

ENVIRONMENT AGENCY

WRITTEN REPRESENTATIONS

HIGHWAYS ENGLAND RESPONSE

Dear Sir/Madam

Written Representations

Development Consent Order Application M4 - Junctions 3-12 (Smart Motorway)

1. INTRODUCTION

1.1 These Written Representations build on the detail of the Relevant Representations (RR-249) submitted by the Environment Agency in July 2015. They reflect the current position of the Environment Agency (EA) on the application.

1.2 We support the need for the M4 Smart Motorway to alleviate the traffic problems along the existing route and provide an efficient national transport link.

1.3 Although we have no objection to the application in principle we still have some significant outstanding concerns. Our main concerns at this stage relate to flood risk management, navigation and protection of water quality (including compliance with the Water Framework Directive) and biodiversity.

Highways England Comment

1.3.1 Highway England's response to these concerns is set out in detail below.

1.4 We consider it is vital that Highways England and their consultants enter into detailed discussions with us as a matter of urgency to try to resolve these. In some cases our concerns relate to information which has still not been supplied for us to consider despite being requested. In others they relate to identifying and/or agreeing an appropriate legal means of protecting our position.

Highways England Comment

1.4.1 Highways England has engaged with the Environment Agency both pre- and post-application. Highways England and their consultants had discussions with the Environment Agency at a meeting held on 25 September 2015 and

agreed the details required to address the Environment Agency's concerns relating to the requirement for further information and a follow-up meeting with the Environment Agency, which took place on the 28 October 2015. Prior to that meeting, the Environment Agency was issued with the majority of the additional information requested, including an updated Flood Risk Assessment ("FRA") supported by quantitative analysis of floodplain compensation storage requirements; the updated FRA is provided at Appendix A to this Response. It should be noted that this version of the FRA is not final and discussions regarding the FRA are ongoing with the Environment Agency, with the next meeting being scheduled for 6 November 2015. The Examining Authority will be updated on the outcome of these discussions. The FRA is anticipated to be finalised once the ongoing discussion concludes.

1.4.2 Highways England's legal team has also been in contact with the Environment Agency's lawyers to discuss how the mitigation proposals will be secured and the Environment Agency's interests protected. Those discussions are on-going, with the most recent round of responses provided to the Environment Agency on 27 October 2015, prior to the meeting on 28 October 2015. Highways England considers that all information requested by the Environment Agency has now been provided.

1.5 *We will continue to progress matters with the applicant as quickly as possible and keep the Examining Authority (ExA) informed of our progress. We hope to make significant progress before the scheduled issue specific hearings in November.*

1.6 *Our written representations are set out in the following sections:*

- *Introduction and Overview - page 1*
- *Summary of progress on issues - page 3*
- *Flood risk - page 7*
- *Works to culverts - page 16*
- *Water Quality - page 20*
- *Further Information - page 26*

- *Draft DCO, ExA 1st written questions and Land interests - page 27*

1.7 *Where relevant the numbered issues correspond to those raised within our Relevant Representations (RR) (Examination Library reference RR-249).*

2. OVERVIEW

2.1 *As noted within our RR we have previously provided responses to the EIA Scoping Opinion and Section 42 (Planning Act 2008) consultation. On two occasions (5 February 2015 and 18 June 2015) we have also offered to engage with HE through our cost recovery preapplication service. This was declined.*

Highways England Comment

2.1.1 Highways England refutes the statement that they declined to engage. Highways England approached Environment Agency on 22 January 2015 concerning the Statement of Common Ground (“SoCG”) and how this could be progressed. The Environment Agency responded on 5 February 2015 with reference to its cost recovery pre-application service, in respect of which Highways England sought further clarification on 22 April 2015. This followed internal clarification as to Highways England’s approach to the cost recoverable pre-application service. With the Environment Statement nearing completion, together with the difficulty in trying to agree a time when all of the Environment Agency’s specialists could meet, a meeting did not take place until after submission of the Development Consent Order (“DCO”) Application and Environment Agency’s Section 42 (Planning Act 2008) consultation submission. Highways England is committed to continuing engagement with the Environment Agency.

2.2 *We have also been contacted by the applicant to develop a joint Statement of Common Ground (SoCG) and will continue to progress this throughout the application process. On several occasions we sought updates from Highways England (HE) on the creation of the draft SoCG. In July 2015 we were informed that a first draft was still being prepared for our consideration but had been delayed for undisclosed reasons. We initially received a first draft of the SoCG between HE and the Environment Agency on 14 September 2015. We are continuing to work on this document. We have provided a revised draft SoCG to HE for their consideration.*

Highways England Comment

- 2.2.1 Highways England is considering the draft Statement of Common Ground (“SoCG”) provided by the Environment Agency and will prepare a further draft following the meeting on 28 October 2015, at which it is hoped that the issues covered by the SoCG will be progressed. Highways England has updated the Examining Authority on the progress of that SoCG in the Position Paper on SoCGs submitted at Deadline III. A signed version will be provided in advance of the issue specific hearings in November 2015.
- 2.3 *Within our RR submission to the ExA we included an "issues tracker table" which identified the issues, potential impacts on people and the environment and the possible solution or information required that may address our concerns. A copy of the RR and the "issues tracker table" were also provided to HE on 2 July 2015. We advised HE that these documents may help them to establish what information and measures may be required to address our concerns.*
- 2.4 *Currently, there are still a number of important outstanding issues that have been submitted as part of the draft DCO and accompanying information that require further attention or resolution. Due to the programming of the design stages that Highways England follow, a subsequent detailed design phase is scheduled to follow the publication of any DCO. As a result, a number of our representations relate to the need to address concerns through this design phase. However, the basis and evidence for being able to achieve the required mitigation measures within the design stage should be clearly demonstrated through the current application.*

Highways England Comment

- 2.4.1 The evidence demonstrating that the mitigation measures set out in paragraphs 15.4.39 to 15.4.74 of the Environmental Statement (“ES”) (Application Reference Document 6.1), the updated Outline Construction Environmental Management Plan (“CEMP”) (Appendix 4.2A to the ES, Application Reference Document 6.3) and the FRA (Application Reference Document 5.3) can be achieved was provided to the Environment Agency in advance of a meeting between Highways England and the Environment Agency that took place on 28 October 2015. This is explained in greater detail below in response to the concerns identified by the Environment Agency in its written representation.

2.5 *Should the ExA or HE require further clarification on any of the issues noted please feel free to contact me.*

3. SUMMARY OF PROGRESS ON ISSUES

3.1 *Table 1 (below) provides a visual aid as to the issues we have raised both to the applicant during pre-application consultation and also through our Relevant Representations we made to the submission of the Development Consent Order.*

3.2 *For ease of reference we have highlighted each issue in terms of the current position and identified the means through which we consider it could be addressed.*

Key to Table 1.		
<i>Red</i>	<i>Principle issues have not been addressed. Awaiting further information.</i>	
<i>Amber</i>	<i>Principles issues have been discussed but further resolution required.</i>	
<i>Green</i>	<i>Issues resolved.</i>	

3.3 *Our Statement of Common Ground summarises our current position with Highway's England. The following paragraphs provide further detail on our current position and what information may be required to address our concerns. We will, of course, update the ExA as to any outcomes resulting from these discussions.*

Highways England Comment

3.3.1 Highways England's response to the issues raised in Table 1 is provided in a separate column in the table below.

	<i>Issue Ref</i>	<i>Issue</i>	<i>How Addressed</i>	<i>Highways England's Comments</i>
	<i>1.1</i>	<i>The importance of floodplain compensation (FpC) as a precommencement activity needs to be included in the FRA.</i>	<i>Parties agree that FpC is required. Mechanism to secure and implement to be agreed.</i>	Highways England agree that floodplain compensation (“FpC”) is required and confirms that its provision can be achieved by the Scheme, as detailed in Chapter 6 and Annex E of the updated FRA, which is provided at

	<i>Issue Ref</i>	<i>Issue</i>	<i>How Addressed</i>	<i>Highways England's Comments</i>
				Appendix A. Highways England has been in contact with the Environment Agency in relation to this issue and it has been agreed that this will be secured by a requirement in the Draft DCO requiring the provision of a flood compensation strategy. That requirement is included in the Draft DCO submitted at Deadline III.
	1.2	<p><i>Section 4.11 and 5.1.51 of the Flood Risk Assessment (FRA) states that all of the proposed widening is within flood zone 1. This does not appear to be the case as some appears to be within flood zones 2 and 3.</i></p>	<p><i>Awaiting further information/details on FpC from HE.</i></p>	<p>Highways England understands from the detail provided in the Environment Agency's representation below that this concern is addressed towards the Scheme between Junctions 4b and 5.</p> <p>Since the submission of the DCO application, further work has been undertaken to confirm the requirements for compensation storage provision and to verify the feasibility of its provision on a volume for volume, and where possible, level for level basis. A total of 45 sites (both off-line and along the main M4 carriageway between junctions 3 and 12) that are shown on the Environment Agency Flood Map for Planning to be potentially at risk of flooding have been assessed to first, confirm those sites where works will encroach into Flood</p>

	<i>Issue Ref</i>	<i>Issue</i>	<i>How Addressed</i>	<i>Highways England's Comments</i>
				<p>Zone 3 (which represents the maximum extent of the 1 in 100 year plus climate change flood event), and secondly to clarify the provision of sufficient compensation storage at sites confirmed to be in the 1 in 100 year plus climate change floodplain. These sites are detailed in Table 2 of the updated FRA. This table confirms that between Junctions 4b and 5, to which Section 4.11 and 5.1.51 of the submitted FRA (Application Document Reference 5.3) refers, one area of carriageway widening works will result in loss of floodplain storage within Flood Zone 3. For all sites located within Flood Zone 3, FpC assessments have been completed and the results reported in the updated FRA (provided at Appendix A). Mitigation for the flood risk impacts of the Scheme specifically between Junctions 4b and 5 are described in paragraph 5.1.54 of the updated FRA (provided at Appendix A), which demonstrates that a mitigation solution is feasible. That mitigation is secured by way of a new requirement in the draft DCO, which provides for the approval of a</p>

	<i>Issue Ref</i>	<i>Issue</i>	<i>How Addressed</i>	<i>Highways England's Comments</i>
				flood compensation scheme, for the provision of flood compensation, in consultation with the Environment Agency.
	1.3	<p><i>Scheme widening works at junctions 5 to 9 and junctions 12 - 11. We do not know the amount of land raising within the floodplain. Mitigation is proposed but only for surface water run-off. If losses of floodplain storage have not been properly quantified and have not assessed downstream impacts then we cannot be certain that flood risk will not increase as a result of the proposed works.</i></p>	<p><i>Awaiting further information/details on FpC from HE.</i></p>	<p>Since the DCO application submission, the quantitative amount of land raising within the floodplain has been calculated and mitigation for any floodplain storage loss has been assessed at all sites for which Highways England has received Environment Agency data. The results are reported in Chapter 5 and Annex E of the updated FRA at Appendix A. For all sites where FpC is required, information is provided in the updated FRA that demonstrates that a mitigation solution is feasible. However, it should be noted that flood level data for the River Loddon is still awaited from the Environment Agency and is required to fully complete the FpC analysis.</p>

	<i>Issue Ref</i>	<i>Issue</i>	<i>How Addressed</i>	<i>Highways England's Comments</i>
	1.4	<i>The proposed works to Ascot Road and Ascot Road overbridge include a new earthwork embankment within the 1 in 100 with an allowance for climate change flood extent. The FRA does not demonstrate that floodplain compensation can be achieved on a level for level basis.</i>	<i>Awaiting further information/details on FpC from HE.</i>	As stated in response to 1.2 and 1.3, confirmatory FpC assessments have been completed since the DCO application was submitted. The assessment for works at Ascot Road, reported in paragraphs 5.1.20 to 5.1.22 of the updated FRA at Appendix A, has quantified a loss of floodplain storage equal to 90m ³ , compensation for which can be accommodated on a volume for volume basis by removing part of the existing Ascot Road embankment. A level for level compensation solution will be further explored during the detailed design stage and will be provided where it can be achieved within the Order limits and with no worse environmental effects, subject to approval by the Secretary of State and the Environment Agency.
	1.5	<i>The FRA states "Widening of the Thames Bray underbridge would result in a total river bed displacement of 50m². The impact of this displacement is considered to be negligible. We disagree with this conclusion and seek further evidence to reach an agreed</i>	<i>Awaiting further information/details on FpC from HE.</i>	A FpC assessment has been completed at the Thames Bray site and the results (reported in paragraphs 5.1.23 to 5.1.25 of the updated FRA at Appendix A) demonstrate that a floodplain storage loss equal to 113m ³ due to widening of the bridge can be compensated for on a volume for volume basis. With the

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		<i>outcome.</i>		proposed mitigation measures in place, the works at this location are considered to have no impact on flood risk
	1.6	<i>Side road works - Marsh Lane. The FRA does not explain what these works are and what the loss of floodplain storage could be.</i>	<i>Awaiting further information/details on FpC from HE.</i>	The proposed works at Marsh Lane, which comprise demolishing the existing structure and constructing the replacement online structure, do not encroach into Flood Zone 3 (the limits of which have been defined using Environment Agency Product 4 flood level and local topography data). This is demonstrated in Annex E of the updated FRA at Appendix A. FpC is therefore not required at Marsh Lane.
	1.7	<i>Side road works - Monkey Island Lane. The FRA does not demonstrate that compensation can be achieved on a level for level basis.</i>	<i>Awaiting further information/details on FpC from HE.</i>	The updated FRA (paragraphs 5.1.27 and 5.1.28) at Appendix A has quantified that the proposed works at Monkey Island Lane result in a floodplain storage loss of 1125m ³ and that compensation for this loss on a volumetric equivalent and level for level basis can be accommodated by removing part of the existing Monkey Island Lane embankment.

