an orange line. Proposed lane: Indicated by a green line. Proposed restricted byway: Indicated by a red line. Proposed scheme boundary: Indicated by a dashed line. Callouts on the map include: <ul style="list-style-type: none"> "CAN WE SHOW LONGER LINES AND MOVE NOTES TO THE RIGHT?" "RESTRICTED BYWAY SHOULD NOT CROSS THE EASTERN ARM OF AIRMAN'S ROUNDABOUT. REMOVE RESTRICTED BYWAY (MAGENTA LINE) FROM THE NORTH SIDE OF THE EASTERN ARM OF AIRMAN'S CORNER." "PROPOSED BYWAY OPEN TO ALL TRAFFIC. CONVERT GREEN COLOUR TO BLUE." "REMOVE GREEN LINES NORTH AND SOUTH OF GREEN BRIDGE 2." "REMOVE GREEN LINE." "PROPOSED BYWAY OPEN TO ALL TRAFFIC. ADD NEW BLUE LINE FOR EXTENT OF THE LINE SEE GA PLANG SHEET 2 & 3." "PROPOSED SHARED CYCLEWAY. CONVERT GREEN COLOUR TO BROWN. FOR EXACT EXTENT OF THE LINE SEE GA PLANG SHEET 4 & 5." "update copyright?" A legend on the right side of the map defines the line types and colors. Additional notes and a copyright notice for 2019 are also present. </p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 3.3 Paragraph 3.3.7	Sentence notes three assessments, but four were undertaken.	<p>Delete “Three” and replace with “Four” as shown below...</p> <p><i>“Three Four preliminary assessments were undertaken to inform Historic England’s (formerly English Heritage) and the National Trust’s policy position regarding A303 Scheme options and design elements:”</i></p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 5.2 (pp. 69, 70); Section 5.7 (p. 103)	Referencing of the Stonehenge and Avebury Research Framework 2015 is inconsistent.	Delete "The Stonehenge and Avebury Research Framework 2015 (Wessex Archaeology 2016)" and replace with "(Leivers and Powell 2016)" as shown below: <i>"The Stonehenge and Avebury Research Framework 2015 (Wessex Archaeology 2016) (Leivers and Powell 2016)".</i>
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 5.4 Paragraph 5.4.20 (p. 94)	Incorrect internal cross-reference to 'WHS Management Plan in HIA Section 12.1, World Heritage Convention Error! Reference source not found. '.	Amend the text as shown below... <i>"The HIA considers the ways in which the Scheme delivers against the aims and policy set out in the 2015 WHS Management Plan in HIA Section 12.1 12.3, Alignment with WHS Management Plan vision, aims and policies, World Heritage Convention".</i>
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 5.4 Paragraph 5.4.21 (p. 94)	Formatting error. Delete paragraph 5.4.21 as it is repetition of paragraph 12.1.1.	Delete the following text...

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
				<p>5.4.21 The Convention Concerning the Protection of the World Cultural and Natural Heritage (the World Heritage Convention) is the principal global instrument for the protection of cultural and natural heritage. The UK ratified the Convention on 29 May 1984. Article 4 of the Convention sets out the duties of States Parties:</p> <p><i>'Each State Party to this Convention recognizes that the duty of ensuring the identification, protection, conservation, presentation and transmission to future generations of the cultural and natural heritage referred to in Articles 1 and 2 and situated on its territory, belongs primarily to that State. It will do all it can to this end, to the utmost of its own resources and, where appropriate, with any international assistance and co-operation, in particular, financial, artistic, scientific and technical, which it may be able to obtain.'</i> (UNESCO 1972).</p>
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 5.5 Paragraphs 5.5.1 – 5.5.3) (pp. 94 – 95)	Formatting error. Delete heading and paragraphs 5.5.1 – 5.5.3 repetition of paragraphs 12.2.1 to 12.2.3 inclusive.	<p>Delete heading 5.5 and paragraphs 5.5.1 to 5.5.3 inclusive.</p> <p>5.5 Operational Guidelines for the Implementation of the World Heritage Convention</p> <p>5.5.1 The Operational Guidelines note that 'each nominated property should have an appropriate management plan or other documented management system which must specify how the Outstanding Universal Value of a property should be preserved, preferably through participatory means.' (UNESCO 2017, para. 108). <i>'States Parties are responsible for implementing effective management activities for a World Heritage property. State Parties should do so in close collaboration with property managers, the agency with management authority and other partners, and stakeholders in property management.'</i> (ibid., para. 117).</p> <p>5.5.2 In England, these commitments are fulfilled through the statutory planning system, designation of specific assets within World Heritage properties and the development of WHS Management Plans.</p> <p>5.5.3 The 2015 WHS Management Plan (Simmonds and Thomas 2015) is in place to protect and manage the property as required by the World Heritage Convention. It deals with policy aspects, legal status and protective measures and with the practicalities of day-to-day administration and management.</p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 6.8 Paragraphs 6.8.6 (p. 161)	Typo – ' <u>Wold Heritage Site</u> '.	Delete "Wold" and replace with "World" as shown below... "6.8.6 A number of significant excavations have taken place outside the Wold World Heritage Site;"
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 6.9 (p.230)	Missing word.	Insert the word "barrow" as per the below amended paragraph: "Another possible barrow lies just outside the scheduled monument boundary at the western edge of the wood adjacent to the twin barrow (MWI13068)."
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 6.9 (p. 263)	Incorrect numbering of asset groups – ' <u>... including Winterbourne Stoke Crossroads (AG08) and Old and New King Barrows (AG16) ... with sightlines to the long barrows to the west at Winterbourne Stoke Crossroads (AG08) and The Diamond (AG09).</u> '	Amend to ' <u>... including Winterbourne Stoke Crossroads (AG08) (AG12) and Old and New King Barrows (AG16) (AG26) ... with sightlines to the long barrows to the west at Winterbourne Stoke Crossroads (AG08) (AG12) and The Diamond (AG09) (AG13).</u> '

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 6.10 Paragraph 6.10.34 (p. 481)	Hengiform enclosure incorrectly labelled [10002], and Winterbourne Stoke Copse should be Winterbourne Stoke Clump.	Amended paragraph as shown below: “Hengiform enclosure [10002] [10000]” <i>Multi-channel GPR survey identified a small possible ‘hengiform’ monument (GPR Survey, 10002-10000, Highways England 2018) previously identified as an anomaly in Gradiometer Survey (8001; Wessex Archaeology 2017, Phase 3). The anomaly is approximately 4m in diameter, located south of Winterbourne Stoke Copse-Clump, north of the proposed western approach cutting. The hengiform enclosure is located on the northern slope of a dry valley c. 38m north of the proposed approach cutting and c. 36m south of the existing course of the A303.”</i>
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 6.10 Paragraph 6.8.18	Incorrect place name	Delete “Winterbourne Stoke <u>Copse</u> ” and replace with “Winterbourne Stoke <u>Clump</u> ” as shown below... “The latter survey technique has confirmed the results of the magnetic surveys undertaken within SW1 and allowed additional examination of magnetic anomalies; these include a small ‘hengiform’ monument approximately 4m in diameter, located south of Winterbourne Stoke Copse Clump , north of the proposed western approach cutting outside the Scheme construction footprint.”
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 6.15 Paragraph 6.15.23	Missing words in paragraph.	Amend paragraph as shown below... “The policy includes requirements that <i>lighting is designed to minimise</i> light pollution and sky glow, <i>as it</i> could adversely affect the Attributes of the OUV of the Stonehenge WHS (Simmonds and Thomas 2015, 158).”
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 7.4 Paragraph 7.4.1 & 7.4.2 (p.530)	First two paragraphs contain superseded material.	Amend paragraphs 7.4.1 and 7.4.2 as shown below: “7.4.1 The A303 will pass through a bored tunnel, of at least 2.9km in length, to reduce its impact on the WHS. The improvement will also include a bypass of the village of Winterbourne Stoke beyond the WHS to the west. 7.4.1 Objectives for the Scheme have been formulated both to address identified problems and to take advantage of the opportunities that new

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text		
				<p>infrastructure would provide. The objectives are defined by the Department for Transport (“DfT”): 7.4.2 The four principal objectives for the Scheme, the CSRs, are:</p> <ul style="list-style-type: none"> • Transport: To create a high-quality reliable route between the South East and the South West that meets the future needs of traffic. • Economic growth: to enable growth in jobs and housing by providing a free flowing and reliable connection between the South East and the South West. • Cultural heritage: To help conserve and enhance the World Heritage Site and to make it easier to reach and explore. • Environment and community: To improve biodiversity and provide a positive legacy for nearby communities. <p>—</p> <p>7.4.2 The objectives would be achieved by providing a high quality, two-lane dual carriageway on the A303 trunk road between Amesbury and Berwick Down in Wiltshire. The Scheme would resolve traffic problems and, at the same time, protect and enhance the Stonehenge, Avebury and Associated Sites World Heritage Site (“WHS”). The Scheme would be approximately 8 miles (13km) long and comprise the following key components:</p> <ol style="list-style-type: none"> a) A northern bypass of Winterbourne Stoke with a viaduct over the River Till valley; b) A new junction between the A303 and A360 to the west of and outside the WHS, replacing the existing Longbarrow roundabout; c) A twin-bore tunnel approximately 2 miles (3.3km) long, past Stonehenge; and d) A new junction between the A303 and A345 at the existing Countess roundabout.” 		
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 14. Glossary of terms used (p.676)	Incorrect paragraph reference in definition of “Authenticity”.	<p>Amend paragraph reference as shown below...</p> <table border="1" data-bbox="1010 1161 2190 1385"> <tr> <td data-bbox="1010 1161 1207 1385">Authenticity</td> <td data-bbox="1207 1161 2190 1385">The ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful. Knowledge and understanding of these sources of information, in relation to original and subsequent characteristics of the cultural heritage, and their meaning, are the requisite bases for assessing all aspects of authenticity.</td> </tr> </table>	Authenticity	The ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful. Knowledge and understanding of these sources of information, in relation to original and subsequent characteristics of the cultural heritage, and their meaning, are the requisite bases for assessing all aspects of authenticity.
Authenticity	The ability to understand the value attributed to the heritage depends on the degree to which information sources about this value may be understood as credible or truthful. Knowledge and understanding of these sources of information, in relation to original and subsequent characteristics of the cultural heritage, and their meaning, are the requisite bases for assessing all aspects of authenticity.					

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				(Paragraph 80 82, Operational Guidelines for Implementation of the World Heritage Convention, UNESCO, 2017)
APP-195	Appendix 6.1 - Heritage Impact Assessment	Section 15. Abbreviations (p. 694)	Incorrect abbreviation description for HMAG	Delete “Management” from A303 Heritage Management Advisory Group” and replace with “Monitoring” as shown below... “HMAG A303 Heritage Management Monitoring and Advisory Group”
APP-195	Appendix 6.1 - Heritage Impact Assessment	Paragraph 7.4.3	Typo in cited text of 2017 TAR: ‘... The strategic route will be redirected so as to reduce its site and sound impacts on the WHS.’	Delete “site” and replace with “sight” as per the below amended sentence... “The strategic route will be redirected so as to reduce its site sight and sound impacts on the WHS.”
APP-212	Appendix 6.3 – Archaeological Gazetteer	Table 2.1	UID 2041 – Name location	In row 2041 delete “Linear, Longbarrow Crossroads” in the 3 rd column and replace with “Linear, <u>south of High Down</u> ”.
APP-212	Appendix 6.3 – Archaeological Gazetteer	Table 2.1	UID 2044 - Name location	In row 2044 delete “Pit, <u>Longbarrow Crossroads</u> ” in the 3 rd column and replace with “Pit, <u>south of High Down</u> ”

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
APP-212	Appendix 6.3 – Archaeological Gazetteer	Table 2.1	UID 2080 – Incorrect value attributed	In row 2080, delete “Unknown” from the ‘Value’ column and replace with “ <u>Medium</u> ”.
APP-218	Appendix 6.9 - Cultural Setting Assessment	Paragraph 3.4.9	Error in para 3.4.9	Delete “Till” and replace with “Avon” as shown below: <i>“However, even in this location the natural landform, rising to the north from the River Till Avon, successfully screens the area and its assets from the Scheme so that there would be no impact.”</i>
APP-230	Appendix 7.10 – Arboricultural Impact Assessment	[Executive Summary]	Error in text	The text should be amended as shown below... The scheme will require the full removal 178 191 tree features (moderate and low quality trees) and the partial removal of 13 15 tree features (moderate and low quality). No high quality trees are to be removed or are at risk of removal. Of the trees and tree groups to be removed, 43 45 individual trees and full tree groups are of moderate quality (Category B) and 135 142 individual trees and full tree groups are of low quality (Category C).
APP-230	Appendix 7.10 – Arboricultural Impact Assessment	Paragraph 9.1.1	Error in text	The text should be amended as shown below... The scheme will require the full removal 182 187 tree features and the partial removal of 13 15 tree groups. 9.1.2 No high quality trees are to be removed or are at risk of removal. Of the trees to be removed in full, 43 45 are of moderate quality (Category B) and 135 142 are of low quality (Category C). Of the tree groups to be removed in part, five are of moderate quality and eight are of low quality.