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	1.8	<i>Junctions 7 - 6 Side road - Wood Lane. The FRA does not demonstrate that compensation can be achieved on a level for level basis.</i>	<i>Awaiting further information/details on FpC from HE.</i>	The updated FRA (paragraphs 5.1.37 and 5.1.38) at Appendix A has quantified that the proposed works at Wood Lane result in a floodplain storage loss of 150m ³ and that compensation for this loss on a volumetric equivalent basis can be provided. A level for level compensation solution will be further explored during the detailed design stage of the Scheme and will be provided where it can be achieved within the Order Limits and with no worse environmental affects, subject to approval by the Secretary of State and the Environment Agency.
	1.9	<i>M4 junctions 6 - 5 Side Road - Ridings Court Road. The FRA does not demonstrate compensation can be achieved on a level for level basis.</i>	<i>Awaiting further information/details on FpC from HE.</i>	The updated FRA (paragraphs 5.1.46 and 5.1.47) at Appendix A has quantified that the proposed works at Ridings Court Road result in a floodplain storage loss of 49m ³ and that compensation for this loss on a volumetric equivalent basis can be provided. A level for level compensation solution will be further explored during the detailed design stage of the Scheme and will be provided where it can be achieved within the Order limits and with no worse environmental affects, subject to

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				approval by the Secretary of State and the Environment Agency.
	1.10	<i>M4 junctions 5 - 4b Side road - Old Slade Lane. The FRA states "The works at Old Slade Lane were assessed against EA flood modelling which shows that there are no significant changes between existing and proposed road alignment extent and as such mitigation measures will not be required." The FRA does not quantify "significant". The NPPF and the NPS on National Networks requires there to be no increase in flood risk.</i>	<i>Awaiting further information/details on FpC from HE.</i>	The updated FRA (paragraphs 5.1.57 and 5.1.58) at Appendix A has proven that the proposed works at Old Slane Lane do not encroach into Flood Zone 3 (the limits of which have been defined using Environment Agency Product 4 flood level and local topography data). FpC is therefore not required at Old Slade Lane and there will be no impact on flood risk in this location, as required under the NN NPS because Scheme works will not impede/impact upon the existing storage or movement of floodwaters within the 1 in 100 year plus climate change floodplain.
	2.1	<i>Section 5.1.61 Indicates that work is needed on the Frogs ditch (Main River) proposed between junctions 4 and 3. The Frogs ditch is classified as a main river, Highways England will require a Flood Defence Consent to carry out any works within 8m of the watercourse. The FRA states that the existing ditch can be made hydraulically contiguous with</i>	<i>Confirmation from HE if culverting at this location is still required. If no, issue removed. If yes, require further details on FpC, proposed works, etc...</i>	Highways England notes that the existing M4 is located less than 8m from Frogs Ditch and that Frogs Ditch is not within any fluvial flood plain. Highways England will submit an application for a Flood Defence Consent for the proposed works. Highways England is currently investigating what engineering options are possible for Frogs Ditch but can confirm that no

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		<i>upstream and downstream ditches by installing pipe culverts where required.</i>		culverting or diversion of the ditch will be required, as detailed in paragraph 5.1.63 of the updated FRA at Appendix A.
	2.2	<i>Chalvey culvert - We do not know the extent of the works on the culvert so do not know whether there could be any potential impacts and whether any mitigation would be required to ensure that there was no increase in flood risk.</i>	<i>General issues discussed - require further clarification on compensation/mitigation measures and how these will be secured.</i>	Highways England informed the Environment Agency at their meeting on 25 September 2015 that only the length of the existing Chalvey Culvert will be extended, with no change proposed to its width or height. As detailed in paragraph 5.1.39 of the updated FRA at Appendix A, downstream flood risk will not therefore increase as the same volume of water will pass through the culvert opening at the same rate as in the existing situation. Potential for increased flood risk upstream of the culvert due to water being contained within the lengthened culvert for a longer period and floodwater consequently "backing-up" and increasing flood water levels upstream will be mitigated by provision of a floodplain compensation scheme, which is secured by the addition of a new requirement at Schedule 2 to the draft DCO. As a result, there will be no increase in flood risk resulting from the

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				culvert extension works.
	2.3	<i>The Ashley Arch on Datchet Common Brook is proposed to be extended. We do not know the extent of the works on the culvert so do not know whether there could be any potential impacts and whether work would be required to mitigate for an increase in flood risk.</i>	<i>General issues discussed - require further clarification on compensation/mitigation measures and how these will be secured.</i>	Highways England informed the Environment Agency at their meeting on 25 September 2015 that only the length of the existing Ashley's Arch Culvert will be extended, with no change proposed to its width or height. As detailed in paragraph 5.1.48 of the updated FRA at Appendix A, downstream flood risk will not therefore increase as the same volume of water will pass through the culvert opening at the same rate as in the existing situation. Potential for increased flood risk upstream of the culvert due to water being contained within the lengthened culvert for a longer period and floodwater consequently "backing-up" and increasing flood water levels upstream will be mitigated by provision of a floodplain compensation scheme, which is secured by the addition of a new requirement at Schedule 2 to the draft DCO. As a result there will be no increase in flood risk resulting from the culvert extension works.
	3.1	<i>Out of a number of</i>	<i>Some information has</i>	Stage 3 of the Water

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		<p><i>WFD water bodies identified as potentially being impacted, only three were scoped into this assessment and will be taken forward to Stage 4. The reasons for scoping out most of the WFD water bodies needs to be included.</i></p>	<p><i>been provided however, further clarification is required from HE. Awaiting response.</i></p>	<p>Framework Directive (“WFD”) Compliance Assessment identified those water bodies, previously identified in Stage 2, which have the potential to be affected by the Scheme (paragraph 6.1.1) (Document Application Reference 7.6). Anticipated works within and/or directly adjacent to WFD water bodies, as shown in Table 6.1 of the WFD Compliance Assessment, affect the River Thames, Chalvey Ditch and Datchet Common Brook.</p> <p>The reason, therefore, for taking forward these three water bodies to Stage 4, as outlined in paragraph 6.1.3 of the WFD Compliance Assessment, is that construction works associated with the Scheme are anticipated to have a potential impact on the WFD objectives of these three water bodies. The remaining water bodies identified along the Scheme in Table 5.1 of the WFD Compliance Assessment were scoped out and not taken forward to Stage 4, because no works within or directly adjacent to them are proposed so there is no potential for these water bodies to be directly impacted or for achievement of the</p>

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				WFD objectives to be compromised by the Scheme.
	3.2	<i>Table 5.1 of the WFD Compliance Assessment shows the WFD 2009 legal baseline data as "Current" ecological status. The WFD Compliance Assessment should account both for the legal baseline and for the current status.</i>	<i>A comparative assessment has been provided based on the 2009 and 2014 data. Overall conclusions may not yet be agreed but this issue has been addressed.</i>	Highways England is pleased to note that the Environment Agency confirms that this issue has been addressed.
	3.3	<i>The WFD Compliance Assessment does not include an assessment as to whether the proposed works will inhibit the implementation of measures being undertaken/recommended by the EA to address ecological failures.</i>	<i>Principles discussed but further details about measures required. Securing/implementation mechanism also to be agreed.</i>	Highways England will continue to engage in discussions with the Environment Agency to establish the details of their schemes and to seek to prevent any potential ecological failures as a result of the combined schemes.
	3.4	<i>There are two WFD Chalvey Ditch water bodies. GB106039023470 is the one scoped in for further assessment but it is GB106039023550 that actually flows under the M4.</i>	<i>Clarification sought. Awaiting response</i>	Highways England confirms that GB106039023470 is the water body scoped in for further assessment rather than GB106039023550 that actually flows under the M4. A comparison of the two water bodies has been made, with details provided in Appendix B to this response Given this comparison, it is concluded that the difference between the WFD attributes of the two water bodies is minor and that the conclusions of the assessment with regard to Chalvey Ditch

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				<p>remain applicable. Accordingly, there was no need to carry out further assessment in relation to GB106039023550.</p>
	3.5	<p><i>We do not agree that the effects on habitats and plants is neutral, given that there will be loss of river habitats (channel bed, margins and banks) as a result of bridge widening and culvert lengthening.</i></p>	<p><i>Further information required</i></p>	<p>Small areas of watercourse habitats will be lost due to works at the Chalvey Culvert; Ashley's Arch Culvert and Thames Bray Bridge. The impact of the loss of in-channel habitats has been assessed using the matrix in Table 9.4.2 in Appendix 9.4 of the ES (Application Document Reference 6.3). The impact of the works is considered to be 'neutral' (defined as: 'No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error'; DMRB Volume 11, Section 2, Part 5 (HA 205/08)). This conclusion is largely based on the small area of channel affected.</p> <p>Please see paragraphs 23.1 to 23.3.9 of this document, below for further comment.</p>

	<i>Issue Ref</i>	<i>Issue</i>	<i>How Addressed</i>	<i>Highways England's Comments</i>
	3.6	<i>Confirmation is required as to whether there will be any permanent loss of water vole habitat</i>	<i>Awaiting confirmation</i>	<p>The Scheme will not affect water voles in their current distribution (the baseline). This is because no works to occupied water vole habitats (or within 5m of watercourses occupied by water voles) are proposed (as stated in paragraph 9.4.81 of the ES (Application Document Reference 6.1)). Therefore, neither a licence under the Wildlife and Countryside Act 1981 (as amended) nor any targeted mitigation will be required.</p> <p>Please see paragraphs 25.1 to 25.4.4 of this document, below for further comment.</p>
	3.8	<i>Section 9.4.113. We welcome the proposed use of otter fencing but think that it should not just be restricted to areas where evidence of otters has been recorded. It should be extended to include all areas where otters could potentially cross</i>	<i>Principles of the issue have been discussed with HE. Securing mechanism yet to be agreed.</i>	<p>As noted in paragraph 9.4.113 of the ES (Application Document Reference 6.1), otter fencing will be focused around bridges over watercourses where evidence of otters has been recorded. However, it is not Highways England's intention to restrict otter fencing only to these locations. Indeed, Highways England has assumed that any other watercourses which pass beneath or adjacent to the Scheme may be used by otters from time to time (paragraph 9.4.111 of the ES (Application Document</p>

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				<p>Reference 6.1)). As such, otter fencing is proposed at other watercourse crossings, for example at chainage 16000, east of junction 4. The otter fencing proposed is to be secured pursuant to a scheme to be approved in consultation with the Environment Agency, as provided for in a new requirement at Schedule 2 of the DCO, which is included in the revised DCO submitted at Deadline III.</p> <p>A requirement addressing otter fencing is included in the draft DCO submitted at Deadline III.</p> <p>Opportunities to increase provision of otter fencing – for example associated with the provision of otter ledges within culverts (see below) – will be considered at detailed design, and approved via the scheme secured in the requirement referred to above.</p> <p>Please see paragraphs 25.4.1 to 25.4.4 of this document, below for further comment.</p>
	3.9	<i>Table 9.5: Ecology and nature conservation impact summary. The permanent loss of river habitats through the enlarging of bridges and culverts has not</i>	<i>Further information and discussion required</i>	All habitats and plants, including river habitats, have been addressed in Table 9.5, as explained further below at paragraphs 23.1 - 23.3.9. Highways

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		<i>been addressed in this table. Environment Agency consent will be required for these works and according to our culvert policy, where we do allow culverting, we require adequate mitigation.</i>		<p>England notes that Environment Agency consent will be required for works involving the enlarging of bridges and culverts which result in the permanent loss of river habitats and that mitigation will be required where culverting does take place. These consents are recognised as being required in the report 'Details of other consents and licences' (Application Document Reference 5.5) that was submitted with the DCO Application and set outs the additional consents that may be required.</p> <p>Please see paragraphs 23.1 to 23.3.9 of this document, below.</p>
	3.10	<i>Dewatering of excavations has the potential to damage the receiving watercourses.</i>	<i>This will be dealt with at Detailed design stage. Securing mechanism yet to be agreed.</i>	<p>The requirement for dewatering of excavations as part of the Scheme is expected to be limited. Other than the overbridges that are to be reconstructed offline, it is anticipated that the majority of structural foundations will be piled and will therefore not require dewatering of excavations. At some of the new overbridges where spread foundations are anticipated, and where dewatering proves unavoidable, then suitable pollution prevention controls</p>

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				such as settlement ponds, sediment traps and visual checks/monitoring will be put in place, as detailed in paragraphs 14.2.3 and 14.6.3 of the Outline CEMP (Appendix 4.2A of the ES) (Application Document Reference 6.3). All necessary consent applications linked to the discharge of waters from excavations will be made at the appropriate juncture.

4. 1.0 - FLOOD RISK OVERVIEW

4.1 1.0.1 - *The Environment Agency has made formal comments regarding flood risk in response to all formal consultations. After reviewing the Environmental Statement and accompanying FRA we continue to have a number of issues.*

4.2 1.0.2 - *As noted within our Relevant Representations (RR) the submitted information within the flood risk assessment (FRA) is inadequate. It does not fully assess the impacts of the scheme with regards to flood risk. Specifically, the applicant has not satisfactorily assessed the impacts of the proposed works in relation to upstream and downstream flood risk. Furthermore, they have not properly quantified the loss of floodplain storage and the associated compensation that may be required as a mitigation measure.*

Highways England Comment

4.2.1 Since submission of the FRA as part of the DCO Application (Application Document Reference 5.3), Highways England has completed an assessment of flood risk (including upstream and downstream flood risk) and any resulting floodplain compensation (“FpC”) required for all sites confirmed as encroaching into Flood Zone 3 for which Environment Agency data has been received (please note that Highways England are still awaiting Product 4

flood level data for the River Loddon). Volumetric losses of floodplain storage have been quantified and analysis has been completed to prove the viability of providing compensation storage on a volume for volume, and at some sites level for level basis. The results of the analysis are included in Annex E of the updated FRA, which is provided at Appendix A. The updated FRA is therefore sufficient and the impacts of the Scheme with regard to flood risk have been fully quantified, and suitable mitigation identified.

- 4.3 *1.0.3 - The applicant is proposing works within the floodplain without demonstrating that "level for level" compensation is achievable. Therefore the applicant has failed to demonstrate that there would not be an increase in flood risk elsewhere as a result of the proposed works as required by paragraph 5.99 of the NPS for National Networks (NPSNN).*

Highways England Comment

- 4.3.1 Since the DCO Application submission, Highways England has completed FpC assessments, using available Environment Agency data. At those sites where the largest losses of floodplain storage have been calculated (references R6, R18/19, R32 and Monkey Island Lane – located in the updated FRA at Appendix A), level for level FpC is achievable to ensure that the Scheme will have no impact on upstream or downstream fluvial flood risk. At the remainder of the sites, the assessments completed to date demonstrate that volume for volume FpC is achievable. Highways England has demonstrated that at the sites most impacted by the Scheme in terms of floodplain storage losses mitigation can be facilitated on a level for level basis (where to mirror the existing situation for a particular flood, at each flood level (assessed at 0.2 metre vertical intervals) the excavated and filled volumes are equal) and at all other sites on a volume for volume basis (where the same volume of flood storage is created that is lost but not necessarily at the same elevation/level). At sites where floodplain storage losses are small (typically less than 150m³), provision of a volume for volume compensation scheme is considered appropriate and accordingly, Highways England considers that it has demonstrated that there would not be an increase in flood risk as a result of the proposed works as required by paragraph 5.99 of the National Policy Statement for National Networks (“NN NPS”). Highways England will continue to further develop these floodplain compensation solutions during the detailed design stage of the Scheme, with compensation

being provided on a level for level basis where it can be achieved within the Order limits and with no worse environmental affects, subject to approval by the Secretary of State and the Environment Agency.

4.4 1.0.4 - *Flood storage compensation is required to mitigate for loss of storage for all flood events up to and including the 1% annual exceedance probability (AEP) (1 in 100 year) with an allowance for climate change flood event.*

4.5 1.0.5 - *The FRA explains that compensation will be provided for and assessed at the detailed design stage. The applicant has suggested that there is the required compensatory storage volume for the proposed earth embankment works but have only supplied volumes. We do not know whether this will be on a level for level basis or volumetric compensation. It could even be provided on a mixture of the two but this is not confirmed. If volumetric compensation is the only option for providing mitigation there could be an increase in flood risk in the higher order events.*

Highways England Comment

4.5.1 Since the submission of the FRA as part of the DCO Application (Application Document Reference 5.3), FpC assessments have been undertaken by Highways England for works located within the 1% annual exceedance probability (“AEP”) (1 in 100yr) plus climate change floodplain. The results of these assessments are described in paragraph 4.3.1 above, which confirms that a mixture of level for level and volumetric compensation will be provided.

4.6 1.0.6 - *The earth embankment work totals 6300m². It appears that HE are also proposing some small sections of land raising for the Emergency Refuge Areas (ERAs) which is 400m² per Junction. Without further details about these from the outset, it is unclear if the applicant will be able to satisfactorily provide the required floodplain compensation or how they propose to implement/secure them.*

Highways England Comment

4.6.1 Across the Scheme, Highways England has identified 45 sites where proposed works may be located within the fluvial floodplain (Flood Zones 2 and 3). At each of these sites, Environment Agency flood water level data and topography information has been used to confirm those sites that do

encroach into Flood Zone 3. For sites located within Flood Zone 3, FpC assessments have been completed and the results reported in Chapter 6 and Annex E of the updated FRA, which is provided at Appendix A. For all sites where FpC is required, information is provided in the updated FRA that demonstrates that a mitigation solution is feasible. The FpC will be secured by a requirement in the DCO, which is included in Schedule 2 of the version of the draft DCO submitted at Deadline III.

4.7 *1.0.7 - Paragraph 5.96 of the NPS states that If the Environment Agency has concerns about the proposal on flood risk grounds, "the applicant is encouraged to discuss these concerns with the Environment Agency and look to agree ways in which the proposal might be amended, or additional information provided, which would satisfy the Environment Agency's concerns".*

4.8 *1.0.8 - In summary we require:*

- *A revised FRA and associated drawings, which include all the evidence requested within the issues detailed below. This will allow us to fully assess the flood risk issues relating to the scheme. These issues mainly relate to floodplain concerns and flood compensation areas;*

Highways England Comment

4.8.1 Interim results of the FpC assessments were provided to the Environment Agency in a technical note issued on 30 September 2015 and subsequently assessment works have continued and an update to the FRA has been prepared. An interim update to the FRA was issued to the Environment Agency prior to the meeting between the parties on 28 October 2015. The updated FRA (provided at Appendix A) will be finalised on receipt of all outstanding Environment Agency flood data as data for the River Loddon is still awaited from the Environment Agency.

- *Written confirmation that HE will not be seeking to disapply our flood defence consenting regime as set out under the Water Resources Act 1991 and land drainage byelaws. If HE seek to disapply this consenting regime additional protective provisions within the DCO will be sought as it is important for us to retain our ability to approve any works affecting main rivers in order to ensure that there will be no*

increase in flood risk elsewhere and no adverse impact on the status of the relevant Water Framework Directive (WFD) waterbodies.

Highways England Comment

4.8.2 Highways England acknowledge the flood defence consenting regime of the Environment Agency, as set out under the Water Resources Act 1991 and land drainage byelaws, and confirms that there have been discussions between Highways England and the Environment Agency on this point. At present, Highways England is not seeking to dis-apply this regime, and confirms that all required consent applications will be lodged at the appropriate juncture. However, should Highways England seek to disapply the flood defence consenting regime, they will consult with the Environment Agency to reach agreement regarding the inclusion of additional protective provisions within the DCO.

4.9 *1.0.9 - So long as the additional information required evidences that sufficient floodplain compensation areas are available and indicates what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Specific issues are looked at in more detail below.

Highways England Comment

4.9.1 Highways England welcomes the Environment Agency's confirmation that the Environment Agency anticipates being able to agree a mechanism to secure the required flood water storage during the course of the Examination. As stated above, further assessment results are documented in the updated FRA (provided at Appendix A) and associated drawings which were provided to, and discussed at a meeting with, the Environment Agency on 28 October 2015, which provide sufficient evidence that floodplain compensation can be provided on a mixed level for level and volumetric basis within the Scheme. The FpC detailed in the updated FRA is secured by a new requirement in the DCO, as explained above.

5. 1.1 - RR ISSUE 1.1 - FLOODPLAIN COMPENSATION (FpC) COMMENCEMENT PRIOR TO RELEVANT ROAD CONSTRUCTION.

5.1 1.1.1 - Our RR state:

"The flood risk assessment (FRA) needs to explain why it is so important that the FpC areas are constructed prior to the commencement of the construction of the relevant road sections, to prevent an overall loss of floodplain.

During construction if there is loss of floodplain and the FpC has not been contoured and there was a flood event, this could result in floodwater moving elsewhere and increase the risk of flooding to others. It could also hamper the works as flood water will try to take its natural route and move into these areas which may be under construction.

Construction activity will result in the compaction of soils which will increase the velocity of surface water run-off. Compensation areas are therefore required to prevent this run-off causing deterioration to water quality in receiving watercourses.

EA proposed solution: We seek that an agreement is set out within the FRA that ensures the phasing of each relevant section of road will trigger the flood compensation to be constructed prior to its commencement. This principle would feed into the phasing plan for the scheme. This should be required to be conducted as part of the detailed design phase."

5.2 1.1.2 - The submitted FRA (APP-077) states that FpC will be required.

5.3 1.1.3 - We still require more detailed information on this topic to ensure satisfactory compensation can be provided and that flood risk will not be increased. This is explained further within other issues and paragraphs of our written representations.

Highways England Comment

- 5.3.1 Highways England has provided evidence to the Environment Agency that floodplain compensation can be provided on a mixed level for level and volumetric basis within the Scheme via an update to the FRA (provided at Appendix A). The FpC assessments completed to date demonstrate that satisfactory compensation can be provided and that flood risk will not be increased. The new requirement in the DCO provides, via the approval of a Flood Compensation Strategy,, that works in the floodplain will not be carried out until the requisite flood compensation has been provided.

- 5.4 *1.1.4 - The submitted FRA, outline CEMP and draft DCO do not appear to include any agreement mechanism to ensure that the required FpC for each phase of the scheme will be implemented and completed prior to other construction work commencing. Section 14.7 of the outline CEMP does refer to flood risk. However, there is no mention of the need to provide flood storage compensation and how this will be incorporated within the phasing of works programme.*

Highways England Comment

- 5.4.1 Highways England has been in discussions with the Environment Agency regarding the appropriate mechanism for securing the mitigation required. As noted above, a requirement has been included in the revised Draft DCO submitted at Deadline III that secures the provision of the FpC, via the approval of a Flood Compensation Strategy, within the timescales required by the Environment Agency.

- 5.5 *1.1.5 - As stated in our RR's without the completion of appropriate FpC prior to the commencement of the remaining works it is likely that the proposed development would result in increasing flood risk onsite or elsewhere. Additionally, construction works alone without the appropriate compensation may increase flood risk through the impendence of flood water flows. We view any increase in flood risk or impendence of flood water flows to be detrimental to people and the environment. Our position is supported by paragraphs 5.99 and 5.109 of the NPS NN. If flood risk is not appropriately addressed it may lead to an increase in the frequency of flooding in areas already susceptible to flooding or place areas that were located within flood zone 1 (low probability of flooding from rivers) at risk of flooding. Flooding can result in negative economic and social impacts including travel disruption and in more significant events pose a risk to people's lives.*

Highways England Comment

- 5.5.1 Highways England considers that the additional information provided in the updated FRA (Appendix A) will provide the Environment Agency with the required comfort that the fluvial flood risk mitigation strategy proposed, providing FpC committed to in the ES, is practically feasible to ensure that flood risk is not increased and that the Scheme is not detrimental to people and the environment as a result of flood risk.

- 5.6 1.1.6 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

- 5.6.1 Additional information was provided to the Environment Agency in the form of a technical note issued on 30 September 2015 and a further update was provided to the Environment Agency on 28 October 2015 in the form of an updated FRA. The updated FRA, which is provided at Appendix A, confirms that sufficient floodplain compensation areas are available and details what form of compensation will be provided. Compensation is to be provided on a mixed level for level and volumetric basis. As noted above, a requirement has been included in the Draft DCO submitted at Deadline III to ensure the implementation of required flood water storage within the timescales required by the Environment Agency.

6. 1.2 - RR ISSUE 1.2 - THE FLOOD RISK ASSESSMENT (FRA) STATES THAT ALL OF THE PROPOSED WIDENING IS WITHIN FLOOD ZONE 1.

6.1 1.2.1 - *Our RR state:*

"Section 4.11 and 5.1.51 of the Flood Risk Assessment (FRA) states that all of the proposed widening is within flood zone 1. This does not appear to be the case as some appears to be within flood zones 2 and 3.

The FRA has not adequately assessed the impact of the proposed works on flood risk between junctions 4b and 5. If development is proposed within flood zone 3 then this has the potential to increase flood risk downstream if any works are not appropriately mitigated for.

EA proposed solution: More detailed information/plans are required to demonstrate whether the proposed works are within the floodplain or not. If works are within the floodplain then they will need to be compensated for on a level for level basis. Information on floodplain

compensation needs to be provided as part of the FRA which supports the Development Consent Order application."

- 6.2 *1.2.2 - As noted in paragraphs 1.1.2 to 1.1.6 of this statement development within flood zones 2 and 3 without the appropriate FpC measures can result in increasing flood risk both on site and elsewhere.*
- 6.3 *1.2.3 - Paragraphs 5.92 to 5.93 of the NPSNN states that applications for projects in flood zones 2 and 3 should be accompanied by a FRA. "This should identify and assess the risks of all forms of flooding to and from the project and demonstrate how these flood risk will be managed, taking climate change into account". Furthermore, NPSNN paragraph 5.99 states that "when determining an application the Secretary of State should be satisfied that flood risk will not be increased elsewhere and only consider development appropriate in areas at risk of flooding where it can be demonstrated that: development is appropriately flood resilient and resistant...and that any residual risk can be safely managed."*

Highways England Comment

- 6.3.1 Since the submission of the DCO Application, further work has been undertaken to confirm the requirements for compensation storage provision and to verify the feasibility of its provision on a volume for volume, and where possible, level for level basis. A total of 45 sites (both off-line and along the main M4 carriageway) that are shown on the Environment Agency Flood Map for Planning to be potentially at risk of flooding have been assessed to firstly confirm those sites where works will encroach into Flood Zone 3 and secondly to clarify the provision of sufficient compensation storage at sites confirmed to be in the floodplain. These sites are detailed in Table 2 of the updated FRA (provided at Appendix A). This table confirms that between Junctions 4b and 5, one area of carriageway widening works will result in loss of floodplain storage within Flood Zone 3. For all sites located within Flood Zone 3, FpC assessments have been completed and the results reported in the updated FRA (provided at Appendix A). Mitigation for the flood risk impacts of the Scheme specifically between Junctions 4b and 5 are described in paragraph 5.1.54 of the updated FRA, which demonstrates that a mitigation solution is feasible.
- 6.3.2 Flood compensation will be provided in accordance with a flood compensation scheme, to be approved by the Secretary of State in

consultation with the Environment Agency. The provision of the flood compensation scheme is secured by a requirement in Schedule 2 of the DCO. In line with the Environment Agency's requirements, the flood compensation scheme will include details of the phasing of flood compensation in accordance with the phasing of construction of the Scheme as set out in flood compensation scheme. The requirement in the DCO also provides that construction of any scheduled work within any part of the 1 in 100 floodplain shall not be commenced until the approved flood compensation scheme for that phase has been completed.

6.3.3 Highways England considers that the additional information produced is sufficient to satisfy the Environment Agency's concerns and demonstrates that flood risk will not be increased and that the Scheme is appropriately flood resilient and resistant in compliance with the requirements of the NN NPS.