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text																						
APP-230	Appendix 7.10 – Arboricultural Impact Assessment	Table 7.10.2.1	Error in table	<p>The “works to facilitate the proposed scheme” column is incorrect for the trees identified below, and should be updated as shown:</p> <table border="1"> <thead> <tr> <th>Tree ID</th> <th>Works to Facilitate the Proposed Scheme</th> </tr> </thead> <tbody> <tr> <td>G22</td> <td>Fell</td> </tr> <tr> <td>G296</td> <td>Fell</td> </tr> <tr> <td>G874</td> <td>Fell in part</td> </tr> <tr> <td>G1002</td> <td>Fell</td> </tr> <tr> <td>T1004</td> <td>Fell</td> </tr> <tr> <td>T1005</td> <td>Fell</td> </tr> <tr> <td>T1006</td> <td>Fell</td> </tr> <tr> <td>T1007</td> <td>Fell</td> </tr> <tr> <td>G1019</td> <td>Fell</td> </tr> <tr> <td>1098</td> <td>Fell in part</td> </tr> </tbody> </table>	Tree ID	Works to Facilitate the Proposed Scheme	G22	Fell	G296	Fell	G874	Fell in part	G1002	Fell	T1004	Fell	T1005	Fell	T1006	Fell	T1007	Fell	G1019	Fell	1098	Fell in part
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APP-244 and APP-246	Appendix 8.7A and Appendix 8.9B	N/A	Covers on Reports	<p>[APP-244] Environmental Statement Appendix 8.7B Aquatic Macrophyte Survey River Till – contains [APP-247] Appendix 8.9B Aquatic macro-invertebrate survey and</p> <p>[APP-246] Environmental Statement Appendix 8.9A Aquatic Macroinvertebrate Survey River Avon – contains [APP-243] Appendix 8.7A Aquatic Macrophyte Survey River Avon</p> <p>The correct reports are provided within Appendix B of this Errata Report.</p>																						
APP-266	Appendix 8.25 Habitat Regulations Assessment	Appendix D (in Appendix A)	Fig 1. Map of Southern England Showing	Figure 1 Map of Southern England Showing Location of Bridge Sampling Sites is now provided, see Appendix C of this Report.																						

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
	(HRA): Statement to Inform Appropriate Assessment		Location of Bridge Sampling Sites - the map is not included.	
APP-280	Appendix 11.2 - Water Framework Directive Compliance Assessment	Section 7.2 Paragraph 7.2.5	An assessment of the potential impact of non-native species within the River SAC (which includes the River Avon and River Till) as a result of the Scheme was undertaken as part of the Habitats Regulations Assessment but this was not referred to within the WFD Compliance	New paragraph to be added after the existing paragraph 7.2.3: <i>“The spread of non-native/invasive species was considered as part of the Habitat Regulations Assessment screening assessment for the River Avon SAC (which includes the River Avon and River Till) as outlined in Table 3.1 of Appendix 8.24 - Habitat Regulations Assessment (HRA) Likely Significant Effects Report of the Environmental Statement (APP-265). This assessment concluded that there would be no likely significant effect as there are no invasive species present in the section of the River Till SAC where works will take place, the contractor will implement control measures as necessary to prevent the introduction or spread of invasive species in order to comply with the Wildlife & Countryside Act 1981 and the Scheme will not create changes to land management.”</i>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
			Assessment.	
APP-282	Appendix 11.4 Groundwater Risk Assessment Annex 1 Numerical Model Report	Page 17, 18 and 20	Figure Numbering error.	The numbering for the below figures should be updated as shown below: Page 17 “Figure 3.47 Flow hydrograph for Avon at Amesbury” Page 18 “Figure 4.2 3.8 Flow hydrograph for Wyllye at South Newton” Page 20 “Figure 4.3 3.9 Elevations of Interest – water levels, flow horizons, tunnel and retaining walls”
APP-294	Case for the Scheme	Section 6.4 Paragraph 6.4.3	Reference to agricultural land is incorrect and not consistent with the Environmental Statement, there is too little focus on BMV.	The first sentence of paragraph 6.4.3 of the original document should be deleted and amended as shown below... <i>“6.4.3 The agricultural land within the alignment of the Scheme is mapped at a large-scale under the Agricultural Land Classification (“ALC”) system as mainly Class 3 (good to moderate) with small areas of Grade 2 and Grade 4 land. Agricultural land within the alignment of the Scheme is mapped at a large-scale under the Agricultural Land Classification (ALC) system in accordance with the MAFF ALC guidelines. The extent and distribution of the different ALC grades and subgrades is shown on Environmental Statement Figure 13.3 (document reference 6.1) [APP-179] and set out in Table 13.15 of Environmental Statement Chapter 13 (document reference 6.1) [APP-051]. The majority of the agricultural land affected (90%) is BMV land in Subgrade 3a, Grade 2, and Grade 1. The remaining agricultural land (10%) is of moderate quality in Subgrade 3b. The majority of the land is in arable use, though some alongside the River Till and around the major archaeological monuments is permanent grassland. Small areas of woodland are scattered throughout the landscape, some of which contain stands of coniferous trees.</i>
APP-294	Case for the Scheme	Section 6.5 Paragraph 6.5.1	Number of non-designated ecology sites	The number of non-statutory sites listed in paragraph 6.5.1 of the original document, “fifteen”, should be deleted and replaced with “eight”. <i>“6.5.1 There are ten statutory designated sites within the Order limits and fifteen eight non-</i>

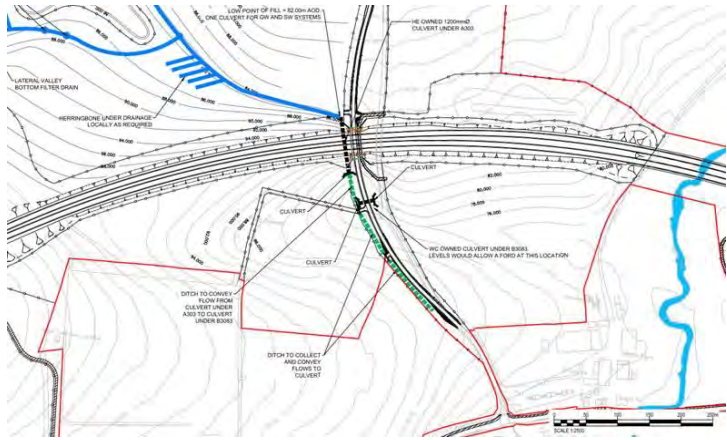
Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
			referenced in the CftS is incorrect and inconsistent with the Environmental Statement.	<i>statutory designated ecological sites within 500m of the Order limits. Full details of ecological designations are provided in ES (document reference 6.1)."</i>
APP-294	Case for the Scheme	Section 6.6 Paragraph 6.6.1	Incorrect reference to the WHS in the context of UK Planning Policy	Amend the second sentence of paragraph 6.6.1 of the original document as shown below... <i>"6.6.1 The Scheme passes through the Stonehenge, Avebury and Associated Sites World Heritage Site ("WHS"). As well as a designated heritage asset under UK planning policy. The WHS is inscribed for its Outstanding Universal Value ("OUV") and is of international importance. It is afforded protection through the World Heritage Convention, the commitments of which are fulfilled in England through the statutory planning system, designation of specific assets within World Heritage properties and the development of WHS Management Plans. The Scheme passes through the Stonehenge element of the WHS between Longbarrow Crossroads, Winterbourne Stoke and Countess Roundabout, Amesbury."</i>
APP-294	Case for the Scheme	Section 6.8 Paragraph 6.8.1	Incomplete reference to River Till.	Amend paragraph 6.8.1 as shown below... <i>"6.8.1 The River Avon is a classified Water Framework Directive (WFD) surface water body, is designated as a SAC and classed as a main river. The River Till is designated as a Main River and in its upper reaches north of Berwick St James it flows as a winterbourne on an intermittent basis. The River Till is designated as a SSSI, which forms part of the River Avon SAC, and classed as a main river. In its upper reaches, north of Berwick St James, it flows as a winterbourne on an intermittent basis."</i>
APP-294	Case for the Scheme	Section 6.8 Paragraph 6.8.3	Number of source protection zones (SPZs) referenced in	The number of source protection zones (SPZs) listed in paragraph 6.8.3 of the original document, "eight", should be deleted and replaced with "five". as shown below: <i>"6.8.3 There are eight five SPZs for public drinking water supply abstractions within the Road Drainage and Water Environment study area set out in Chapter 11 of the ES (document</i>

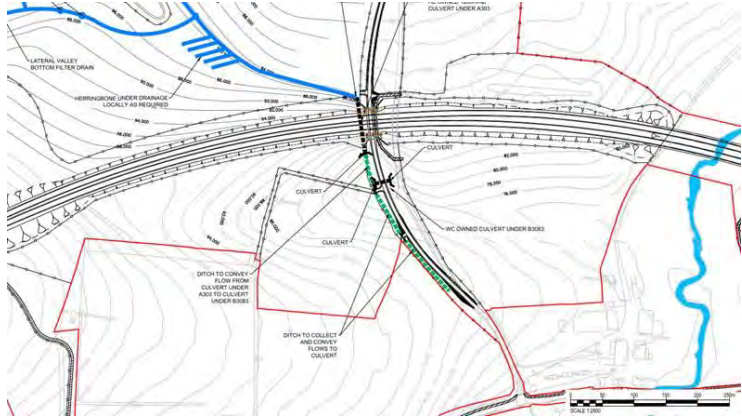
Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
			the CftS is incorrect and inconsistent with the Environmental Statement.	<i>reference 6.2, Figure 11.1). There is one SPZ located north of Amesbury at Durrington, where the SPZ1 lies partially within the Order Limits. The eastern most point of the proposed site boundary intersects the SPZ3 (outer catchment) of an abstraction south of Amesbury, near Little Durnford."</i>
APP-294	Case for the Scheme	Table 5 (para 5.195)	Error in abbreviations	The abbreviations STP and SLPP should be added to the abbreviation list: STP refers to the "Slurry Treatment Plant". SLPP refers to the "Segment Lining Production Plant".
APP-295	Design and Access Statement	Section 6.2 Paragraph 6.2.3 bullet d)	Incorrect description of contraflow working.	Add "overnight" to bullet d) as shown below... <i>"d) Vehicle cross-overs provided on tunnel approaches to enable contraflow working when one tunnel bore is closed during planned overnight maintenance."</i>
APP-297	Transport Assessment	Section 3.2. and 3.4 Paragraphs 3.2.4, 3.2.7 and 3.4.2.	Incorrect minimum headroom value.	Delete reference to "5.35m" within paras 3.2.4, 3.2.7 and 3.4.2 and replace with "5.03m" as per the below.... <i>"3.2.4 Local access from Winterbourne Stoke, northwards towards Shrewton, would be provided by the B3083. This access would be maintained by the provision of a single span bridge to carry the new A303 over the B3083. The proposed new bridge would be located approximately 50m to the west of the existing B3083. This location would necessitate the realignment of some 400m of the B3083 but would enable the B3083 to be kept open to traffic throughout the construction period other than for discrete periods to allow short duration specific activities to be undertaken (e.g. construction of tie-ins etc.). The clear span of the bridge would accommodate both the re-aligned B3083 and a segregated verge on the east side to allow cattle movements and equestrian use across the new alignment. The minimum headroom would be 5.35m 5.03m."</i> <i>"3.2.7 Continuing to the east, the Scheme would cross the line of the existing A303 approximately 700m west of the existing A360 Longbarrow Roundabout. A new grade</i>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
				<p>separated junction with the A360 is proposed to the west of the WHS boundary. This junction, known as the Longbarrow junction, would accommodate free-flowing traffic movements between the A360 and the A303. The junction would consist of two roundabouts connected by a short length of dual carriageway, carried over the A303 on a new green bridge with earth bunds on each side, to help mitigate visual impact and to provide ecological connectivity. The structure would be a single span bridge, with headroom of at least 5.35m 5.03m. The roundabouts would be set below existing ground level.”</p> <p>“3.4.2 A new flyover above the existing roundabout would separate traffic going eastwest along the A303 from traffic going north-south along the A345 Countess Road, with slip roads accommodating traffic movements between the two roads. The new flyover would include two single span bridges that would accommodate the existing roundabout traffic lanes. The minimum headroom of the bridges would be 5.35m 5.03m.”</p>
APP-297 and APP-301	Transport Assessment, and also in the Combined Modelling and Appraisal Report – Appendix C: Transport Forecasting Package	Table 9.3 in the Transport Assessment Table 7.1 in the Combined Modelling and Appraisal Report – Appendix C: Transport Forecasting Package	Error in Table	<p>Table 9.3 [APP-297] mis-reported that the AADT traffic flow at Netton is forecast to increase from 1,700 to 1,900 (13%) during Phase 1 of the construction scenario, rather than from 1,700 to 2,100 (21%).</p> <p>As explained in the Applicants response to written questions Tr.1.41 [REP2-036] the level of flow increase at Netton is not sufficient to cause congestion and accordingly is assessed not to be significant.</p> <p>Table 7.1 of the Combined Modelling and Appraisal Report – Appendix C [APP-301] is similarly corrected below:</p>