6.4 *1.2.4 - HE requested detailed flood modelling for various sections along the route from our Customers and Engagement team in August 2015. This information was collated as soon as possible and was issued to HE on the 10, 11 and 29 of September 2015. From liaising with HE we understand that this data will now be used to calculate and provide information on the areas where the proposed works will be located within flood zones 2 and 3. Additionally it will be used to help calculate what FpC is required. At a meeting between HE and the EA on 25 September 2015 it was agreed that some of this information would be provided to us for review by 30 September 2015 with the rest to follow as soon as possible. We are still awaiting this information. Upon receipt of it we will review the details to confirm if they address our concerns.*

Highways England Comment

6.4.1 Highways England can confirm that it has received the majority of this information from the Environment Agency, which has been used to develop the updated FRA (provided at Appendix A), which shows those areas of the Scheme which will involve works within Flood Zones 2 and 3, and to calculate what FpC is required for works in Flood Zone 3. That information was provided to the Environment Agency in advance of a meeting between the parties on 28 October 2015. However, Highways England still awaits

flood level data for the River Loddon from the Environment Agency, which is required to fully complete the FpC analysis.

7. 1.3 - RR ISSUE 1.3 – SCHEME WIDENING WORKS AT JUNCTIONS 5 TO 9 AND JUNCTIONS 12 TO 11

7.1 1.3.1 - Our RR state:

"The FRA states the scheme widening works do not change the route or levels of the existing carriageway but the exceptions to this are the Emergency Refuge Areas (ERAs). The FRA states the additional impermeable areas are approximately 400m² per ERA. The submitted FRA states that "The extent of widening works is not significant compared to the existing motorway. The impact on flood extent flood levels and fluvial flood risk elsewhere is not anticipated to be significant." However, this is not quantified. We do not know the amount of land raising within the floodplain. Mitigation is proposed but only for surface water run-off. If losses of floodplain storage have not been properly quantified and have not assessed downstream impacts then we cannot be certain that flood risk will not increase as a result of the proposed works. The increase in built footprint may reduce flood storage and impact on flood conveyance thereby increasing the risk to others."

EA proposed solution: Where these areas are within the floodplain and land raising is occurring the flood risk assessment should quantify the amount of floodplain storage lost to the development and provide compensation to mitigate on a level for level basis. The compensation areas should be provided in a hydrologically and hydraulically linked area to ensure that there is no increase in flood risk upstream or downstream."

7.2 1.3.2 - It was agreed at our meeting on the 25 September 2015 that further FpC information and assessments would need to be provided as part of the application. The new information will seek to determine whether there is an increase in flood risk and if so, what location and type of compensation will be provided. We understand that this work is ongoing. We look forward to reviewing the forthcoming information. However, at the time of writing we have not yet received any additional information and therefore our position must remain as stated above.

7.3 1.3.3 - At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to

agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.

Highways England Comment

7.3.1 The amount of land raising within the 1 in 100 year plus climate change floodplain has been quantified and is reported in the updated FRA, provided at Appendix A. Sites within the Scheme where works in the floodplain are required are illustrated in a series of drawings provided as Annex G to the updated FRA and volumes of floodplain storage loss at specific work sites are reported in Chapter 5 of the updated FRA and at Annex E. Chapter 6 of the updated FRA describes the floodplain compensation assessment that has been completed, presenting information on level for level and volume for volume compensation schemes at each affected works site. A mechanism to secure the floodplain compensation is documented in Section 6.4 of the updated FRA, and is explained above at paragraph 6.3.2.

7.3.2 Highways England therefore considers that the sufficient information has now been provided to the Environment Agency to demonstrate that the Scheme will have no detrimental impact on existing fluvial flood risk.

8. 1.4 - RR ISSUE 1.4 - JUNCTIONS 8/9 SIDE ROAD WORKS - ASCOT ROAD

8.1 1.4.1 - Our RR state:

"The proposed works to Ascot Road and Ascot Road overbridge include a new earthwork embankment within the 1 in 100 with an allowance for climate change flood extent. This has been estimated to be approximately 1400m² of works to the new embankment within the floodplain. This is proposed to be mitigated for by removal of part of the existing Ascot Road embankment. The indicative flood storage area available by removal of the existing embankment is 3800m².

The FRA does not demonstrate that floodplain compensation can be achieved on a level for level basis. The FRA states "the precise arrangement of any required floodplain compensation will be confirmed following further assessment during the detailed design phase.

If not appropriately compensated for the increase in built footprint may reduce flood storage and potentially also impact on flood conveyance thereby increasing the risk to others. If losses of floodplain storage have not been properly quantified then we cannot be certain that flood risk will not increase as a result of the proposed works.

EA proposed solution: Where land raising is proposed within the floodplain then the flood risk assessment should quantify the amount of floodplain storage lost to the development and provide compensation to mitigate for this on a level for level basis. The compensation areas should be provided in hydrologically and hydraulically linked areas to ensure that there is no increase in flood risk upstream or downstream."

- 8.2 1.4.2 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

- 8.2.1 Confirmatory FpC assessments have been completed since the DCO Application was submitted and additional information was provided to the Environment Agency on 30 September and 26 October 2015.
- 8.2.2 The assessment for works at Ascot Road, reported in paragraphs 5.1.20 to 5.1.22 of the updated FRA (provided at Appendix A), has quantified a loss of floodplain storage equal to 90m³, compensation for which can be accommodated on a volume for volume basis by removing part of the existing Ascot Road embankment, with mitigation works secured via the addition of a requirement that is included in the amended Draft DCO submitted at Deadline III. A level for level compensation solution will be further explored during the detailed design stage and will be provided where it can be achieved within the Order limits and with no worse environmental affects, subject to approval by the Secretary of State and the Environment Agency.

9. **1.5 - RR ISSUE 1.5 – WIDENING OF THE THAMES BRAY UNDERBRIDGE**

9.1 1.5.1 - Our RR state:

"The FRA states "Widening of the Thames Bray underbridge would result in a total river bed displacement of 50m². The impact of this displacement is considered to be negligible. However, to minimise the impact on any hydraulic conveyance capacity of the river, if required, mitigation measures such as floodplain compensation may be provided. The need for such floodplain compensation will be confirmed during the detailed design phase."

If not appropriately compensated for the increase in built footprint may reduce flood storage and also impact on flood conveyance thereby increasing the risk to others. If losses of floodplain storage have not been properly quantified then we cannot be certain that flood risk will not increase as a result of the proposed works.

EA proposed solution 1.5: The applicant in the FRA should quantify losses of floodplain storage and demonstrate that there is sufficient space on site to be able to provide level for level compensation to demonstrate no loss of floodplain storage up to the 1 in 100 year with an allowance for climate change flood level."

9.2 1.5.2 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

9.2.1 Confirmatory FpC assessments have been completed since the DCO Application was submitted and additional information was provided to the Environment Agency on 30 September and 26 October 2015.

9.2.2 A FpC assessment has been completed at the Thames Bray site and the results (reported in paragraphs 5.1.23 to 5.1.25 of the updated FRA at Appendix A) demonstrate that a floodplain storage loss equal to 113m³ due to widening of the bridge can be compensated for on a volume for volume basis for all flood events up to and including the 1 in 100 year plus climate change

event. With the proposed mitigation measures in place, the works at this location are considered to have no impact on flood risk.

10. 1.6 - RR ISSUE 1.6 - SIDE ROAD WORKS - MARSH LANE

10.1 1.6.1 - Our RR state:

"The FRA states 'The works at Marsh Lane were assessed against EA flood modelling which shows that there will not be a significant change between existing and proposed flood extent.' The FRA does not explain what these works are and what the loss of floodplain storage could be. The FRA only states this will 'not be significant', the NPPF and the NPS on National Networks requires there to be no increase in flood risk.

If no mitigation is proposed then the works could potentially increase flood risk upstream and downstream.

EA proposed solution 1.6: The proposed works need to be explained fully. The FRA also needs to adequately demonstrate that there will be no increase in flood risk."

10.2 1.6.2 - As noted in our RR the FRA does not clearly state what the works will be or how it is deemed not to result in significant change between existing and proposed flood extents. Any increase in flood risk is generally not acceptable. Even if it is deemed to be a small increase in flood risk at this location, the scale of the works the potential cumulative impacts on flood risk need to be taken into consideration and satisfactory mitigation must be proposed and implemented.

Highways England Comment

10.2.1 Marsh Lane is an unclassified road linking Dorney and Dorney Reach to the south with the A4, Bath Road, to the north. The existing road crosses the M4 on a four span overbridge, the abutments of which cause a short discontinuity to both hard shoulders of the M4.

10.2.2 Highways England confirms that the proposed works at Marsh Lane comprise demolishing the existing structure and constructing a longer single span overbridge on full height abutments on the existing road alignment. This on line construction will minimise land take and the proposal of a single span structure will remove the requirement to construct a bridge pier in the centre

reserve of the motorway, thereby reducing the construction time required and minimising the disruption caused by the works.

10.2.3 Following the confirmatory assessment undertaken by Highways England, the results of which are presented in Annex E and paragraph 5.1.25 of the updated FRA (provided at Appendix A), Highways England can confirm that the works at Marsh Lane do not encroach into Flood Zone 3, the limits of which have been defined using Environment Agency Product 4 flood level and local topography data. There is therefore no potential for fluvial flood risk impacts at this location because Scheme works will not impede/impact upon the existing storage or movement of floodwaters within the 1 in 100 year plus climate change floodplain (Flood Zone 3), and mitigation is not therefore required.

10.3 *1.6.3 - Without the appropriate assessment and subsequent completion of satisfactory FpC prior to the commencement of the remaining works it is likely that the proposed development would result in increasing flood risk onsite or elsewhere. Additionally, construction works alone without the appropriate compensation may increase flood risk through the impendence of flood water flows.*

Highways England Comment

10.3.1 The updated FRA provided at Appendix A identifies where FpC is required and demonstrates that it can be satisfactorily provided so that there will be no increase in flood risk as a result of the Scheme. The FpC identified as being required is secured, via the requirement for a Flood Compensation Strategy, pursuant to a requirement in the DCO.

10.4 *1.6.4 - We view any increase in flood risk or impendence of flood water flows to be detrimental to people and the environment. Our position is supported by paragraphs 5.99 and 5.109 of the NPSNN.*

Highways England Comment

10.4.1 Highways England acknowledges the detrimental impact of flooding on people and the environment and has incorporated measures into the design of the Scheme to ensure no adverse flood risk impacts are caused, both during construction and operational phases. These measures include provision of

compensation for any losses of storage within the 1 in 100 year plus climate change floodplain and a drainage design based on the principle of no net increase in baseline discharge rates of surface water runoff to ensure that flood risk will not be increased elsewhere and that there would be no increase in flood risk to the Scheme itself, in line with the requirements of paragraph 5.99 of the NN NPS. Further, as explained above, FpC will be provided where the updated FRA (provided at Appendix A) has identified it is required and will be designed to ensure no impence of flood water flows, pursuant to a requirement in the DCO. Also, in line with the requirements of paragraph 5.100 of the NN NPS, mitigation measures, such as the provision of attenuation storage (a form of SUDS), are included to secure the principle that the Scheme will not produce additional discharge in flow rate or volume at outfalls and that maintenance responsibilities for drainage systems will be the responsibility of Highways England's maintenance service provider (currently their Area 3 Asset Support Contract and Area 5 Design Build Finance and Operate contracts). Details of how the future operation and maintenance of the drainage systems will be secured is provided in Chapter 10 of the updated FRA at Appendix A to this Response.

10.4.2 Consequently, Highways England is of the view that the Scheme is compliant with the requirements of the NN NPS, including those at paragraphs 5.99-5.100.

10.5 *1.6.5 - At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

10.5.1 Additional information was provided to the Environment Agency in the form of a technical note issued on 30 September 2015 and a further update was provided to the Environment Agency on 28 October 2015 in the form of an updated FRA. The updated FRA, which is provided at Appendix A, confirms

that sufficient floodplain compensation areas are available and details what form of compensation will be provided. Compensation is to be provided on a mixed level for level and volumetric basis. As noted above, a requirement has been included in the Draft DCO submitted at Deadline III to ensure the implementation of required flood water storage. In line with the Environment Agency's requirements, the flood compensation scheme will include details of the phasing of flood compensation in accordance with the phasing of construction of the Scheme as set out in flood compensation scheme. The requirement in the DCO also provides that construction of any scheduled work within any part of the 1 in 100 year plus climate change floodplain shall not be commenced until the approved flood compensation scheme for that phase has been completed.

11. 1.7 - RR ISSUE 1.7 - SIDE ROAD WORKS - MONKEY ISLAND LANE

11.1 1.7.1 - Our RR state:

"The proposed works to Monkey Island Lane and Monkey Island Lane overbridge include works within the within the 1 in 100 with an allowance for climate change flood extent. These works include a new earthwork embankment for Monkey Island Lane and the associated realignment of the flood relief channels running parallel to the M4.

The FRA state "Current designs indicate that 2000m² of works to the new embankment are located within the floodplain. Mitigation is proposed by removal of the existing embankment is 3300m². However, the FRA does not demonstrate that compensation can be achieved on a level for level basis. The FRA states 'the precise arrangement of any required floodplain compensation will be confirmed following further assessment during the detailed design phase.

If not appropriately compensated for the increase in built footprint may reduce flood storage and potentially impact on flood conveyance thereby increasing the risk to others. If losses of floodplain storage have not been properly quantified then we cannot be certain that flood risk will not increase as a result of the proposed works.

EA proposed solution 1.7: Where land raising is proposed within the floodplain then the flood risk assessment should quantify the amount of floodplain storage lost to the development and provide compensation to mitigate for this on a level for level basis. The compensation areas

should be provided in hydrologically and hydraulically linked areas to ensure that there is no increase in flood risk upstream or downstream."

- 11.2 1.7.2 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

11.2.1 The updated FRA (paragraphs 5.1.27 and 5.1.28) provided at Appendix A has quantified that the proposed works at Monkey Island Lane result in a floodplain storage loss of 1125m³ and that compensation for this loss on a volumetric equivalent and level for level basis can be accommodated by removing part of the existing Monkey Island Lane embankment.

11.2.2 As noted above, a requirement has been included in the Draft DCO submitted at Deadline III to ensure the implementation of required flood compensation within the timescales required by the Environment Agency.

12. 1.8 - RR ISSUE 1.8 - SIDE ROAD WORKS - WOOD LANE

12.1 1.8.1 - Our RR state:

"The proposed works to Wood Lane and Wood Lane overbridge include a new earthwork embankment within the 1 in 100 with an allowance for climate change flood extent. Current designs indicate that 2100m² of works to the new embankment is located within the floodplain.

The FRA states "Mitigation to compensate for any loss of floodplain as a result of these works can be provided by removal of part of the existing Wood Lane embankment to create floodplain compensation. The indicative flood storage area available by removal of the existing embankment is 4000m². The FRA does not demonstrate that compensation can be achieved on a level for level basis.

The FRA states "the precise arrangement of any required floodplain compensation will be confirmed following further assessment during the detailed design phase.

If not appropriately compensated for the increase in built footprint may reduce flood storage and potentially impact on flood conveyance thereby increasing the risk to others. If losses of floodplain storage have not been properly quantified then we cannot be certain that flood risk will not increase as a result of the proposed works.

EA proposed solution 1.8: Where land raising is proposed within the floodplain then the flood risk assessment should quantify the amount of floodplain storage lost to the development and provide compensation to mitigate for this on a level for level basis. The compensation areas should be provided in hydrologically and hydraulically linked areas to ensure that there is no increase in flood risk upstream or downstream."

- 12.2 1.8.2 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

12.2.1 The updated FRA (paragraphs 5.1.37 and 5.1.38) provided at Appendix A has quantified that the proposed works at Wood Lane result in a floodplain storage loss of 150m³ and that compensation for this loss on a volumetric equivalent basis can be provided. A level for level compensation solution will be further explored during the detailed design stage of the Scheme and will be provided where it can be achieved within the Order limits and with no worse environmental affects, subject to approval by the Secretary of State and the Environment Agency.

12.2.2 As noted above, a requirement has been included in the Draft DCO submitted at Deadline III to ensure the implementation of required flood compensation within the timescales required by the Environment Agency.

13. 1.9 - RR ISSUE 1.9 - SIDE ROAD WORKS - RIDINGS COURT ROAD

13.1 1.1.9 - Our RR state:

The proposed works to Riding Court Road and Riding Court Road overbridge include a new earthwork embankment within the 1 in 100 with an allowance for climate change flood extent.

The FRA states 'Current designs indicate that 800m² of works to the new embankment are located within the floodplain. The proposed works to Wood Lane and Wood Lane overbridge include a new earthwork embankment within the 1% climate change AEP flood extents. Current designs indicate that 2100m² of works to the new embankment are located within the floodplain. Mitigation to compensate for any loss of floodplain as a result of these works can be provided by removal of part of the existing Wood Lane embankment to create floodplain compensation. The indicative flood storage area available by removal of the existing embankment is 4000m².'

The FRA does not demonstrate compensation can be achieved on a level for level basis. The FRA states "the precise arrangement of any required floodplain compensation will be confirmed following further assessment during the detailed design phase.

If not appropriately compensated for the increase in built footprint may reduce flood storage and also potentially impact on flood conveyance thereby increasing the risk to others. If losses of floodplain storage have not been properly quantified then we cannot be certain that flood risk will not increase as a result of the proposed works.

Where land raising is proposed within the floodplain then the flood risk assessment should quantify the amount of floodplain storage lost to the development and provide compensation to mitigate for this on a level for level basis. The compensation areas should be provided in hydrologically and hydraulically linked areas to ensure that there is no increase in flood risk upstream or downstream."

13.2 1.9.2 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

13.2.1 The updated FRA (paragraphs 5.1.46 and 5.1.47) provided at Appendix A has quantified that the proposed works at Ridings Court Road result in a floodplain storage loss of 49m³ and that compensation for this loss on a volumetric equivalent basis can be provided. A level for level compensation solution will be further explored during the detailed design stage of the Scheme and will be provided where it can be achieved within the Order Limits and with no worse environmental affects, subject to approval by the Secretary of State and the Environment Agency.

13.2.2 As noted above, a requirement has been included in the Draft DCO submitted at Deadline III to ensure the implementation of required flood compensation within the timescales required by the Environment Agency.

14. 1.10 - RR ISSUE 1.10 - M4 JUNCTIONS 5 TO 4B SIDE ROAD - OLD SLADE LANE

14.1 1.10.1 - Our RR state:

"The FRA states "The works at Old Slade Lane were assessed against EA flood modelling which shows that there are no significant changes between existing and proposed road alignment extent and as such mitigation measures will not be required." The FRA does not quantify "significant". The NPPF and the NPS on National Networks requires there to be no increase in flood risk.

If no mitigation is proposed then the works could potentially increase flood risk upstream and downstream. This is contrary to national planning policy.

EA proposed solution 1.10: The proposed works need to be explained fully. The FRA also needs to adequately demonstrate that there will be no increase in flood risk."

14.2 1.10.2 - *As noted in paragraph 1.10.1 the FRA does not clearly state how the works are deemed not to result in significant change between existing and proposed flood extents. Any increase in flood risk is generally not acceptable. Even if it is deemed to be a small increase in flood risk at this location, the scale of the works the potential cumulative impacts on flood risk need to be taken into consideration and satisfactory mitigation must be proposed and implemented.*

Highways England Comment

14.2.1 Highways England can confirm that the works at Old Slade Lane comprise replacing the existing overbridge with a longer span bridge, as discussed at paragraph 7.8.25 of the Engineering and Design Report (Application Document Reference 7-3) and as shown on the overbridge general arrangement drawing is included in Annex F of the Engineering and Design Report (Application Document Reference 7-4).

14.2.2 Following a confirmatory assessment, the results of which are presented in paragraph 5.1.57 and Annex E of the updated FRA (provided at Appendix A), Highways England can confirm that the works at Old Slade Lane do not encroach into Flood Zone 3, the limits of which have been defined using Environment Agency Product 4 flood level and local topography data. There is therefore no potential for fluvial flood risk impacts associated with works at this location, and mitigation is not required.

14.3 *1.10.3 - Without the appropriate assessment and subsequent completion of satisfactory FpC prior to the commencement of the remaining works it is likely that the proposed development would result in increasing flood risk onsite or elsewhere. Additionally, construction works alone without the appropriate compensation may increase flood risk through the impence of flood water flows.*

Highways England Comment

14.3.1 The appropriate assessment of the potential for flood risk impacts due to works at this location has been undertaken and the results, reported in paragraph 5.1.57 of the updated FRA (provided at Appendix A) confirm that there would be no loss of storage or impence of flood water flows within the 1 in 100 year plus climate change floodplain. The requirement, which secures the provision of flood compensation pursuant to a flood compensation scheme to be approved in consultation with the Environment Agency, provides that construction of any scheduled work within any part of the 1 in 100 year plus climate change floodplain shall not be commenced until the approved flood compensation scheme for that phase has been completed.

14.4 1.10.4 - *At the time of writing we are still waiting to receive the additional information. Providing the new information demonstrates that flood risk will not be increased and that sufficient floodplain compensation areas are available, including what form of compensation will be provided ("level for level", "volumetric", etc...) we anticipate that we will be able to agree a mechanism to secure the implementation and completion of the required flood water storage within the appropriate phasing timetables during the course of the examination. We will jointly provide a copy of these to the ExA once finalised.*

Highways England Comment

14.4.1 Additional information was provided to the Environment Agency in the form of a technical note issued on 30 September 2015 and a further update was provided to the Environment Agency on 28 October 2015 in the form of an updated FRA (provided at Appendix A) which confirm that flood risk mitigation works at this location are not required. As noted above, the implementation and completion of the requirement flood compensation is to be secured by way of a requirement in the DCO. The wording of that requirement has been shared with the Environment Agency and Highways England looks forward to receiving its comments in relation to the wording provided.

15. 2.0 - WORKS TO CULVERTS OVERVIEW

15.1 2.0.1 - *Within our relevant representations (RR-249) we sought clarification and additional evidence regarding the proposed works to existing culverts associated with the scheme.*

15.2 2.0.2 - *We noted that:*

"the applicant is proposing work to existing culverts but has not specified the extent of work required. They explain they will be extending them but the supplied information does not explain the lengths or design. If extensions to culverts are not designed appropriately they can increase flood risk and impact on biodiversity.

The detailed design needs to show that the culverts will be accessible and allow passage for the wildlife that needs to use them. This should include otters that are likely to be using all watercourses, including small or dry ditches. We would want to see improvements to any existing culverts, e.g. to make them passable to fish if they are not already.

Culverts should be designed in accordance with Ciria C689. There is also the following guidance, which we recommend is used in the design process:

- *"Structural modification of culverts design guidance" at <http://evidence.environmentagency.gov.uk/FCERM/en/SC060065/MeasuresList/M7/M7T1.aspx?pagenum=2>*
- *Chapter 8.6 of the Environment Agency "Fluvial Design Guide", which is at <http://evidence.environmentagency.gov.uk/FCERM/en/FluvialDesignGuide/Chapter8.aspx?pagenum=6>*

In addition, any additional hard bank protection such as sheet piling, where there was previously natural bank, will also require our consent (if main river) and will also need to be mitigated/compensated for. We would therefore wish to be able to review all final proposals through the detailed design phase."

- 15.3 2.0.3 - *Within the submitted application documents including "7.3 Engineering and design report", dated March 2015, revision 0 (APP-096), there is the misuse and interchanging of terms widening, extending and lengthening. This has resulted in some confusion of what works are intended at each culvert location. For example, 7.6.34 of the Engineering and design report refers to Chalvey culvert being symmetrical widening 4m (a total distance of 8 metres) where-as 7.7.44 of the same document refers to Ashley's Arch culvert being lengthened by 1.5m to the north.*

Highways England Comment

15.3.1 The terms used by Highways England for culvert alterations are generally adopted from the terms used for bridges:

- Lengthening: Length of a bridge refers to the bridge span i.e. distance between the abutments. For a box culvert this would correspond to the width of the box. Lengthening therefore refers to increasing the number or length of the bridge spans. This is not proposed for any culverts on the Scheme.*
- Widening: Width of a bridge refers to the distance between the parapet edge beams. For a culvert this would refer to the length of the culvert bore.*

- 15.3.2 There are only two culverted watercourses classed as main rivers where the culverts will be altered by the Scheme:
- i. Chalvey Culvert, west of junction 6 and shown as work number 15 on sheet 21 of the Works Plans (Application Document Reference 2.3). This is a 3.66m span box culvert which will be widened at each end to accommodate all lane running. Details of the proposed design can be seen in the general arrangement drawing in Annex F2 of the EDR (Application Document Reference 7.4), which shows culvert bore extensions of 2.91m to the north and 3.43m to the south.
 - ii. Ashleys Arch Culvert, between junction 5 and Riding Court Road Overbridge and shown as work number 23b on sheet 24 of the Works Plans. There are two elements to this culvert: a 6.1m span box culvert and a 1.5m diameter pipe culvert. No alterations are proposed for the box culvert but the pipe culvert will be widened to the north to accommodate all lane running. Details of the proposed design can be seen in the general arrangement drawing in Annex F2 of the EDR which shows culvert bore extension of 1.2m to the north.
- 15.3.3 With regards to requirements for the culvert design, Highways England are only required to mitigate the effects of the Scheme and not to provide improvements to the current situation. Thus in both these cases the aperture, or bore size, of the culvert will be maintained as existing and therefore the wildlife access arrangements will be maintained. However, Highways England proposes that an otter ledge will be installed within Chalvey and Ashley's Arch Culvert, and these proposals will be consulted on with the Environment Agency in accordance with Requirement 28 of Schedule 2 to the DCO submitted at Deadline III.
- 15.3.4 Highways England confirms that alterations to the culverts will be designed in accordance with DMRB requirements.
- 15.3.5 Highways England understands the need to consult with and gain approval from Environment Agency when considering and designing changes to watercourses and culverts, as secured by paragraph 13.2.1 of the outline CEMP. Highways England will continue to engage in further meaningful detailed, technical discussions with the Environment Agency during the

detailed design stage, with a view to further informing the final design to ensure that it will be acceptable to the Environment Agency. Highways England notes that the detailed design will need to show that the culverts will be accessible and allow passage for wildlife, including otters, and shall discuss appropriate improvements to any existing culverts with the Environment Agency.

15.4 2.0.4 - *The widening of any culvert without appropriate mitigation can lead to an increase in flood risk downstream as a larger volume of water can pass through the opening in a shorter time. Similarly the lengthening of a culvert can result in increased flood risk upstream as the water is contained within the culvert/pipe for a longer period and consequently "backs-up" behind the surcharged opening. In either case, in accordance with paragraphs 5.99 and 5.109 of the NPSNN it is for the applicant to clearly assess and demonstrate that they are not increasing flood risk elsewhere.*

Highways England Comment

- 15.4.1 Highways England confirms that only the length of the existing Chalvey and Ashley's Arch Culverts will be extended, with no change proposed to their width or height. As detailed in paragraphs 5.1.39 and 5.1.48 of the updated FRA (provided at Appendix A), downstream flood risk will not therefore increase as the same volume of water will pass through the culvert openings at the same rate as in the existing situation.
- 15.4.2 Potential for increased flood risk upstream of the culverts due to water being contained within the lengthened culverts for a longer period and floodwater consequently "backing-up" and increasing flood water levels upstream will be mitigated by adopting best practice culvert design to ensure the hydraulic efficiency of water entry to and flow through the structure and, if required, by provision of a floodplain storage at the upstream culvert entrance to ensure that any minor increases in water levels upstream of the culvert do not result in an in flood risk to third party lands. As a result, there will be no increase in flood risk resulting from the culvert extension works.
- 15.4.3 Highways England confirms that all relevant consents would be sought from the Environment Agency for the culvert extension works, and due to the nature of the works (increasing bore length only) and the mitigation included in the design, there will be no increase to upstream or downstream flood risk.