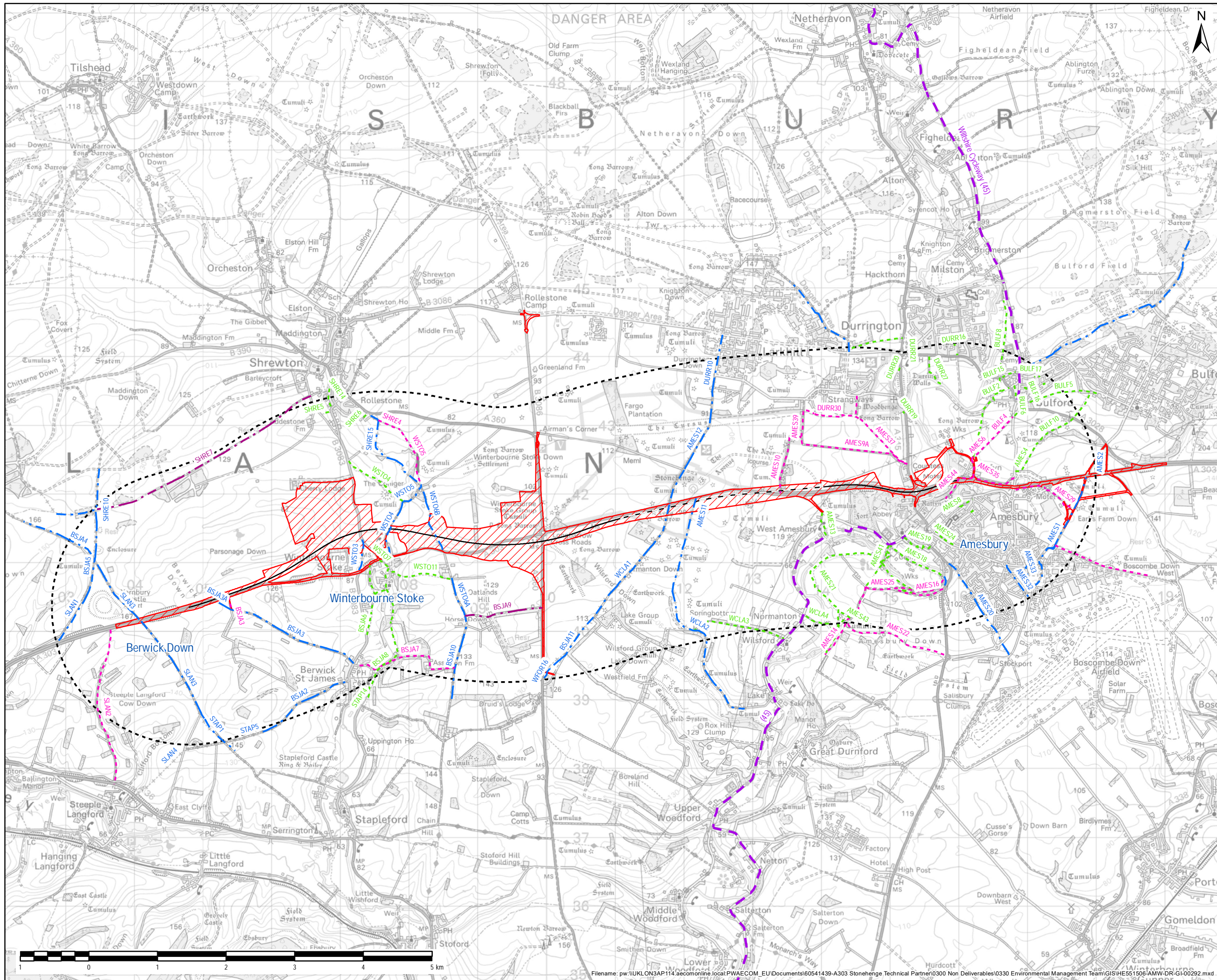
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APP-301	Combined Modelling and Appraisal Report – Appendix C:	Paragraph 5.4.12 and Table 5-16	Error in paragraph 5.4.12 and table 5-16	<p>Paragraph 5.4.12 of the Combined Modelling and Appraisal Report – Appendix C [APP-301] corrected below:</p> <p>Delete reference to 1.1% and replace with 1% in paragraph 5.4.12 as below: “The 2026 screenline analysis shows a flow increase of 1.1% 1% with the scheme in place compared to</p>																																																																					

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text																																																																					
	Transport Forecasting Package			<p><i>the without scheme scenario.</i></p> <p>Corrected Table 5-16 [APP-301] as below.</p> <table border="1"> <thead> <tr> <th></th> <th>Name</th> <th>2017</th> <th>2026 without scheme</th> <th>2026 with scheme</th> </tr> </thead> <tbody> <tr> <td rowspan="5">North of A303</td> <td>M4</td> <td>64,200</td> <td>81,500</td> <td>80,600</td> </tr> <tr> <td>A4</td> <td>10,000</td> <td>11,300</td> <td>11,200</td> </tr> <tr> <td>A342</td> <td>7,300</td> <td>8,600</td> <td>8,500</td> </tr> <tr> <td>N of A303</td> <td>2,900</td> <td>3,800</td> <td>3,800</td> </tr> <tr> <td>Packway</td> <td>4,800</td> <td>6,900</td> <td>4,100</td> </tr> <tr> <td>A303</td> <td>A303</td> <td>25,500</td> <td>29,400</td> <td>37,200</td> </tr> <tr> <td rowspan="7">South of A303</td> <td>S of A303</td> <td>6,500</td> <td>7,600</td> <td>7,600</td> </tr> <tr> <td>S of A303</td> <td>3,100</td> <td>3,000</td> <td>3,000</td> </tr> <tr> <td>Netton</td> <td>1,400</td> <td>1,700</td> <td>1,500</td> </tr> <tr> <td>S of A303</td> <td>14,400 13,600</td> <td>18,300 17,400</td> <td>18,400 17,400</td> </tr> <tr> <td>A338</td> <td>6,000 6,400</td> <td>8,000 8,300</td> <td>8,100 8,300</td> </tr> <tr> <td>A36</td> <td>17,500 16,200</td> <td>19,300 18,000</td> <td>19,200 17,800</td> </tr> <tr> <td>A30</td> <td>11,200</td> <td>12,300</td> <td>11,600</td> </tr> <tr> <td>A31</td> <td>60,200</td> <td>70,100</td> <td>70,000</td> </tr> <tr> <td>Total</td> <td></td> <td>235,000 233,300</td> <td>281,800 279,900</td> <td>284,800 282,600</td> </tr> </tbody> </table>		Name	2017	2026 without scheme	2026 with scheme	North of A303	M4	64,200	81,500	80,600	A4	10,000	11,300	11,200	A342	7,300	8,600	8,500	N of A303	2,900	3,800	3,800	Packway	4,800	6,900	4,100	A303	A303	25,500	29,400	37,200	South of A303	S of A303	6,500	7,600	7,600	S of A303	3,100	3,000	3,000	Netton	1,400	1,700	1,500	S of A303	14,400 13,600	18,300 17,400	18,400 17,400	A338	6,000 6,400	8,000 8,300	8,100 8,300	A36	17,500 16,200	19,300 18,000	19,200 17,800	A30	11,200	12,300	11,600	A31	60,200	70,100	70,000	Total		235,000 233,300	281,800 279,900	284,800 282,600
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REP3-008	Deadline 3 Submission – 6.3 Environmental Statement Appendix 11.5 Level 3 Flood Risk Assessment	Para 8.3.2	The para states “...events expected to occur with 1% annual probability...” whereas it should say events with 1% +40% climate	<p>The text should be amended as shown below:</p> <p>Any scheme elements which will result in an increase in impermeable area have design mitigation incorporated. The road is designed to minimise the risk of surface water flooding with attenuation features to detain runoff from all events expected to occur with a frequency up to with 1% annual exceedance probability plus 40% climate change allowance or more frequently. Further details on the drainage strategy for the proposed scheme are included in the A303 Amesbury to Berwick Down Environmental Statement Appendix 11.3.</p>																																																																					

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
			change scenario.	
REP3-008	Deadline 3 Submission – 6.3 Environmental Statement Appendix 11.5 Level 3 Flood Risk Assessment	Fig 3.2 of Annex 1A	Figure 3.2 has a box describing a ford crossing of the B3083. There is no formal ford at this location and mention of it needs removing.	<p>Figure 3.2 of Annex 1A requires a correction relating to the text associated with the mention of the ford crossing. There is no ford crossing at this location.</p> <p>‘Before’ extract with incorrect text “levels would allow a ford at this location”:</p>  <p>The technical drawing shows a road crossing a watercourse. Key features include: <ul style="list-style-type: none"> LOW POINT OF FILL - 82.0m AOD ONE CULVERT FOR ON AND OFF SYSTEMS HEAVY DRAIN 120mm Ø CULVERT UNDER A&E LATERAL VALLET BOTTOM FILTER DRAIN HERRINGBONE UNDER DRAINAGE LOCALLY ACQUIRED CULVERT NO OWNED CULVERT UNDER B&S&S LEVELS WOULD ALLOW A FORD AT THIS LOCATION DITCH TO COLLECT AND CONVEY FLOW FROM CULVERT UNDER AND TO CULVERT UNDER B&S&S DITCH TO COLLECT AND CONVEY FLOW TO CULVERT SCALE 1:250 </p>

Document no.	Document name	Section and Paragraph Reference	Nature of Erratum and Explanation	Replacement Text
				<p>'After' extract without text:</p>  <p>The technical drawing is a plan view of a drainage system overlaid on a contour map. It features several key elements: <ul style="list-style-type: none"> LATERAL VALLEY BOTTOM FILTER DRAIN: A blue line representing a drainage channel at the top left. HERRINGTONS UNDER DRAINAGE: A series of parallel lines representing a drainage structure, with a note 'LOCALLY AS REQUIRED'. CULVERTS: Multiple structures labeled 'CULVERT' and 'CULVERT UNDER ROAD' crossing various features. DITCHES: Several ditches are shown, with labels such as 'DITCH TO COLLECT FLOW FROM CULVERT UNDER ROAD TO CULVERT UNDER ROAD' and 'DITCH TO COLLECT AND CONVEY FLOW TO CULVERT'. CONTOUR MAP: The background consists of grey contour lines indicating elevation. SCALE BAR: A scale bar is located at the bottom right of the drawing. </p>

Appendix A - Corrected Figure 13.2 and Figure 13.3



NOTES / LEGEND

- Indicative centreline
- - - Proposed tunnel
- ▨ Proposed scheme boundary
- - - - - Indicative centreline 2km buffer
- Public Right of Way
- Footpath
- - - - - Bridleway
- Byway Open to all traffic
- - - - - Restricted Byway
- National Cycle Route

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Revision Details	By	Date	Suffix
	Check		