15.5 2.0.5 - *Furthermore, the extension of culverts will result in the loss of river bed, channel and bank that provide a natural habitat for various species. These often form vital parts of green and blue infrastructure corridors. If appropriate off-setting and/or other measures are not proposed and implemented this could result in a net loss of natural habitat. This would be contrary to the aims of paragraphs 5.20 to 5.26 of the NPSNN.*

Highways England Comment

15.5.1 Small areas of watercourse habitats will be lost due to works at the Chalvey Culvert (6.34m additional culvert length), Ashley's Arch Culvert (additional 1.2m culvert length) and Thames Bray Bridge (7.8m widening). However, the impact of the loss of in-channel habitats has been assessed as not significant. This conclusion is largely based on the small area of channel affected, approximately 22m², 4.5m², and 50m² respectively. No direct replacement of in-channel habitats has been proposed but, in compliance with national policy including the NN NPS, opportunities for ecological enhancement measures have been sought (including the provision of: wildflower seed mix for grassland reinstatement; native trees for tree planting; otter ledges at culverts or underbridges; 60 bat boxes; 40 bird boxes; and the removal of invasive species) to maximise the biodiversity benefits of the Scheme (see paragraph 9.4.117 of the ES (Application Document Reference 6.1)). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES.

15.6 2.0.6 - *Following discussions with HE, including at a meeting on 25 September 2015, it was verbally clarified that in all such instances, they are proposing to lengthen culverts rather than widening them. Furthermore, the requirement of providing further evidence and assessment of the impacts of the lengthened culverts on flood risk, loss of river bed, channel and banks, mammal passage and the provision of suitable off-setting measures and culvert maintenance plan were discussed.*

15.7 2.0.7 - *We anticipate that upon receipt of further information and satisfactory evidence as referred to within the section 2.1 to 2.3, we will be able to agree appropriate off-setting and/or alternative mitigation measures. We expect that these may be secured through the DCO or other appropriate consents. We will jointly provide a copy of our agreed position to the ExA once finalised.*

Highways England Comment

- 15.7.1 Highways England welcomes Environment Agency's confirmation that Environment Agency anticipates full agreement upon receipt of further information. Further information documented in the updated FRA and associated drawings was provided to, and discussed at a meeting with, the Environment Agency on 28 October 2015.
- 15.7.2 That evidence demonstrated that the impact on flood risk of the culverts to be lengthened as part of the Scheme is negligible is provided in paragraphs 5.1.48 and 5.1.39 of the updated FRA provided at Appendix A to this Response. Further, as explained above, only small areas of watercourse habitats will be lost due to works at the Chalvey Culvert (6.34m additional culvert length), Ashley's Arch Culvert (additional 1.2m culvert length) and Thames Bray Bridge (7.8m widening). However, the impact of the loss of in-channel habitats has been assessed as not significant in the ES. This conclusion is largely based on the small area of channel affected, approximately 22m², 4.5m², and 50m² respectively.
- 15.7.3 The impact of the Scheme works on mammal passage (predominantly otters) has been assessed in paragraph 9.4.91 of the ES, which states that the residual effect across the Scheme on otters is considered to be neutral, owing to the retention of suitable habitat and minimal disturbance envisaged.
- 15.7.4 As explained above, whilst no direct replacement of in-channel habitats has been proposed, in compliance with national policy including the NN NPS, alternative mitigation measures and opportunities for ecological enhancement measures have been sought (including the provision of: wildflower seed mix for grassland reinstatement; native trees for tree planting; otter ledges at culverts or underbridges; 60 bat boxes; 40 bird boxes; and the removal of invasive species) to maximise the biodiversity benefits of the Scheme (see paragraph 9.4.117 of the ES (Application Document Reference 6.1)). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES.
- 15.7.5 Further to the discussions on 25 September 2015 regarding the culvert maintenance plan, Highways England confirm that ongoing responsibility for maintenance of the culvert will be agreed with the relevant Highways England maintenance provider or Local Authority and this agreement will be

documented with the finalised Handover Environmental Management Plan on completion of each phase of the construction works.

15.8 *Specific culverting issues are considered below.*

16. 2.1 - RR ISSUE 2.1 – FROGS DITCH (JUNCTIONS 4 AND 3)

16.1 2.1.1 - *Our RR state:*

"Section 5.1.61 of the FRA indicates that work is needed on the Frogs ditch located between junctions 4 and 3. The Frogs ditch is classified as a main river, Highways England will require a flood Defence Consent to carry out any works within 8m of the watercourse. The FRA states that the existing ditch can be made hydraulically contiguous with upstream and downstream ditches by installing pipe culverts where required. We are generally opposed to the culverting of watercourses.

Other than the paragraph in section 5.1.61 we cannot find any further information on the proposed works to the Frog's ditch (Main River). Culverts if not designed appropriately can increase flood risk.

EA proposed solution 2.1: Justification needs to be provided as to why culverting is required in this location. If culverting is the only option then the impact that this will have on flood risk needs to be considered within the FRA e.g. the length of culverting proposed, the dimensions of the proposed culvert supported by hydraulic analysis, culvert maintenance plan and mammal passage."

16.2 2.1.2 - *At our meeting on 25 September 2015 HE stated that they believed they would no longer need to carry out culverting works at Frogs Ditch. This position was based on information they had received from further land survey work. It indicated that the current landscape was able to facilitate the proposed works. However, this was subject to a further site inspection. It was agreed that if this position was confirmed, HE would confirm this in writing to us and the ExA. At the time of writing, no confirmation has been received.*

Highways England Comment

16.2.1 Highways England confirms that, as detailed in paragraph 5.1.63 of the updated FRA (provided to the Environment Agency on 26 October 2015 and included as Appendix A to this response), culverting of the Frogs Ditch is not required to accommodate the Scheme.

17. 2.2 - RR ISSUE 2.2 - CHALVEY CULVERT

17.1 2.2.1 - Our RR state:

"The submitted FRA states that "The Chalvey culvert on the Chalvey Ditch is to be extended to accommodate the Scheme. As the works involve extending the existing culvert, the impact on the surrounding floodplain will be negligible and as such mitigation measures will not be required." Furthermore, the Engineering and design report (APP-096) notes in paragraphs 7.6.34 to 7.6.35 that this culvert will be lengthen by a total of 8 metres (4m either side of the existing highway)."

17.2 2.2.2 - However the application documents have not assessed the potential impacts of the proposed works on the culvert and whether any mitigation would be required to ensure that there would be no increase in flood risk or loss of important habitat. The details noted above and in paragraph 3.3.35, annex 1-A of EIA appendix 9.1 and sheet 46 of drawing 9.2 refer to the bank vegetation in the locality and do not appear to consider the potential loss of channel bed and how this will be addressed.

Highways England Comment

17.2.1 Highways England confirms that only the length of the existing Chalvey Culvert will be extended, with no change proposed to its existing width or height. As detailed in paragraph 5.1.39 of the updated FRA, which is provided at Appendix A, downstream flood risk will not therefore increase as the same volume of water will pass through the culvert opening at the same rate as in the existing situation.

17.2.2 Potential for increased flood risk upstream of the culvert due to water being contained within the lengthened culvert for a longer period and floodwater consequently "backing up" and increasing flood water levels upstream will be mitigated for by adopting best practice culvert design to ensure the hydraulic efficiency of water entry to and flow through the structure and, if required, by provision of floodplain storage at the upstream culvert entrance to ensure that any minor increases in water levels upstream of the culvert do not result in an in flood risk to third party lands.

17.2.3 As a result, there will be no increase in flood risk resulting from the culvert extension works. All relevant consents will be sought from the Environment

Agency for the culvert extension works, as set out in the report on the Details of other consents and licences (Application Document Reference 5-5), and due to the nature of the works (increasing bore length only) and the mitigation included in the design, there will result in no increase to upstream or downstream flood risk.

17.2.4 In relation to loss of habitat please see the Highways England response at paragraphs 24.3.1 to 24.3.8, below.

17.3 2.2.3 - *Justification needs to be provided as to why culverting is required in this location. If culverting is the only option then the impact that this will have on flood risk needs to be considered within the FRA. For example, the length of culverting proposed, the dimensions of the proposed culvert supported by hydraulic analysis, culvert maintenance plan and mammal passage."*

Highways England Comment

17.3.1 Provision of all lane running ("ALR") on the M4 and the associated realignment of junction 6 slip roads (Work Numbers 16a and 16d) result in an increase in the overall carriageway width of the M4 at the point where it passes over Chalvey Culvert. It is therefore necessary to increase the length of the existing Chalvey Culvert (Work Number 15) to accommodate ALR on the M4. Details of the proposed alterations to the culvert are included in paragraph 15.3.3(i) above. No other alternative is available to accommodate the widening of the carriageway in the location of Chalvey Culvert, apart for that which is proposed as part of the Scheme.

17.3.2 As discussed in paragraph 17.2.1, as only the length of the existing Chalvey Culvert will be extended, with no change proposed to its existing width or height, downstream flood risk will not increase as the same volume of water will pass through the culvert opening at the same rate as in the existing situation. Potential for increased flood risk upstream of the culvert due to water being contained within the lengthened culvert for a longer period and floodwater consequently "backing up" and increasing flood water levels upstream will be mitigated by for by adopting best practice culvert design to ensure the hydraulic efficiency of water entry to and flow through the structure and, if required, by provision of floodplain storage at the upstream culvert entrance to ensure that any minor increases in water levels upstream of the culvert do not result in an in flood risk

to third party lands. As a result there will be no increase in flood risk resulting from the culvert extension works.

17.4 2.2.4 - *Without evidence demonstrating that flood risk will not be increased elsewhere as a result of culvert works it is difficult to ensure that people and the environment will not be placed at risk. As noted in paragraph 2.0.4 of this statement the lengthening of a culvert can result in increased flood risk upstream as the water is contained within the culvert/pipe for a longer period and consequently 'backs-up' behind the surcharged opening. In accordance with paragraphs 5.99 and 5.109 of the NPSNN it is for the applicant to clearly assess and demonstrate that they are not increasing flood risk elsewhere. Flooding can result in negative economic and social impacts including travel disruption and in more significant events pose a risk to people's lives.*

Highways England Comment

17.4.1 Highways England acknowledges the economic and social impacts that flooding can have on people's lives. Highways England therefore confirms that the potential flood risk for the Scheme has been assessed appropriately in accordance with the National Planning Policy Framework ("NPPF") and NN NPS as documented in the FRA and paragraphs 5.1.39 and 5.1.48 of the updated FRA, provided at Appendix A. The information provided therefore demonstrates that the proposed development satisfies the requirements of the Sequential and Exception Tests (as discussed in Chapter 3 of the updated FRA) and that flood risk from any source will not be increased elsewhere as a result of the Scheme in line with the requirements of paragraph 5.99. Also the Scheme will result in no net loss of floodplain storage (for all events up to and including the 1 in 100 year plus climate change flood) nor impede existing flow routes across the floodplain in line with the requirements of paragraph 5.109 of the NN NPS. █

17.5 2.2.5 - *Furthermore, without an appropriate assessment of the permanent loss of river habitats resulting from the lengthening of the culvert it is unclear what biodiversity off-setting and/or other mitigation measures may be required to compensate for such losses.*

Highways England Comment

17.5.1 Within the Ecology and Nature Conservation assessment (Chapter 9 of the ES; Application Document Reference 6.1), river habitats are included under the receptor heading 'Habitats and plants'. The effects of the Scheme on all habitats

and plants, including river habitats, has been assessed as 'Neutral'. Additional detail on the assessment is provided within this response at paragraphs 23.1-23.3.9.

17.5.2 No direct replacement of in-channel habitats has been proposed because the amount of in-channel habitat to be lost to the Scheme is minimal. However, in compliance with national policy including the NN NPS, opportunities for ecological enhancement measures have been sought (including the provision of otter ledges at culverts or underbridges) to maximise the biodiversity benefits of the Scheme (see paragraph 9.4.117 of the ES). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES.

17.6 *2.2.6 - River beds, channel and banks provide a natural habitat for various species. These often form vital parts of green and blue infrastructure corridors. If appropriate off-setting and/or other measures are not proposed and implemented this could result in a net loss of natural habitat. Paragraph 5.25 of the NPSNN states that 'development should avoid significant harm to biodiversity and geological conservation interests, including through mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity off-setting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated.'*

Highways England Comment

17.6.1 The works to Chalvey Culvert will require the extension of the culvert by 4m on either side of the culvert (see paragraphs 7.6.34 to 7.6.35 of the Engineering and Design Report (Application Document Reference 7-3)).

17.6.2 Highways England considers that the works will not result in significant harm to biodiversity, as only 22m² will be affected, and the species found in the ditch habitats are common species, including willow, nettle, yellow flag iris, dock and the invasive weed Himalayan balsam. The loss of these species will not affect the biodiversity of streams and ditches in the study area and within the assessment, the effect of the Scheme upon habitats and plants is considered to be 'Neutral' (see paragraph 9.4.25 of the ES (Application Document Reference 6.1)). Consequently, Highways England is of the view that the Scheme is in compliance with paragraph 5.25 of the NN NPS.

17.7 2.2.7 - *We anticipate that upon receipt of further information and satisfactory evidence demonstrating that lost habitat will be compensated for and that flood risk will not be increased that we will be able to agree appropriate off-setting and/or alternative mitigation measures for these culvert works. We expect that these may be secured through the DCO or other appropriate consents. We will jointly provide a copy of our agreed position to the ExA once finalised.*

Highways England Comment

17.7.1 The works to Chalvey Culvert will require the extension of the culvert by 4m on either side of the culvert (see paragraphs 7.6.44 to 7.6.35 of the EDR).

17.7.2 Highways England considers that the impact assessment in relation to habitat losses, including in-channel habitats, is appropriate. The impact of the loss of watercourse habitats, including channel bed, has been assessed as not significant. This conclusion is largely based on the small length (8m) of channel affected. No direct replacement of in-channel habitats has been proposed but, “in compliance with national policy including the NN NPS, opportunities for ecological enhancement measures have been sought to maximise the biodiversity benefits of the Scheme” (see paragraph 9.4.117 of the ES). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES, and include the provision of: wildflower seed mix for grassland reinstatement; native trees for tree planting; otter ledges at culverts or underbridges; 60 bat boxes; 40 bird boxes; and the removal of invasive species).

18. 2.3 - RR ISSUE 2.3 - ASHLEY ARCH CULVERT

18.1 2.3.1 - *Our RR state:*

"The Ashley Arch on Datchet Common Brook is proposed to be extended. The FRA states "As the works involve extending the existing culvert, the impact on the surrounding floodplain will be negligible and as such mitigation measures will not be required." Furthermore, the Engineering and design report (APP-096) notes in paragraphs 7.7.44 that this culvert will be lengthen by a total of 1.5 metres."

18.2 2.3.2 - *However the application documents have not satisfactorily assessed the potential impacts of the proposed works on the culvert and whether any mitigation would be required to ensure that there would be no increase in flood risk or loss of important habitat. The details noted above and in 3.3.35, annex 1-A of EIA appendix 9.1 and sheet 54 of drawing 9.2 refer to the bank vegetation in the locality and do not appear to consider the potential loss of channel bed and how this will be addressed.*

Highways England Comment

18.2.1 The works to Ashley's Arch Culvert will require the extension of the culvert by 1.5m.

18.2.2 Highways England considers that the impact assessment in relation to habitat losses, including in-channel habitats, is appropriate. The impact of the loss of watercourse habitats, including channel bed, has been assessed as not significant. This conclusion is largely based on the small length (1.5m) of channel affected. No direct replacement of in-channel habitats has been proposed but, "in compliance with national policy including the NN NPS, opportunities for ecological enhancement measures have been sought to maximise the biodiversity benefits of the Scheme" (see paragraph 9.4.117 of the ES). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES and include the provision of: wildflower seed mix for grassland reinstatement; native trees for tree planting; otter ledges at culverts or underbridges; 60 bat boxes; 40 bird boxes; and the removal of invasive species).

18.2.3 Paragraph 5.1.48 of the updated FRA (provided at Appendix A) also assesses the impacts on flood risk and concludes that there would be no increase in flood risk as a result of these works.

18.3 2.3.3 - *Justification still needs to be provided as to why culverting is required in this location. If culverting is the only option then the impact that this will have on flood risk needs to be considered within the FRA. For example, the length of culverting proposed, the dimensions of the proposed culvert supported by hydraulic analysis, culvert maintenance plan and mammal passage.*

Highways England Comment

- 18.3.1 At the point where the M4 crosses over the existing Ashley's Arch Culvert, there is a narrowing of the hard shoulder to the east bound carriageway. Provision of all lane running ("ALR") on the M4 requires an increase in the overall carriageway width of the M4 at this point (Works Number 23a). To accommodate this carriageway widening, there is no alternative option but to increase the length of the existing Ashley's Arch Culvert (Work Number 23b), as proposed in the Scheme. Details of the proposed alterations to the culvert are included in paragraph 15.3.3(ii) above.
- 18.3.2 The works to Ashley's Arch Culvert will require the extension of the 1.5m diameter pipe culvert (relief channel) by 1.5m on the north side (see paragraph 7.7.44 of the EDR). The 6.1m wide box culvert which carries the main channel will remain unchanged.
- 18.3.3 Highways England maintains that the impact of this extension of the 1.5m pipe culvert on flood risk, as documented in paragraph 5.1.48 of the updated FRA (provided at Appendix A), and the effect upon habitats and plants is neutral (see paragraphs 23.1 - 23.3.9 of this response for additional details, and paragraph 9.4.25 of the ES (Application Document Reference 6.1)). With regard to flood risk this is because the same volume of water will pass through the culvert opening at the same rate as in the existing situation, with no impact on downstream flood risk. Potential for increased flood risk upstream of the culvert due to water being contained within the lengthened culvert for a longer period and floodwater consequently "backing-up" and increasing flood water levels upstream will be mitigated by provision of a floodplain compensation scheme.
- 18.3.4 Highways England confirms that an otter ledge will be installed within the culvert to allow for mammal passage, which will be provided pursuant to a scheme to be approved in consultation with the Environment Agency, which is secured by the inclusion of a new requirement in the draft DCO.
- 18.4 2.3.4 - *We anticipate that upon receipt of further information and satisfactory evidence demonstrating that lost habitat will be compensated for and that flood risk will not be increased that we will be able to agree appropriate off-setting and/or alternative mitigation measures for these culvert works. We expect that these may be secured through the DCO or*

other appropriate consents. We will jointly provide a copy of our agreed position to the ExA once finalised.

Highways England Comment

- 18.4.1 The works to Ashley's Arch Culvert will require the extension of the 1.5m diameter pipe culvert (relief channel) by 1.5m on the north side (see paragraph 7.7.44 of the EDR). The 6.1m wide box culvert which carries the main channel will remain unchanged.
- 18.4.2 The impact on flood risk associated with these works has been assessed as negligible, as documented in paragraph 5.1.48 of the updated FRA (provided at Appendix A). Downstream flood risk will not be increased as the same volume of water will pass through the culvert opening at the same rate as in the existing situation. Potential for increased flood risk upstream of the culvert due to water being contained within the lengthened culvert for a longer period and floodwater consequently "backing-up" and increasing flood water levels upstream will be mitigated for by adopting best practice culvert design to ensure the hydraulic efficiency of water entry to and flow through the structure and, if required, by provision of floodplain storage at the upstream culvert entrance to ensure that any minor increases in water levels upstream of the culvert do not result in an in flood risk to third party lands. That mitigation is secured by the provision of a new requirement in the DCO, as explained above.
- 18.4.3 The impact of the loss of watercourse habitats, including channel bed, has been assessed as not significant. This conclusion is largely based on the small length (1.5m) of channel affected. No direct replacement of in-channel habitats has been proposed but, in compliance with national policy including the NN NPS, opportunities for ecological enhancement measures have been sought (including the provision of: wildflower seed mix for grassland reinstatement; native trees for tree planting; otter ledges at culverts or underbridges; 60 bat boxes; 40 bird boxes; and the removal of invasive species) to maximise the biodiversity benefits of the Scheme (see paragraph 9.4.117 of the ES (Application Document Reference 6.1)). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES.

19. 3.0 - WATER QUALITY OVERVIEW

- 19.1 3.0.1 - *As specified in our RR's and repeated in paragraphs 3.0.1 to 3.0.4 below the Environment Agency is the key regulatory authority for implementing and delivering the requirements of the Water Framework Directive (WFD). The purpose of the WFD is to establish a framework for the protection of inland surface waters, transitional waters, coastal waters and groundwater. This directly concerns aquatic and wetland ecosystems, and terrestrial ecosystems dependent on water.*
- 19.2 3.0.2 - *The WFD promotes sustainable water use, based on long term protection of available water resources. It aims to enhance the protection of the aquatic environment, through specific measure for the progressive reduction of discharge, emissions and losses of the priority hazardous substances. It ensures the progressive reduction on pollution of groundwater, as well as contributing to the mitigation of flood and droughts.*
- 19.3 3.0.3 - *The Environment Agency has a duty to exercise its functions so as to secure compliance with the requirements of the WFD. We provide advice and assistance to other bodies to help ensure delivery of the objectives of the WFD. All public bodies have a duty to have regard to the River Basin Management Plan when exercising their functions.*
- 19.4 3.0.4 - *River Basin Management Plans covering specific river basin districts (of which the Thames is one) are produced by the Environment Agency and approved by the Secretary of State every 6 years (the first plan runs from December 2009 to December 2015, the second from December 2015 to December 2021). The River Basin Management Plan sets out the environmental objectives for each water body in the river basin district and the measures to be taken to deliver those objectives over the plan cycle.*
- 19.5 3.0.5 - *In addition, NPSNN paragraph 5.220 states that 'the planning system should contribute to and enhance the natural and local environment by, amongst other things, preventing both new and existing development from contributing to, or being put at unacceptable risk from, or being adversely affected by water pollution. Furthermore, paragraph 5.222 of the NPSNN notes that the applicant should seek to deliver opportunities for WFD through the detailed design of the scheme.*
- 19.6 3.0.6 - *We anticipate that upon receipt of the further information required, so long as it shows that water quality status will not be reduced, we will be able to agree adequacy of the WFDCA and if required, satisfactory mitigation. If any mitigation is required we expect that this could be secured through the DCO or other appropriate consents. If agreement is*

reached through the course of the examination, we will jointly provide a copy of our agreed position to the ExA once finalised.

19.7 *Specific WFD issues are considered below.*

Highways England Comment

19.7.1 Responses to the specific points raised in this overview are provided below.

20. 3.1 - RR ISSUE 3.1 – WFD WATER BODIES TAKEN TO STAGE 4 ASSESSMENT

20.1 *3.1.1 - We acknowledge that 19 surface water bodies and three groundwater bodies have been identified as potentially being impacted by the proposed development. However, within the submitted Water Framework Directive (WFD) compliance assessment (WFDCA) only three of the 19 surface water bodies were taken forward to a stage 4 assessment.*

Highways England Comment

20.1.1 Stage 3 of the WFD Compliance Assessment identified those water bodies, previously identified in Stage 2, which have the potential to be affected by the Scheme (paragraph 6.1.1, Application Document Reference 7.6). Anticipated works within and/or directly adjacent to WFD waterbodies as shown in Table 6.1 of the WFD Compliance Assessment affect the River Thames, Chalvey Ditch and Datchet Common Brook.

20.1.2 The reason, therefore, for only taking forward these three waterbodies to Stage 4, as outlined in paragraph 6.1.3 of the WFD Compliance Assessment, is that construction works associated with the Scheme are only anticipated to have a potential impact on the WFD objectives of these three waterbodies. The remaining waterbodies identified along the Scheme in Table 5.1 of the WFD Compliance Assessment, have been screened out of the preliminary assessment and not taken forward to Stage 4, as it is considered that they do not have the potential to compromise achievement of the WFD objectives in the relevant water bodies (paragraph 6.1.4) of the WFD Compliance Assessment, as works are not proposed within the remaining 16 water bodies and therefore not identified within Table 6.1 of the WFD Compliance Assessment.

20.2 *3.1.2 - We accept that section 7.1.1 of the WFDCA lists a number of criteria used that was used to reach the current number of three. However, the reasons for not taking each of the*

remaining 16 water bodies to stage 4 assessment needs to be included as part of this application.

Highways England Comment

20.2.1 The reason for not taking forward the remaining 16 water bodies to Stage 4 is outlined in paragraph 6.1.4 of the WFD Compliance Assessment (Application Document Reference 7.6): *“All other components are screened out of the preliminary assessment and not taken forward to Stage 4, as it is considered that they do not have the potential to compromise achievement of the WFD objectives in the relevant waterbodies”*. This statement refers to the remaining 16 water bodies (all other components) which do not have the potential to compromise the achievement of the WFD objectives. This is because the baseline will remain unchanged within these 16 water bodies, as shown in Table 5.1 of the WFD Compliance Assessment, as no works are proposed within these water courses as a result of the Scheme. To summarise, the works proposed for the Scheme are not considered to have the potential to cause any effects on the remaining 16 waterbodies, and therefore the conditions within them are expected to remain the same. Works are only proposed within the following water bodies; River Thames at Thames Bray Underbridge, Chalvey Ditch at Chalvey Culvert and Datchet Common Brook and Ashley Arch Culvert. It is these water bodies against which the effects on the WFD objectives for these water bodies have been assessed and no other. The results of this assessment are contained within Stage 4 of the WFD Compliance Assessment.

20.3 *3.1.3 - Without these reasons we consider the WFDCA is not adequate as there may be water bodies and protected areas that are not sufficiently assessed. If those water bodies are not sufficiently assessed then we cannot be certain that appropriate mitigation will be provided, if required. This could lead to a deterioration in WFD status. This would be contrary to paragraphs 5.225 to 5.227 of the NPSNN.*

Highways England Comment

20.3.1 Paragraph 5.225 of the NN NPS states that *“The Secretary of State will generally need to give impacts on the water environment more weight where a project would have adverse effects on the achievement of the environmental objectives established under the Water Framework Directive”*. The WFD

Compliance Assessment (Application Document Reference 7.6) concludes that the achievement of the environmental objectives established under the Water Framework Directive should not be adversely affected due to the Scheme.

20.3.2 Paragraph 5.226 of the NN NPS states that *“the overall aim of projects should be no deterioration of ecological status in watercourses, ensuring that Article 4.7 of the Water Framework Directive Regulations does not need to be applied”*. Paragraph 5.227 of the NN NPS states that *“The Examining Authority and the Secretary of State should consider proposals put forward by the applicant to mitigate adverse effects on the water environment”*. Mitigation measures where necessary are referenced in Table 7.1 of the WFD Compliance Assessment and/or within the Outline CEMP (Appendix 4.2A of the ES) (Application Document Reference 6.3). On completion of the Scheme, as outlined in paragraph 9.1.3 of the WFD Compliance Assessment, Scheme mitigation proposals, when in place, will ensure no deterioration in water quality or the ecological status of watercourses.

20.3.3 The reasons for scoping out certain water bodies from the Stage 4 assessment are summarised in the response at paragraph 20.2.1 and given this reasoning, Highways England considers that the WFD Compliance Assessment is sufficient and has sufficiently assessed the waterbodies and protected areas potentially affected by the Scheme. No deterioration in WFD status will result from the Scheme.