Purpose of issue
FINAL

Client
Highways England

Working on behalf of
highways england

Project Title
A303 AMESBURY TO BERWICK DOWN

Drawing Title
FIGURE 13.2 EXISTING PUBLIC RIGHTS OF WAY

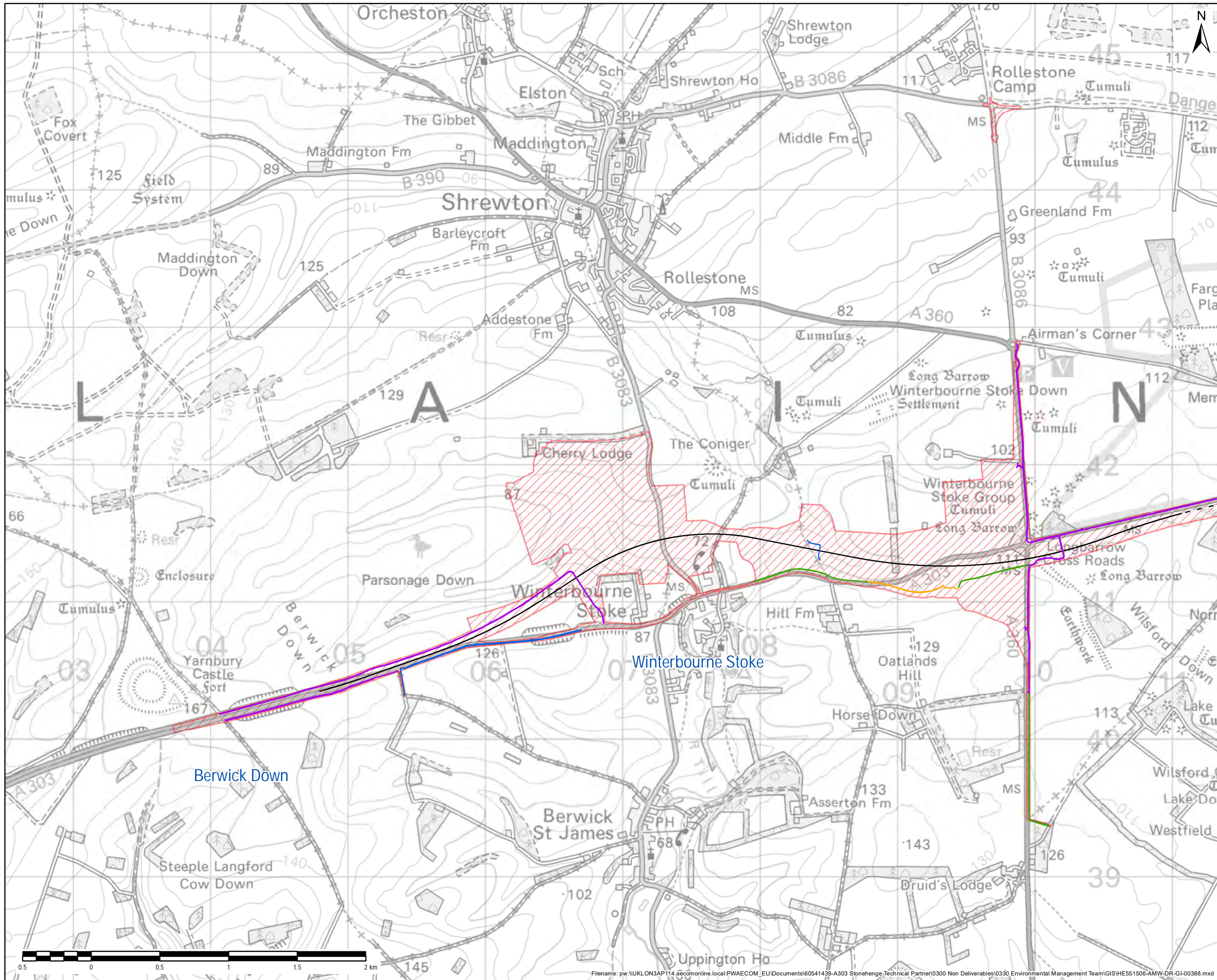
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Type		Role	Number	



- NOTES / LEGEND
- Indicative centreline
 - Proposed tunnel
 - Proposed shared cycleway
 - Proposed byway open to all traffic
 - Proposed bridleway
 - Proposed restricted byway
 - Proposed scheme boundary

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Revision Details	By	Date	Suffix

Purpose of issue: FINAL

Client: Highways England
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Project Title: A303 AMESBURY TO BERWICK DOWN

Drawing Title: FIGURE 13.3A PROPOSED PUBLIC RIGHTS OF WAY

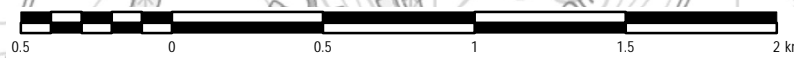
Designed	Drawn	Checked	Approved	Date
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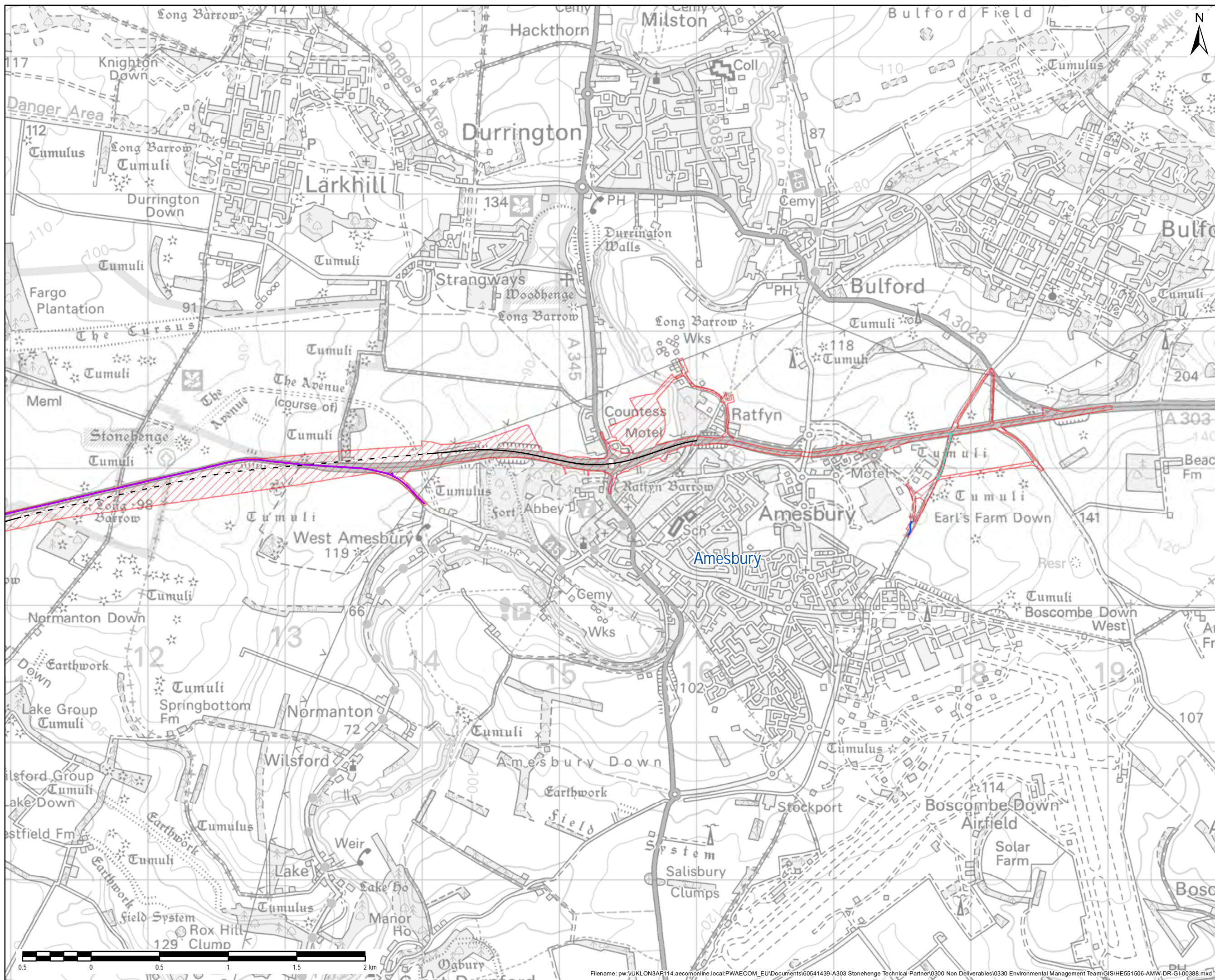
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SCHEME WIDE		DR	GI	00388
Location	Type	Role	Number	





- NOTES / LEGEND
- Indicative centreline
 - Proposed tunnel
 - Proposed byway open to all traffic
 - Proposed footpath
 - Proposed restricted byway
 - Proposed scheme boundary

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Project Title: A303 AMESBURY TO BERWICK DOWN

Drawing Title: FIGURE 13.3B PROPOSED PUBLIC RIGHTS OF WAY

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HE551506	AMW	GEN	02	
SCHEME WIDE		DR	GI	00388
Location	Type	Role	Number	

Appendix B - Corrected Appendix 8.7B and Appendix 8.9A

It has come to the Applicant's attention that two appendices were submitted as part of the Environmental Statement (ES) [PINS ref: APP-046] accompanying the application which incorrectly duplicated other appendices. The affected appendices are 8.7B (Aquatic macrophyte survey - River Till) [PINS ref: APP-244] and 8.9A (Aquatic macro-invertebrate survey - River Avon) [PINS ref: APP-246]. The documents with these references contain the same documents submitted, correctly, as appendices 8.9B [PINS ref: APP-247] and 8.7A [PINS ref: APP-243] respectively.

As such, corrected versions of appendices 8.7B and 8.9A of the Environmental Statement are attached. [These are marked as 'Corrected version – August 2019' in each case on their covers, with the relevant date updated.] The omission of these documents from the ES was an administrative error only.

It should be noted that the attached documents do not alter the information reported in Chapter 8 of the ES, rather they provide the detail behind the baseline, survey results, approach to mitigation and assessment of effects already reported in the ES. The surveys contained in the appendices were reflected in the ES and were taken into account in the identification of the baseline and approach to mitigation and in the assessment of likely significant effects in the ES. Paragraphs 8.5.9 to 8.5.11 of the ES summarise the survey methods employed and section 8.6 of the ES summarises the results of the surveys and the ecological baseline for the study area. Section 8.8 of the ES describes the approach to mitigation of ecological impacts and section 8.9 of the ES describes the assessment of likely significant effects. These sections were all informed by the information detailed in the attached documents.

As such, the submission of the attached documents simply corrects the administrative error. The information reported in the ES was informed by the survey results detailed in the attached documents. In addition, the attached documents were submitted to the relevant statutory bodies, namely Natural England, Environment Agency, Wiltshire Council, in February 2018 for the purposes of discussing the suitability of the baseline information proposed to be used for the relevant assessments. This information was accepted by these bodies as suitable for those purposes.

A303 Amesbury to Berwick Down

TR010025

6.3 Environmental Statement Appendices

Appendix 8.7B Aquatic macrophyte survey River Till

Corrected Version - August 2019

APFP Regulation 5(2)(a)

Planning Act 2008

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

October 2018



Subject:	River Till Aquatic Macrophyte Surveys		
Date:	21 June 2017	Date amended:	26 June 2017
Reference:	HE551506-AA-EWE-SWI-SU-YE-000007 P01		
Prepared by:	Ellie Derbyshire		

1 Introduction

1.1 Overview

1.1.1 Aquatic macrophyte surveys were undertaken at six sites on the River Till, to provide a baseline of the existing health and structure of the communities present. These surveys will inform the environmental assessment and any design mitigation/compensation that may be required, as well as the baseline for future construction monitoring.

1.1.2 Surveys were undertaken along six 500m reaches as shown in Figure 1-1. Upstream and downstream grid references (NGR) for each survey reach are provided in Table 1-1. For each of the Winterbourne Stoke A303 bypass options (northern and southern) the surveys were contiguous, extending 500m upstream of the proposed crossing location, and for 1km downstream.

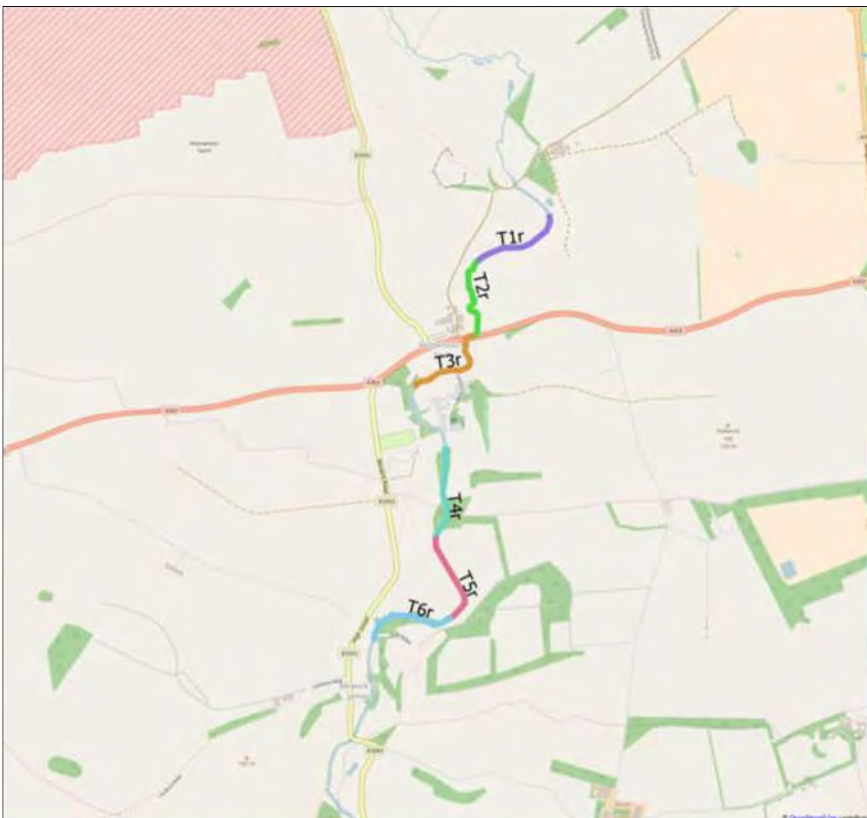


Figure 1-1 River Till macrophyte survey locations

Table 1-1 – Survey reach NGRs and associated bypass option

Reach	Upstream NGR	Downstream NGR	Associated bypass option
T1r	SU 08202 41752	SU 07827 41506	Northern bypass. Proposed crossing at boundary of T1r and T2r.
T2r	SU 07827 41506	SU 07807 41109	
T3r	SU 07807 41109	SU 07518 40865	
T4r	SU 07649 40501	SU 07642 40031	Southern bypass. Proposed crossing at boundary of T4r and T5r.
T5r	SU 07642 40031	SU 07726 39588	
T6r	SU 07726 39588	SU 07272 39518	

2 Methods

2.1 Field survey

2.1.1 Surveys were undertaken by APEM between the 23rd and 25th May 2017.

2.1.2 Two survey methods were applied to provide a range of information regarding the macrophyte communities present:

- The Holmes method for surveying macrophytes and determining river community type as described in Life in UK Rivers¹, applied at a 500m reach scale.
- The LEAFPACS method as described in the UK TAG guidance for Water Framework Directive (WFD) monitoring², applied at a 100m reach scale.

2.1.3 Full details can be found in the relevant references. The two methods are briefly described below.

2.2 Holmes method

2.2.1 The Holmes method records macrophytes from within the watercourse (plants that are rarely out of water) and on the immediate bankside (plants that are submerged except by the highest of flows) over a 500m reach. The survey records estimated relative abundance and percentage cover of species from a predetermined check-list. Other species of interest (not on the checklist) are also noted.

2.2.2 The aim of this survey method is to obtain a comprehensive list of species presence and abundance in order to characterise the vegetation and health of the watercourse. Six of these surveys were undertaken on the River Till as shown in Figure 1-1. The extent of these surveys is the same as those used for the River Habitat Survey (RHS), which provides detailed habitat descriptions for each 500m reach.

¹ Life in UK Rivers (2003). Monitoring Watercourses Characterised by *Ranunculion fluitantis* and *Callitricho-Batrachion* Vegetation Communities. Conserving Natura 2000 Rivers Monitoring Series No. 11, English Nature, Peterborough.

² UKTAG (2014) Guide to Macrophytes in Rivers River LEAFPACS2. Available at: <http://www.wfduk.org/sites/default/files/Media/Characterisation%20of%20the%20water%20environment/Biological%20Method%20Statements/River%20Macrophytes%20UKTAG%20Method%20Statement.pdf>

2.3 LEAFPACS method

2.3.1 The LEAFPACS method involves a survey of the macrophytes within the watercourse (up to the height of the bank that would typically be submerged for more than 50% of the year) over a 100m reach. The survey records the presence and percentage of the river channel covered by each macrophyte taxa from a predetermined list. One 100m LEAFPACS survey was conducted within a representative section of each of the six 500m Holmes method survey reaches.

2.3.2 Physical attributes of the channel are also recorded for each 100m survey, including: channel width, water depth and clarity, substrate composition, flow type and shading.

2.3.3 The LEAFPACS method has been designed for the Water Framework Directive (WFD) to reflect the impact of nutrient enrichment on the WFD water body status. It may also be sensitive to other pressures such as alterations to river flow and morphology. A number of metrics are calculated based on the taxa recorded:

- River macrophyte nutrient index (RMNI): The RMNI is designed to categorise a macrophyte community's preference to nutrient levels. Scores range from 1 to 10 with scores of 1 representing plant communities with preference for very low levels of nutrients and 10 representing communities with a preference for (or tolerance of) enriched conditions.
- River macrophyte hydraulic index (RMHI)³: The RMHI describes a plant community's preference for flow conditions. Scores range from 1 to 10 with scores of 10 indicating a preference for very slow flow and scores of 1 indicating a preference for very fast flows.
- Number of aquatic taxa (NTAXA): A diversity score indicating the number of truly aquatic macrophyte taxa recorded from the field survey.
- Number of aquatic plant functional groups (NFG): A diversity score indicating the number of functional macrophyte groups within the plant community, from a predefined list of 24 different functional groups. Only truly aquatic taxa are included.
- Cover of green filamentous algae (ALG): The percentage cover of green filamentous algae over the whole of the surveyed section of the river.

3 Summary results

3.1 Macrophyte taxa

3.1.1 Table 3-1 summaries the results from the 500m Holmes method surveys, showing which taxa were recorded at each site (r = river channel, b = bankside).

Table 3-1 – Taxa recorded from the Holmes method 500m surveys

Taxa	T1r	T2r	T3r	T4r	T5r	T6r	Comment
Algae							
<i>Batrachospermum</i> sp.		r		r			Only present at two sites, more than 5% cover

³ The RMHI is no longer used in the WFD assessment but is reported here to be used as a relative comparison between the survey sites within the same watercourse.

Taxa	T1r	T2r	T3r	T4r	T5r	T6r	Comment
<i>Cladophora</i> / <i>Rhizoclonium</i> agg.	r	r					More than 5% cover at site T2r, rare at site T1r
<i>Hildenbrandia rivularis</i>					r	r	Up to 5% cover at two sites
<i>Lemanea fluviatilis</i>	r						Rare at site T1r, less than 5% cover
Liverworts							
<i>Conocephalum conicum</i>				b		b	Rare at two sites
<i>Pellia epiphylla</i>						b	Rare at site T6r only
Mosses							
<i>Amblystegium fluviatile</i>	r						Site T1r only, less than 0.1% cover
<i>Fontinalis squamosa</i>	r	r	r	r	r	r	More than 5% cover at four sites, rare abundance at sites T4r and T6r
<i>Leptodictyum riparium</i>	r		r	r		b	Present at four sites, up to 5% cover
Herbs							
<i>Apium nodiflorum</i>	r	r	r		r	r	Up to 5% cover at four sites, more than 5% cover at T1r
<i>Berula erecta</i>					r	r	Present at two sites, up to 5% cover
<i>Caltha palustris</i>						r	Rare at T6r only
<i>Eupatorium cannabinum</i>						r	Rare at T6r only
<i>Filipendula ulmaria</i>					b		Rare at T5r only
<i>Mentha aquatica</i>	r	r	r	r	r	r	Frequent abundance at all sites, more than 5% cover at four
<i>Myosotis scorpioides</i>	r	r	r	r	r	r	Up to 5% cover at five sites, <0.1% at T6r
<i>Oenanthe crocata</i>			r	r / b	r / b	r	Present at four sites, more than 5% cover
<i>Petasites hybridus</i>			b				Up to 5% cover at site T3r only
<i>Ranunculus peltatus</i>	r	r	r		r		Present at four sites, rare at T5r, more than 5% cover at T1r and T2r
<i>Ranunculus penicillatus</i> ssp. <i>pseudofluitans</i>					r		Rare, up to 5% cover at T5r
<i>Rorippa nasturtium-aquaticum</i>	r		r				Frequent, up to 5% cover at two sites
<i>Scrophularia auriculata</i>						b	Rare, less than 0.1% cover at T6r
<i>Solanum dulcamara</i>			b	r		r	Rare at three sites, less than 5% cover
<i>Veronica anagallis-aquatica</i>	r	r	r	r			Frequent at four sites, up to 5% cover
<i>Veronica beccabunga</i>		r					Rare at T2r, less than 5% cover
Trees and shrubs							
<i>Salix</i> sp.		r	b	r / b		b	Abundant at three sites, frequent at T2r
Other Deciduous Trees and Shrubs		r	b	r / b		b	Abundant at three sites, frequent at T2r
Monocotyledons							
<i>Carex acutiformis</i>					b		Rare, up to 5% cover at T5r
<i>Glyceria fluitans</i>	r	r	r	r			Up to 5% cover at four sites

Taxa	T1r	T2r	T3r	T4r	T5r	T6r	Comment
<i>Glyceria maxima</i>		r	r	r	r	r	Rare at T6r, more than 5% cover elsewhere
<i>Iris pseudacorus</i>			r / b	r / b		r	Rare, up to 5% cover at three sites
<i>Lemna minor</i>	r	r	r	r		r	Up to 5% cover at four sites, rare at T6r
<i>Phalaris arundinacea</i>	r / b	r	r		r	r / b	More than 5% cover at T2r and T6r, less than 0.1% cover at T5r
<i>Sparganium erectum</i>					r	r	Rare, up to 5% cover at two sites
Total taxa recorded	14	15	18	15	14	21	

3.2 LEAFPACS assessment

3.2.1 Table 3-2 summarises the results of the LEAFPACS assessment and metric outputs for each site.

Table 3-2 – LEAFPACS results

	Northern bypass			Southern bypass		
	T1r	T2r	T3r	T4r	T5r	T6r
RMNI	6.67	6.87	6.72	6.20	6.95	6.91
RMHI	6.85	6.91	6.93	6.49	6.99	6.95
NTAXA	8.00	4.00	5.00	4.00	6.00	8.00
NFG	5.00	3.00	4.00	3.00	4.00	5.00
ALG	0.50	1.70	0.00	0.00	0.00	0.00
Total % cover	70	25	25	15	30	40
Survey WFD status (macrophytes) ⁴	High	Good	High	High	High	High

3.3 Physical habitat

3.3.1 A summary of physical attributes is provided below in Section 4, based on observations from the 100m LEAFPACS survey. The RHS report provides detailed physical descriptions and assessment of modification for each of the 500m survey reaches.

4 Site summaries

4.1 Survey site T1r

4.1.1 This most upstream reach is open channel with very sparse bankside scrub/bushes casting no shade onto the channel, reflected in the high total percentage cover. Adjacent land use is rough pasture. Water depth was recorded between 0.25m and 0.5m, with

⁴ The River LEAFPACS2 Classification Calculator was used to calculate expected values for each LEAFPACS2 metric, calculate the Ecological Quality Ratio from observed and reference values and provide a face value classification for each survey.

occasional deeper pools of up to 1m depth. Recorded width was between 1m and 5m with substrate comprised predominantly of silt/clay with smaller amounts of pebbles/gravel.

4.1.2 The 500m survey recorded 15 taxa dominated by *Apium nodiflorum*, with *Mentha aquatica*, *Myosotis scorpioides*, *Ranunculus peltatus*, *Rorippa nasturtium-aquaticum* as well as the moss *Fontinalis squamosa* occurring frequently. The detailed 100m survey recorded eight truly aquatic taxa (NTAXA) from five functional groups.

4.1.3 The RMNI of 6.67 indicates the macrophyte community is subject to some degree of nutrient enrichment. Filamentous algae was recorded during the LEAFPACS survey at 3%. *Fontinalis squamosa*, *Glyceria fluitans*, *Hygroamblystegium fluviatile* and *Lemanea fluviatilis* were all recorded at the site and all have relatively low individual RMNI being less than 6.0.

4.1.4 The RMHI shows that the flow conditions for this site are marginally faster than the sites downstream.

4.2 Survey site T2r

4.2.1 This reach is directly upstream of the A303 and downstream of site A1r. It is slightly more shaded than site A1r with sections of broken shade from bankside scrub and trees. Water depth was recorded as being no greater than 1.0m although there is an increase in deeper areas compared to T1r. Channel width was recorded between 5m and 10m and substrate composition was similar to site A1r, with silt/clay and pebbles/gravel in equal proportions.

4.2.2 The 500m survey recorded 15 taxa dominated by *Cladophora / Rhizoclonium* agg. and *Glyceria maxima*, with *Apium nodiflorum*, *Mentha aquatica*, *Myosotis scorpioides*, *Ranunculus peltatus*, *Veronica anagallis-aquatica*, *Glyceria fluitans*, *Lemna minor* and *Phalaris arundinacea* occurring frequently. However, the detailed 100m surveys recorded only four truly aquatic species from three functional groups. There is a reduction in the number of truly aquatic species, perhaps due to the domination of *Glyceria maxima*.

4.2.3 Overall macrophyte cover reduced from 75% in T1r to 25% in T2r, perhaps due to the increase in depth and shading from bankside vegetation.

4.2.4 Compared to site T1r, the RMNI shows a slight increase in nutrient enrichment at 6.87 with only two species; the algae *Batrachospermum* sp(p) and moss *Fontinalis squamosa*, with RMNI scores below 6. The increase in cover of filamentous algae compared to T1r, represented with an ALG score of 1.70 reflects the increase in nutrient enrichment.

4.2.5 The RMHI shows flow conditions at this site have decreased slightly from site T1r upstream, but slightly faster than the sites at the downstream extent of the surveys.

4.3 Survey site T3r

4.3.1 This reach is directly downstream of the A303. Tree lined banks provide dense marginal shading throughout the reach. Water depth remains the same as upstream sites, between 0.25m and 0.5m. Substrate is now dominated by pebbles and with gravels silt/clay (60/40 split).

Technical Note

A303 Amesbury to Berwick Down

4.3.2 The RHS notes this site as being subject to greater modification than the previous sites upstream. This site includes the A303 road bridge and banks on both sides have been modified for roads and housing.

4.3.3 The 500m survey recorded 18 taxa with 15 taxa recorded as being occasional or frequent. Of those *Mentha aquatica*, *Oenanthe crocata* and the moss *Fontinalis squamosa*, were recorded at greater than 5% coverage.

4.3.4 The detailed 100m survey recorded five truly aquatic taxa from four functional groups. Overall macrophyte cover remains as 25% due to the increase in bankside modifications and trees shading the watercourse.

4.3.5 The RMNI shows a slight decrease in nutrient enrichment at 6.72 compared to the site directly upstream (T2r) but is still lower than the sites at the downstream extent of the survey. Only two species recorded had RMNI scores below 6.0. Filamentous algae were not recorded at this site.

4.3.6 The RMHI is higher than both upstream sites, indicating slower flows moving downstream.

4.4 Survey site T4r

4.4.1 Tree lined banks provide dense marginal shading through much of the reach. Water depth was predominantly between 0.25m and 0.5m with some areas of deeper water reaching up to 1m. Channel width was between 1m and 5m and substrate was dominated by pebbles/gravels with approximately 10% silt.

4.4.2 The 500m survey recorded 15 taxa dominated by *Salix* sp. and other deciduous trees and shrubs. Of the other species, only *Mentha aquatica*, *Oenanthe crocata*, and *Glyceria maxima* recorded over 5% cover.

4.4.3 The detailed 100m survey recorded four truly aquatic taxa from three functional groups. Total macrophyte cover is the lowest recorded of all six sites on the River Till at just 15% due to the increased shading from dense bankside trees and hedgerows.

4.4.4 The RMNI is the lowest of all six sites from the River Till at 6.20 indicating the lowest level of nutrient enrichment. Only three species recorded had RMNI scores below 6.0. Filamentous algae were not recorded at this site.

4.4.5 RMHI is also the lowest at this site compared to others on the River Till indicating this site is subject to faster flows.

4.5 Survey site T5r

4.5.1 This reach consists of open channel with very sparse bankside scrub/bushes casting no shade onto the channel. The water depth recorded was no greater than 0.5m with the width between 1m and 5m. Substrate was dominated by pebbles/gravels with approximately 10% silt.

4.5.2 The 500m survey recorded 14 taxa with only *Oenanthe crocata*, *Glyceria maxima* and the algae *Hildenbrandia rivularis* recorded as abundant or dominant with greater than

5% cover. The moss *Fontinalis squamosa*, while recorded as occasional or frequent, was recorded at greater than 5% cover.

4.5.3 The detailed 100m survey recorded six truly aquatic taxa from four functional groups. Total macrophyte cover has increased from upstream sites to 30%, likely due to the decrease in bankside shading, although still not as high macrophyte cover as recorded at T1r.

4.5.4 The RMNI of 6.95 is the highest of the six sites surveyed indicating the highest level of nutrient enrichment with only one species recorded having an RMNI score below 6.0. Filamentous algae were not recorded at this site.

4.5.5 The RMHI of 6.99 is also the highest of the six sites surveyed indicating it's the slowest flowing section of the river surveyed.

4.6 Survey site T6r

4.6.1 Trees along the left-hand bank create dense shading of part of the channel. Width ranges between 1m and 5m with depths predominantly below 0.25m although there were some deeper areas of up to 0.5m. Substrate was primarily sand (60%) with pebbles/gravels (30%) and silt (10%).

4.6.2 The 500m survey recorded 21 taxa, greater than all other sites on the River Till. Plants recorded as abundant or dominant include *Oenanthe crocata*, *Phalaris arundinacea*, *Salix* sp., other deciduous trees and shrubs, and the algae *Hildenbrandia rivularis*.

4.6.3 The detailed 100m survey recorded eight truly aquatic taxa from five functional groups. Total macrophyte cover was recorded at 40%, in part due to the open right hand bank.

4.6.4 The RMNI score of 6.91 is lower than the upstream site T5r, with only one species recorded having an RMNI score below 6.0. However, it is higher than the other four sites indicating the two downstream sites have a higher level of nutrient enrichment.

4.6.5 The RMHI score of 6.95 is lower than the upstream site T5r, but is higher than the other four sites indicating reduced flows at the downstream sites.

Arup Atkins Joint Venture Approvals

Version	Role	Name	Signature	Date
P01	Author	Ellie Derbyshire		19 June 2017
	Checker	Ian Morrissey		26 June 2017
	Checker	Liz Brown		26 June 2017
	Approver	Andy Keen		26 June 2017

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6.3 Environmental Statement Appendices

Appendix 8.9A Aquatic macro-invertebrate survey
River Avon

Corrected Version - August 2019

APFP Regulation 5(2)(a)

Planning Act 2008

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

October 2018



Subject: River Avon Aquatic Macroinvertebrate Surveys

Date: 06 January 2017

Date amended: 16 August 2017

Reference: HE551506-AA-EWE-SWI-SU-YE-000002 P04

Prepared by: Naomi Lowden

1 Introduction

1.1 Overview

1.1.1 Aquatic macroinvertebrate surveys were undertaken at six sites on the River Avon, to provide a baseline of the existing health and structure of the communities present. These surveys will inform the environmental assessment and any design mitigation/compensation that may be required. The data will also provide a baseline for future construction monitoring.

1.1.2 Figure 1 shows the sections of the River Avon surveyed and locations from which macroinvertebrate samples were collected. A total river length of 3km was assessed: from 1km upstream of the A303 crossing (NGR SU15873 42176) to 2km downstream. The total length is split into 500m sections in order to complete a suite of ecological surveys. Within each 500m reach one representative sampling point was selected for macroinvertebrate survey (Table 1).

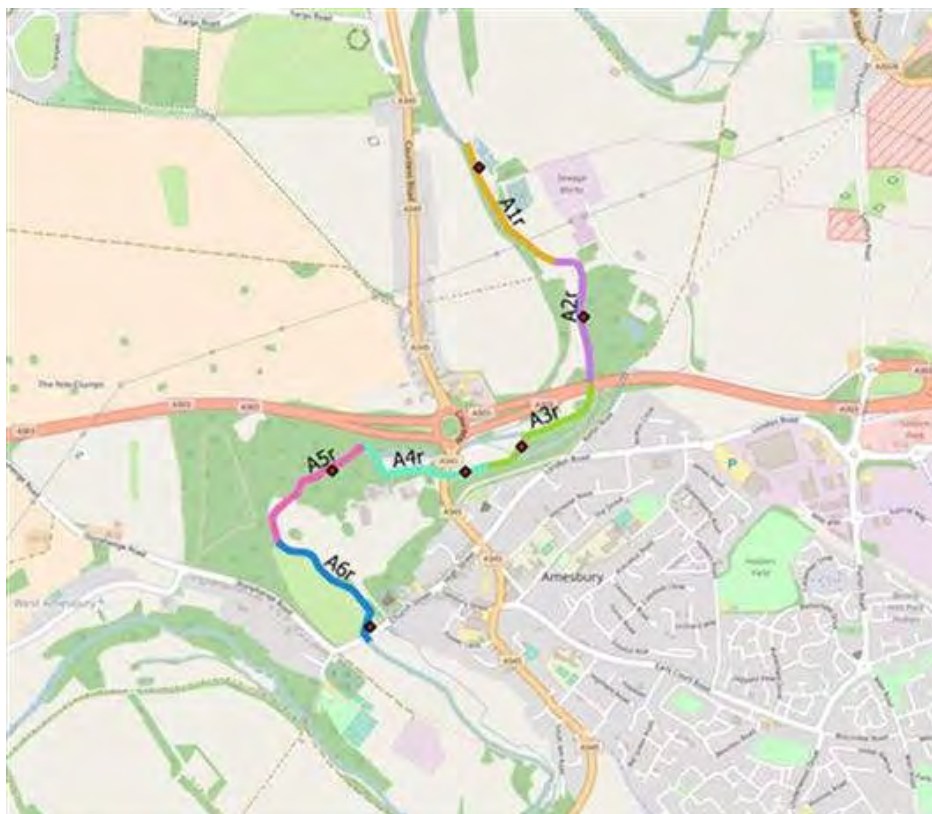


Figure 1: River Avon macroinvertebrate reach and sampling locations (red markers)

Table 1: River reach NGR and macroinvertebrate sampling site location

Survey reach	Upstream NGR	Downstream NGR	Macroinvertebrate sampling point NGR
River Avon A1r	SU 15450 42983	SU 15743 42604	SU 15483 42930
River Avon A2r	SU 15743 42604	SU 15875 42187	SU 15841 42414
River Avon A3r	SU 15875 42187	SU 15529 41900	SU 15630 41965
River Avon A4r	SU 15529 41900	SU 15091 41961	SU 15433 41877
River Avon A5r	SU 15091 41961	SU 14798 41639	SU 14974 41883
River Avon A6r	SU 14798 41639	SU 15101 41316	SU 15106 41343

2 Methods

2.1 Field survey and laboratory identification

2.1.1 Aquatic macroinvertebrate surveys were undertaken by between the 17th and 20th October 2016.

2.1.2 A representative macroinvertebrate sampling site was identified within each of the six survey reaches. At each site a standardised sample was collected in accordance with RIVPACS¹ sampling protocols. This method involved the use of a standard pond net (1mm mesh size) to collect macroinvertebrates by employing kicking and sweeping motions over a three-minute period.

2.1.3 It should be noted that the location of the sample collected from Reach A3r was aligned with the local Riverfly Partnership's² historical sampling location, known as Lord's Walk.

2.1.4 In addition, the full suite of environmental variables required to generate RIVPACS2 community predictions were also recorded for each sampling site. Thus ensuring that, should a full site classification be required in future, the data collected was fit for this purpose.

2.1.5 The samples were preserved in alcohol in the field and returned to the laboratory for species/mixed level identification (RIVPACS IV Taxonomic Level 4³).

2.2 Post survey analysis

2.2.1 A number of biotic indices were calculated from the macroinvertebrate data collected. The aim of calculating these indices is to provide information on the macroinvertebrate communities' sensitivity to organic pollution, changes in river flow, habitat

¹ EU Star UK (2006) RIVPACS Macroinvertebrate Sampling Protocol. Available at: <http://www.eu-star.at/pdf/RivpacsMacroinvertebrateSamplingProtocol.pdf>

² The Riverfly Partnership is network of organisations, representing anglers, conservationists, entomologists, scientists, water course managers and relevant authorities, which act to protect the water quality of rivers; further the understanding of riverfly populations and actively conserve riverfly habitats. The partnership is hosted by Salmon & Trout Conservation UK.

³ Available at: http://eprints.bournemouth.ac.uk/16550/2/SNIFFER_WFD72C_RICT_Final_Report_-_Davy-Bowker,_Clarke_et_al_2008.pdf

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modification and siltation. The following section outlines the methods used to calculate each score and the outputs from each biotic index.

2.3 Biological Monitoring Working Party (BMWP), Average Score per Taxon (ASPT) and Number of Scoring Macroinvertebrate Taxa (NTAXA)

2.3.1 These indices were developed primarily as a means of assessing water quality and do not necessarily correlate intimately with conservation importance. They are underpinned by Pressure Sensitivity (PS) scores, based on tolerance to organic pollutants. These are assigned at a family level ranging from 1 (extremely tolerant) to 10 (extremely sensitive). The scores have been refined since their initial development; however the method of their calculation has not changed.

2.3.2 BMWP is the sum of PS scores for all scoring* macroinvertebrate families recorded in a given sample. Theoretically, a site with good water quality should result in a higher BMWP than a site with poor water quality. Commonly used BMWP interpretation bands are presented in Table 2. NTAXA is simply the number of scoring taxa (families) recorded in the sample. ASPT is the BMWP divided by NTAXA, and is less influenced by seasonal community changes. ASPT is the most appropriate index of the three by which to monitor a site over time.

**Not all macroinvertebrate families have an assigned PS score.*

Table 2: Interpretation of BMWP score

BMWP score	Water quality interpretation
151+	Very High
101-150	High
51-100	Good
17-50	Moderate
0-16	Poor

2.4 Whalley, Hawkes, Paisley and Trigg (WHPT)

2.4.1 The WHPT metric improves on the BMWP method by including a larger data set of reference sites and the addition of an abundance measure to provide a more robust assessment technique. However, the principle of using macroinvertebrate families as biological indicators still remains.

2.4.2 WHPT enables the assessment of macroinvertebrates according to WFD requirements in relation to organic pollution, but also responds to toxic pollution and other degradation sources.

2.4.3 Similar to BMWP, pressure sensitivity (PS) scores are allocated at a family level. However, each PS score also contains an abundance measure (Table 3). This takes into account the density at which a taxon is present in a sample resulting in an increase in metric sensitivity to changes in macroinvertebrate assemblage structure. The sum of the PS scores for all scoring taxa gives the WHPT.

2.4.4 WHPT ASPT is calculated in the same way as for BMWP, by dividing the WHPT score by the number of scoring taxa (WPHT NTAXA).

2.4.5 As with BMWP scoring, a higher WHPT is indicative of higher water quality and lower levels of environmental degradation. As a general rule WHPT scores can be broadly interpreted using Table 2. Although the WHPT values are reported in the results section, the assessment of community response to organic pollution has been described with reference to BMWP scores only.

2.5 Community Conservation Index (CCI)

2.5.1 The CCI accounts for both community richness and the relative rarity of macroinvertebrate species present. It utilises BMWP and the conservation status of individual species. Species are assigned a Conservation Score (CS) in accordance with Table 3 as defined by the Joint Nature Conservation Committee (JNCC) accepted designations.

Table 3: Conservation Scores for freshwater macroinvertebrate species in Great Britain

Conservation Score	Definition
10	RDB1 (Endangered)
9	RDB2 (Vulnerable)
8	RDB3 (Rare)
7	Notable (but not RDB status)
6	Regionally Notable
5	Local
4	Occasional (species not in categories 10–5, which occur in up to 10% of all samples from similar habitats)
3	Frequent (species not in categories 10–5, which occur in >10–25% of all samples from similar habitats)
2	Common (species not in categories 10–5, which occur in >25–50% of all samples from similar habitats)
1	Very Common (species not in categories 10–5, which occur in >50–100% of all samples from similar habitats)

2.5.2 The sum of CSs is calculated and divided by the number of contributing species. This is then multiplied by a Community Score (CoS) determined either by the rarest taxon present or the BMWP (whichever results in the higher CoS) with reference to Table 4. The resulting CCI score can then be interpreted with respect to the Table 5.

Table 4: Community Score (CoS) categories

BMWP	Community Score (CoS)	Highest CS (CSmax)
>301	15	10
251-300	12	9

201-250	10	8
151-200	7	7
101-150	5	5 or 6
51-100	3	3 or 4
1-50	1	1 or 2
0	0	Scoring taxa absent

Table 5: CCI interpretation

CCI	Description	Conservation Value
0.0 to 5.0	Sites supporting only common species and/or a community of low taxon richness.	Low
>5.0 to 10.0	Sites supporting at least one species of restricted distribution and/or a community of moderate taxon richness.	Moderate
>10.0 to 15.0	Sites supporting at least one uncommon species, or several species of restricted distribution and/or a community of high taxon richness.	Fairly High
>15.0 to 20.0	Sites supporting several uncommon species, at least one of which may be nationally rare and/or a community of high taxon richness.	High
>20.0	Sites supporting several rarities, including species of national importance, or at least one extreme rarity (e.g. taxa included in the British RDBs) and/or a community of very high taxon richness.	Very High (potentially of national significance and may merit statutory protection)

2.6 Lotic Invertebrate Flow Evaluation (LIFE)

2.6.1 Lotic Invertebrate Flow Evaluation (LIFE) scores were calculated to give an indication of each macroinvertebrate community's sensitivity to changes in flow.

2.6.2 Species are assigned to a flow group depending on their documented flow preferences (current velocity) ranging from I (Rapid) to VI (Drought Resistant). This has also been undertaken at a family level; however the use of family level data may result in the loss of precision as a number of families contain species with wide-ranging flow requirements. Family level LIFE scores are reported in the result section, but assessment of community response to flow has been described with reference to the species level LIFE score.

2.6.3 Additionally, ubiquitous taxa such as Chironomidae and Oligochaeta are not used in the method as their abundance appears to have no definitive relationship with flow. The calculation of a community LIFE score is underpinned by Flow Scores (fs). These are derived with reference to the abundance/flow group matrix (Table 6), such that both the

abundance and flow preference of recorded taxa is taken into account. Abundance categories are defined by standard EA categories (Table 7).

Table 6: Flow Scores (fs) abundance-flow group matrix

Flow Groups	Abundance categories			
	A	B	C	D/E
I Rapid	9	10	11	12
II Moderate/Fast	8	9	10	11
III Slow/Sluggish	7	7	7	7
IV Flowing/Standing	6	5	4	3
V Standing	5	4	3	2
VI Drought Resistant	4	3	2	1

Table 7: Abundance categories

Category	Estimated abundance
A	1-9
B	10-99
C	100-999
D	1000-9999
E	10 000+

2.6.4 LIFE Scores are calculated by taking the sum of all flow scores and dividing by the number of contributing taxa:

$$\text{LIFE} = \frac{\sum fs}{n}$$

2.6.5 LIFE scores can be broadly interpreted as shown in Table 8.

Table 8: LIFE score interpretation

LIFE score	Interpretation
7.26 and above	High sensitivity to reduced flows
6.51 – 7.25	Moderately sensitive to reduced flows
6.5 and below	Low sensitivity to reduce flows

2.7 Proportion of Sediment-sensitive Invertebrates (PSI)

2.7.1 Proportion of Sediment-sensitive Invertebrates (PSI) was calculated for macroinvertebrate samples collected from each river reach.

2.7.2 PSI is a biotic index designed to describe a macroinvertebrate community's sensitivity to sedimentation. It is based on the known ecological responses of different macroinvertebrate species or family groups to the accumulation of sediment on riverine substrata. The index declines as the pressure of fine sediments cover the river bed.

2.7.3 Those taxa that are known to benefit from, or that are largely unaffected by, sedimentation, are given a high score, known as a 'Sediment Sensitivity Rating (SSR)'. Those taxa that are known to suffer from the accumulation of sediment are given a low SSR. The metric also depends on the relative abundance of different taxa and so is not just dependent on "presence-absence", but also on the numbers of different taxa recorded.

2.7.4 The PSI score describes the percentage of sediment-sensitive taxa present in a sample with high values indicating a greater proportion (percentage) of silt intolerant invertebrate species present within the macroinvertebrate community sampled i.e. the less a site is affected by silt the greater the PSI score. How to interpret the score is shown in Table 9.

Table 9 - Interpretation of PSI scores

PSI score	Riverbed condition
81- 100	Minimally sedimented/unsedimented
61-80	Slightly sedimented
41-60	Moderately sedimented
21-40	Sedimented

2.8 Percentage Ephemeroptera and Trichoptera (%ET)*

2.8.1 %ET is the percentage of macroinvertebrates in the sample (as an abundance of the overall assemblage) that belong to the mayfly and caddisfly orders. These are generally the more pollution sensitive orders of macroinvertebrates and as such, a higher %ET is indicative of higher water quality. It is important to note that in a species rich system, the %ET may low, but water quality may still be high. This is due to the number of other species present reducing the %ET. Additionally, substrate and physical habitat conditions will also impact the species composition within a river and therefore you may find high water quality, but low %ET.

** %ET is usually called %EPT and includes the order Plecoptera (stonefly). However, since no stonefly species were present in the samples, the measure only includes Ephemeroptera and Trichoptera.*

3 Results and site summaries

3.1.1 This section outlines the main results from macroinvertebrate samples on the River Avon. The raw macroinvertebrate survey data (i.e. fully enumerated taxon lists) are not presented, but are available on request. Biotic metrics described in Section 2.2 are provided in Table 10 and Table 11 and are used to describe the macroinvertebrate community characteristics at each site.

3.1.2 The full suite of RIVPACS2 environmental data is not presented although selected habitat variables have been included in the environmental data table (

3.1.3 Table 12).

3.1.4 Macroinvertebrate sampling at the six sites on the River Avon yielded a total of 151 macroinvertebrate taxa. In general the macroinvertebrate communities were characterised by the presence of a species rich assemblage, with a proportionally high representation from macroinvertebrate families sensitive to poor water quality and/or habitat degradation, such as those belonging to the Ephemeroptera and Trichoptera orders.

3.1.5 Water quality and flow metrics indicate that the macroinvertebrate communities present are experiencing limited environmental stress and are representative of very high water quality. They are also likely to be sensitive to change as a result of reduce flow and it is considered that bed sedimentation may be a key factor acting to constrain the assemblages at a survey site and potentially reach scale.

3.1.6 No Red Data Book macroinvertebrate species were recorded during the surveys, although those of a restricted distribution were observed at a number of sites. These comprised the nationally notable riffle beetle species *Riolus subviolaceus* and regionally notable crustacea *Niphargus aquilex*.

Table 10: BMWP, WHPT and LIFE scores for the River Avon macroinvertebrate sampling sites by reach location.

Reach	BMWP score	ASPT	NTaxa	WHPT score	WHPT ASPT	WHPT NTaxa	LIFE score (Species)
A1r	213	5.92	36	226	5.65	40	7.4
A2r	161	5.37	30	178	5.08	35	7.08
A3r	243	5.93	41	257	5.71	45	7.45
A4r	193	5.85	33	200	5.56	36	7.22
A5r	215	5.81	37	240	5.71	42	7.4
A6r	218	6.06	36	231	5.92	39	7.81

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Table 11: CCI, %oligo&chiro, %EPT and PSI scores for the River Avon macroinvertebrate sampling sites by reach location.

Reach	CCI Score	CCI interpretation	% Oligo & Chiro	% EPT	PSI Species Score	Species PSI Interpretation
A1r	17.32	High	61.6	7.4	42.4	Moderately Sedimented
A2r	13.81	Fairly High	49.3	21.3	30.6	Sedimented
A3r	20	High	10.5	25.2	47.7	Moderately Sedimented
A4r	14	Fairly High	27.2	26.4	38.5	Sedimented
A5r	18.5	High	41.8	26.6	44.5	Moderately Sedimented
A6r	22.62	Very High	13.5	23.9	60.4	Slightly sedimented

Table 12: Environmental data recorded at each sampling site within each reach.

Environmental data	A1r	A2r	A3r	A4r	A5r	A6r
pH	7.42	7.91	7.53	7.44	7.11	5.81
O ₂ (mg/l)	11	11.32	12.86	13.27	11.4	9.62
Estimated flow velocity at sample site (cm.s ⁻¹)	10 to 25	10 to 25	10 to 25	<10	10 to 25	25 to 50
Land use - left hand bank	Arable	Grassland and scrub	Mixed woodland	Mixed woodland	Grassland	Housing
Land use – right hand bank	Arable and grassland	Scrub and woodland	Grassland	Grassland	Grassland	Grassland
Flow type	100% glide	20% run; 80% glide	100% glide	100% glide	100% glide	50% run, 50% glide
Dominant substrate	Sand	Sand	Pebbles	Sand	Sand and pebbles	Cobbles
Substrate composition *	Pebbles/ gravel 35%, sand 50%, silt/clay 15%	Pebbles/ gravel 25%, sand 50%, silt/clay 25%	Cobbles 5%, pebbles/ gravel 60%, sand 30%, silt/clay 5%	Cobbles 15%, pebbles/ gravel 30%, sand 40%, silt/clay 15%	Cobbles 1%, pebbles/ gravel 44%, sand 45%, silt/clay 10%	Cobbles (60%, pebbles/ gravel 15%, sand 15%, silt/clay 10%.

*Substrate sizes: Boulders (>256mm), cobbles (64-256mm), pebbles/gravel (2-64mm), sand (0.06-2mm), silt/clay (<0.06mm).

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3.2 Site A1r

3.2.1 At the macroinvertebrate sampling site, water depth was 0.56m and channel width 10m. The flow type was identified as glide and bankside habitats characterised by arable land uses.

3.2.2 The BMWP score of 213, indicates very high water quality at the sampling location. Additionally, the ASPT of 5.92 confirms the site contained a high proportion of pollution sensitive taxa. Therefore, the community at the time of survey was not experiencing significant environmental stress.

3.2.3 The CCI score of 17.32 identifies the site as having high conservation value. Review of the full species assemblage indicates that this classification is a result of the high taxon richness recorded and not due to the presence of uncommon or nationally rare species.

3.2.4 The species LIFE score of 7.4 indicates that the community is highly sensitive to flow reduction. Flow types at the sample site were recorded as 100% glide, with an estimated velocity of 10 to 25 cm.s⁻¹.

3.2.5 The sample returned a PSI species score of 42.36 indicating a moderately sedimented riverbed. This assessment supports field observations of substrate type (15% silt/clay) that indicates a degree of sedimentation at the survey site.

3.3 Site A2r

3.3.1 This reach is located directly upstream of the A303. It is less shaded than site sampled in Reach A1r with the riparian zone characterised by a mixture of scrub, grassland and woodland. At the sample site the river channel was 7m wide and 0.55m deep and characterised by both glide and run flow types. The stream profile and substrate character was comparable to A1r.

3.3.2 The BMWP score of 161 was the lowest across all of the sample sites, although it is still indicative of very high water quality. Similar to upstream, the ASPT score of 5.37, indicates a macroinvertebrate community with a high proportion of pollution sensitive taxa.

3.3.3 The CCI score of 13.81 identifies the community as being of fairly high conservation value. This is a result of the high taxon richness, as well as the presence of a regionally notable shrimp species, *Niphargus aquilex* and a notable (but not Red Data Book) riffle beetle species, *Riolus subviolaceus*. *Riolus subviolaceus* was also recorded in Reach A3r and A6r.

3.3.4 The species LIFE score of 7.08 identifies the macroinvertebrate community as being moderately sensitive to reduced flows and the PSI species score of 30.63, is indicative of a sedimented riverbed. Sedimentation was evident at survey with observations on substrate composition estimated at 25% silt/clay, which was reflected by the notable reduction in sediment sensitive taxa compared to the upstream survey location.

3.4 Site A3r

3.4.1 This site is located directly downstream of the A303. Water depth was shallower than upstream sites, at 0.4m and the width wider, at 14.1m, with glide flow type being

dominant at the sampling site. Riparian habitats were characterised by a mixture of woodland and grassland. The substrate at the sampling location was dominated by pebbles (60%) and sand (30%).

3.4.2 The BMWP score was 243, ASPT 5.93 and NTAXA 41. In line with the upstream reaches, the BMWP score indicates very high water quality at the sample site. This site had the highest BMWP and NTAXA scores of all the sites sampled, potentially indicating an increase in habitat complexity compared to the other sampling locations.

3.4.3 The site was classified as having a high conservation value (CCI = 20). This was driven by the presence of a notable riffle beetle species, *Riolus subviolaceus* combined with the high taxon richness recorded.

3.4.4 The species LIFE score of 7.45 shows the macroinvertebrate community is highly sensitive to reduced flows and the PSI species score of 47.71 indicates a moderately sedimented riverbed which is reflected in the substrate composition; 35% of the substrate was sand, silt and clay, supporting the PSI score.

3.5 Site A4r

3.5.1 At the sample site in Reach A4r the channel was 17.6m wide, notably wider than in the reaches upstream of the A303. The water depth was similar to other reaches, at 0.53m, but velocity was reduced within the glide flow type identified.

3.5.2 The BMWP score of 193 and ASPT of 5.85 again indicate very high water quality at the site.

3.5.3 The CCI of 14 classifies the assemblage as having fairly high conservation value. No notable or rarer were observed at the site, therefore the conservation value was driven by the high taxon richness and some species of minor local importance.

3.5.4 The species LIFE score of 7.22 is indicative of a community moderately sensitive to reduced flows which is supported by the estimates of velocity at survey, which was the lowest of all the sampling sites ($<10\text{cm}\cdot\text{s}^{-1}$).

3.5.5 The PSI species score of 38.53 indicates that the channel bed was sedimented at the sample location, which is supported by the relatively high proportion of silt/clay (15%) observed at survey.

3.6 Site A5r

3.6.1 At the sample site the river was approximately 15m wide and 0.55m deep and characterised by glide flow type. The estimated water velocity was 10 to 25 $\text{cm}\cdot\text{s}^{-1}$, similar to the adjacent upstream sample location in Reach A4r.

3.6.2 The BMWP score of 215 is indicative of very high water quality. The ASPT score of 5.81 indicates that the community contained a high proportion of pollution sensitive taxa within the taxon rich assemblage (NTAXA = 37).

3.6.3 The CCI of 18.5 indicates the site is of high conservation value. This score was driven purely by the high taxon richness observed since no notable macroinvertebrate species were recorded in the sample.

3.6.4 The species LIFE score of 7.4 indicates that the macroinvertebrate community is highly sensitive to reduced flows and the PSI species score of 44.52 indicates the channel bed was moderately sedimented. This complies with the field observations which assessed channel substrate as predominantly a mixture of pebbles, gravel and sand plus a smaller percent cover of silt/clay.

3.7 Site A6r

3.7.1 At the sample location the channel width was approximately 20m and the depth 0.22m. This is markedly wider and shallower than at upstream reaches which is represented by the occurrence of both glide and run flow types. At the sampling location the bankside habitat was characterised by a mixture of housing and grassland.

3.7.2 As with all other sites, the sample had a high BMWP score (218) indicating very high water quality and limited environmental stress. The ASPT of 6.06, was the highest recorded at survey, indicating that this site contained the highest proportion of pollution sensitive taxa within the taxon rich assemblage (NTAXA = 36).

3.7.3 The sample site acquired the highest CCI score of the surveyed reaches, at 22.62. This indicated that the river is of very high conservation value at this location. This score was driven by the presence of notable species and a wide range of taxa in the sample. Specifically, a notable (but not Red Data Book) riffle beetle species, *Riolus subviolaceus* was identified in the sample (note this was also found at sites A2r and A3r).

3.7.4 The species LIFE score of 7.81, was the highest of all the sites sampled. This is indicative of macroinvertebrate communities that is highly sensitive to reduced flows. As such, it shows that the community was not under significant stress from reduced flows at the time of survey. This is supported by the field observation that water velocity was highest in this reach (25-50 cms⁻¹).

3.7.5 The PSI species score of 60.45 is indicative of slightly sedimented channel bed. This was the highest PSI of all the sites and correlates with field observations which recorded A6r as having the highest proportion of the larger sediment sizes (60% cobbles).

Arup Atkins Joint Venture Approvals

Version	Role	Name	Signature	Date
P04	Author	Naomi Lowden		06 January 2017
	Checker	Ellie Derbyshire		13 January 2017
	Checker	Liz Brown		16 August 2017
	Approver	Andy Keen		16 August 2017

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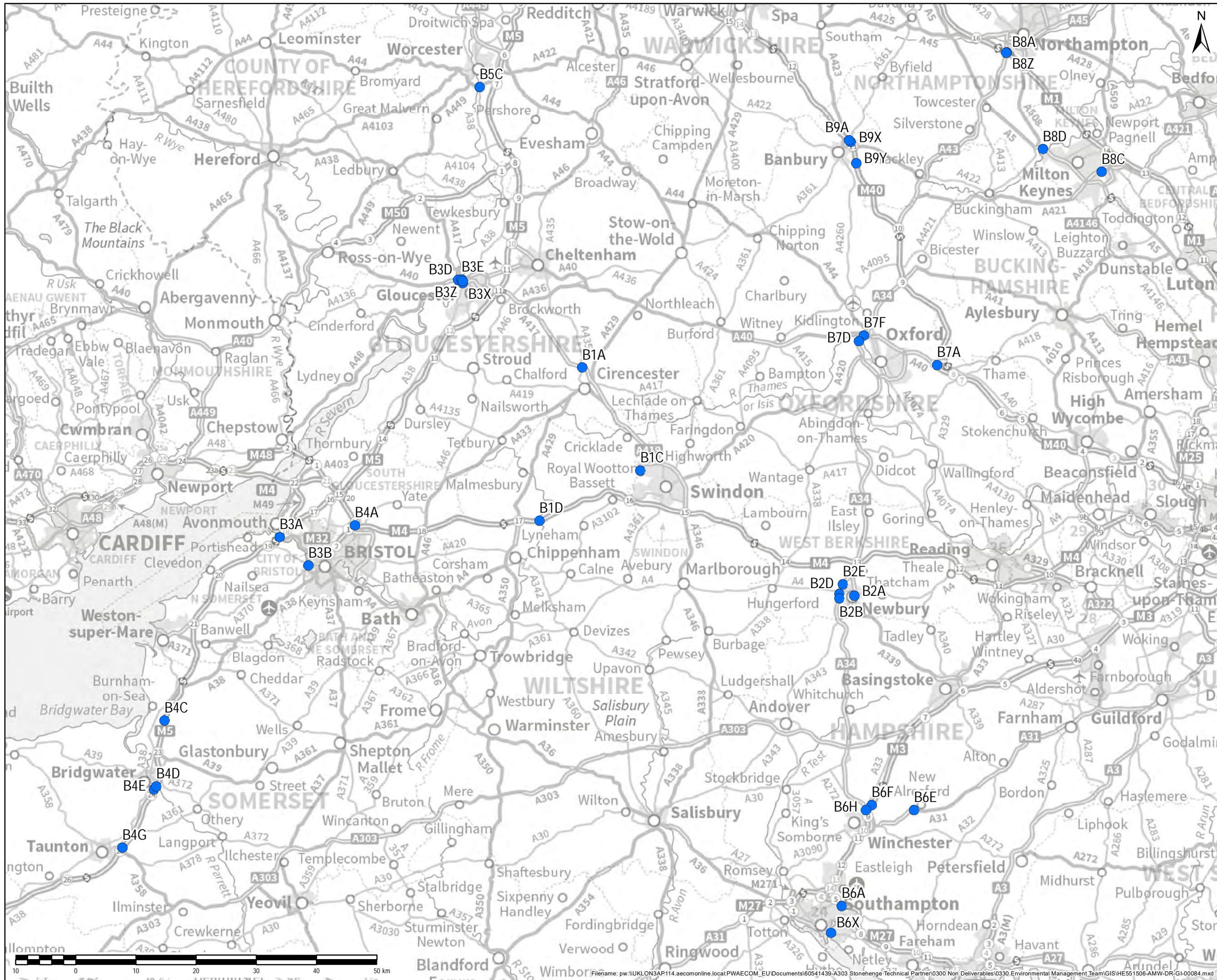
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Appendix C - Figure 1 Appendix D (in Appendix A in Appendix 8.25)



NOTES / LEGEND

- Bridge Sampling Site

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Project Title: A303 STONEHENGE AMESBURY TO BERWICK DOWN

Drawing Title: **FIGURE 1**
MAP OF SOUTHERN ENGLAND SHOWING THE LOCATION OF BRIDGE SAMPLING SITES

Designed	Drawn	Checked	Approved	Date
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