20.4 3.1.4 - *We anticipate that upon receipt of the further information required, so long as it shows that water quality status will not be reduced, we will be able to agree adequacy of the WFDCA and if required, satisfactory mitigation. If any mitigation is required we expect that this could be secured through the DCO or other appropriate consents. If agreement is reached through the course of the examination, we will jointly provide a copy of our agreed position to the ExA once finalised.*

Highways England Comment

20.4.1 Highways England acknowledges the above statement and welcomes Environment Agency’s confirmation that the Environment Agency anticipates being able to agree the adequacy of the WFD Compliance Assessment. However, as stated above Highways England considers the WFD Compliance Assessment

to be sufficient so is of the view that no additional information needs to be provided on this issue.

20.4.2 Mitigation measures, such as minimising sediment re-suspension during the works, implementing the Environment Agency's best practise pollution prevention guidelines and implementing spillage control devices during the works, are outlined in Table 7.1 of the WFD Compliance Assessment (Application Document Reference 7.6). These measures are included in the Outline CEMP and will be secured through Requirement 8, Schedule 2 of the Draft DCO (Application Document Reference 3.1).

21. 3.2 - RR ISSUE 3.2 - WFDCA TABLE 5.1 - USE OF UP-TO-DATE DATA

21.1 3.2.1 - Our RR state:

"Table 5.1 of the WFD Compliance Assessment shows the WFD 2009 legal baseline data as "Current" ecological status. We are now within cycle 2 of River Basin Management Planning and will be publishing the second RBMP at the end of this year (using the legal 2015 baseline). The WFD Compliance Assessment should account both for the legal baseline and for the current status (2014 data is available using the Catchment Data Explorer online). This includes using the cycle 2 water body boundaries instead of the cycle 1 boundaries.

Omission of cycle 2 water bodies will mean that the incorrect water bodies are assessed in the Compliance Assessment and therefore the risks are not fully assessed. A number of biological elements have deteriorated since the 2009 baseline data, again this means that the risks cannot be fully assessed. If the risks are not appropriately assessed then mitigation cannot be provided to prevent deterioration.

EA proposed solution 3.2: The WFD Compliance Assessment should be updated with the most up to date baseline data this will help to inform whether watercourses need to be scoped into or out of the assessment. It will also help to inform the appropriate level and location of any ecological compensation that will be required to prevent deterioration. The conclusions within the ES should be revised accordingly, to enable the decision maker to assess the application fully, with the support and advice of the Environment Agency."

21.2 3.2.1 - *Following our meeting with HE on the 25 September 2015, using the 2014 data available HE have undertaken a comparative review of the 2009 and 2014 data for the 19 surface waterbodies assessed within the WFDCA. In some instances the baseline data has*

changed. However, HE have ascertained that the conclusions of the WFDCA remain the same when taking into account the mitigation measures outlined in the 2009 Thames River Basin Management Plan.

- 21.3 3.2.2 - *Providing the new information is submitted as part of the application, we are satisfied that issue 3.2 has been addressed. Until further clarification and evidence is provided relating to other associated water quality issues detailed below we cannot agree the conclusions of the WFDCA at this time. If agreement is reached through the course of the examination, we will jointly provide a copy of our agreed position to the ExA once finalised.*

Highways England Comment

21.3.1 Highways England acknowledges the above statement and confirms that the evidence of the comparative review of the 2009 and 2014 baseline data for the 19 surface water bodies has been provided at Appendix C of this response.

21.3.2 Highways England's comments in relation to the Environment Agency's other concerns regarding water quality issues are provided below.

22. **3.3 - RR ISSUE 3.3 - WFDCA – WILL THE SCHEME INHIBIT THE IMPLEMENTATION MEASURES BEING UNDERTAKEN/RECOMMEND BY THE EA TO ADDRESS ECOLOGICAL FAILURES.**

- 22.1 3.3.1 - *Our RR state:*

"The WFD Compliance Assessment does not include an assessment as to whether the proposed works will inhibit the implementation of measures being undertaken/recommended by the EA to address ecological failures.

If the proposed works do inhibit the implementation of measures to address ecological failures, then there is the potential that improvements on WFD may not be achieved.

EA proposed solution 3.3: An assessment should be included in the WFD Compliance Assessment as to whether the proposed works would inhibit the implementation of measures to address ecological failures. If they are likely to do so then mitigation/compensation will be required to address this."

- 22.2 3.3.2 - *Chapter 7.2 of the WFDCA (APP-134) is titled WFD mitigation assessment. It concludes within paragraph 7.2.4 that providing the scheme specific mitigation measures are*

in place during and post construction, the scheme is not expected to prejudice the implementation of further mitigation measures identified in the Thames River Basin Management Plan. Table 7.1 of the same document provides a very generic indication to what these scheme specific mitigation measures may be but does not clarify how these will be agreed/secured and implemented or if more enhanced compensation mitigation measures will be required.

Highways England Comment

- 22.2.1 Mitigation measures in relation to the proposed works as outlined in the Stage 4 assessment are secured by the Outline CEMP (Appendix 4.2A to the ES (Application Document Reference 6.3)). Section 14.2.2 of the Outline CEMP outlines the measures that will be implemented by the contractor, to be detailed in the final CEMP, which will be in place when the contractor works within or close to WFD water bodies. Relevant Pollution Prevention Guidelines will be complied with as outlined in 14.3.1 e) of the Outline CEMP and the Environment Agency will be consulted by the contractor regarding measures to be implemented to contain and manage surface water runoff from the construction of the Scheme (section 14.3.1 of the Outline CEMP). This is a live document which will be updated as the design progresses. The suitability of the CEMP for securing the mitigation measures in this instance is referred to in Table 6.1 and 7.1 of the WFD Compliance Assessment when detailing appropriate mitigation which will be in place as a result of the in channel works. These mitigation measures will be further developed within the CEMP as the detailed design progresses.
- 22.2.2 With regards to the specific Environment Agency schemes mentioned above to address ecological failures, as stated within Table 1 above, Highways England will continue to engage in discussions with the Environment Agency to establish the details of their schemes and to seek to prevent any potential ecological failures as a result of the combined schemes.
- 22.3 3.3.3 - *Furthermore, some of the details of the proposed works are incorrect and this may impact the conclusions of the assessment report. For instance paragraph 7.2.3 refers to Chalvey Ditch culvert being lengthened by 1.5 metres at each end when other application documents including 7.6.34 to 7.6.35 of the Engineering and design report (APP-096) state that this culvert will be lengthening a total of 8 metres - 4 metres on either side.*

Highways England Comment

22.3.1 Highways England confirms that Chalvey Culvert, shown as work number 15 on sheet 21 of the Works Plans (Application Document Reference 2.3) is a 3.66m span box culvert that will be subject to culvert bore extensions of 2.91m to the north and 3.43m to the south, rather than the 1.5m extension referenced in paragraph 7.2.3 of the WFD Compliance Assessment (Application Document Reference 7.6). The impact of this on the conclusions of the WFD Compliance Assessment are discussed below.

22.3.2 As a result of the more extensive culvert lengthening, 'channel alteration' will be greater and the WFD mitigation measure for this water body (as set out in the Thames River Basin Management Plan) of adopting 'appropriate channel maintenance strategies and techniques to minimise disturbance to channel bed and margins' will be marginally further conflicted at the location of the proposed works than that reported in Section 7.2.3 of the WFD Compliance Assessment. However, the length of channel alteration in relation to the length of the existing culvert represents a proportionally small increase and the conclusions of the WFD Compliance Assessment are considered to remain valid, in that the Scheme works at this location are not expected to prejudice the implementation of further WFD mitigation measures.

22.4 *3.3.4 - The principles of this issue have been discussed with HE. However, further clarification and a mechanism to ensure delivery of the required mitigation and/or compensation measures have yet to be finalised. Proceeding with the proposed development without ensuring that the WFDCA is appropriate and that satisfactory measures will be in place could lead to a deterioration in WFD status. This would be contrary to paragraphs 5.225 to 5.227 of the NPSNN.*

Highways England Comment

22.4.1 Delivery of the final mitigation measures will be implemented through the CEMP, specifically within Section 14 (Appendix 4.2A to the ES (Application Document Reference 6.3)). Section 14.2.2 of the Outline CEMP (Appendix 4.2A to the ES (Application Document Reference 6.3)), outlines the measures that will be implemented by the contractor, to be detailed in the final CEMP, which will be in place when the contractor works within or close to WFD water bodies.

Relevant Pollution Prevention Guidelines will be complied with as outlined in 14.3.1 e) of the Outline CEMP and the Environment Agency will be consulted by the contractor regarding measures to be implemented to contain and manage surface water runoff from the construction of the Scheme (section 14.3.1 of the Outline CEMP). The CEMP is secured under Requirement 8, Schedule 2 of the Draft DCO (Application Document Reference 3.1).

3.4 - RR Issue 3.4 - WFDCA - Chalvey Ditch water bodies

22.5 *3.4.1 Our RR state:*

"There are two WFD Chalvey Ditch water bodies:

- GB106039023550 - Chalvey Ditches at Slough*
- GB106039023470 - Chalvey Ditches (lower reaches to River Thames confluence)*

GB106039023470 is the one scoped in for further assessment but it is GB106039023550 that actually flows under the M4.

Potentially the wrong watercourse is scoped in for further assessment. If the wrong watercourse and associated data is used then we cannot be certain that the conclusions of the WFD Assessment or any further assessment will be accurate. This could potentially lead to an impact on WFD status.

EA proposed solution 3.4: Confirmation is required as to whether GB106039023470 is the correct water body to scope in and if not, then the data for GB106039023550 needs to be included instead."

22.6 *3.4.2 - We have sought clarification from HE on this matter on several occasions including at our meeting on 25 September 2015 and most recently in email correspondence on 2 October 2015. We still await confirmation on this issue.*

Highways England Comment

22.6.1 Highways England confirms that GB106039023470 is the water body scoped in for further assessment rather than GB106039023550 that actually flows under the M4. A comparison of the two water bodies has been made, with details provided in Appendix B. As a result of this comparison, Highways England is of the opinion that the difference between the WFD attributes of

the two water bodies are minor - the overall status of the two water bodies is the same at present with the same overall status objective of good by 2027. In addition there are no additional mitigation measures as outlined in the Thames RBMP, which are assigned to the correct GB106039023550 water body which were not in place for the incorrect water body GB106039023470. Instead, two of the three potential conflicts between the Scheme and maintenance or implementation of the RBMP mitigation measures as outlined in the WFD Compliance Assessment for Chalvey Ditch can be removed as they are not in place for the correct water body reference. These two potential conflicts were:

- 1) Removal of hard bank reinforcement/revetment, or replacement with soft engineering solution; and
- 2) Retain aquatic and riparian habitats (channel alteration).

22.6.2 Based on this comparison as appended, the conclusions of the assessment with regard to the Chalvey Ditch remain applicable. Accordingly, there was no need to carry out further assessment in relation to GB106039023550.

23. RR ISSUES 3.5 AND 3.9 - ECOLOGY AND NATURE CONSERVATION

23.1 3.5.1 - Our RR state:

"We do not agree that the effects on habitats and plants is neutral, given that there will be loss of river habitats (channel bed, margins and banks) as a result of bridge widening and culvert lengthening.

If appropriate mitigation is not provided then there will be a loss in habitat and its connectivity. This could directly impact on whether the watercourses affected will be able to meet "good ecological status" or "good ecological potential" as required by the WFD.

EA proposed solution 3.5: In accordance with paragraph 5.25 of the NPS "Where significant harm cannot be avoided or mitigated, as a last resort, appropriate compensation measures should be sought". Therefore, such losses will need to be compensated for. Further information is required on the compensation proposed to ensure that it mitigates for any impact on the water environment"

[Furthermore] Table 9.5: Ecology and nature conservation impact summary. The permanent loss of river habitats through the enlarging of bridges and culverts has not been addressed in this table. Environment Agency consent will be required for these works and according to our culvert policy, where we do allow culverting, we require adequate mitigation. This often involves the opening up of an equal amount of culvert elsewhere. The table does not adequately assess the impact of the proposal on ecology if the permanent loss of river habitats is not included.

EA proposed solution 3.9: Table 9.5 should be updated to include the permanent loss of river habitats. The conclusions within the ES should be revised accordingly, to enable the decision maker to assess the application fully, with the support and advice of the Environment Agency."

23.2 3.5.2 - *In correspondence with us, HE have noted that "the loss of river habitats (channel bed, margins and banks) is very small and results in a negligible magnitude of impact." However, there will be a loss.*

23.3 3.5.3 - *Updates to the ecology and nature conservation assessment and further information on the proposed compensation measures are sought from HE to ensure that any impact on the water environment is appropriately addressed. Furthermore, clarification is sought on how these measures will be secured - through the DCO, other consenting regimes, etc...?*

Highways England Comment

23.3.1 Small areas of watercourse habitats will be lost due to works at the Chalvey Culvert; Ashley's Arch Culvert and Thames Bray Bridge. The impact of the loss of in-channel habitats has been assessed as not significant. This conclusion is largely based on the small area of channel affected, as outlined below (and see Appendix 9.4 of the ES (Application Document Reference 6.3)). Therefore, Highways England does not consider that the loss needs to be compensated for and does not consider that any mitigation is required

23.3.2 Chalvey Culvert and Ashley's Arch Culvert extensions:
Receptor value: The watercourses within the Order limits at Chalvey Culvert and Ashley's Arch Culvert have been valued at the 'local' (defined as: 'Areas of habitat; or populations/communities of species considered to appreciably enrich the habitat resource within the local context (such as veteran trees), including

features of value for migration, dispersal or genetic exchange'; Interim Advice Note ("IAN") 130/10) or 'low' level.

- 23.3.3 Impact magnitude: The loss of an entire section of watercourse channel is considered to be a 'minor' impact (defined as: 'Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements (Adverse)'; Design Manual for Roads and Bridges ("DMRB") Volume 11, Section 2, Part 5 (HA 205/08)). The extent of watercourse channel habitats that will be lost at Chalvey is approximately 22m² and at Ashley Arch is approximately 4.5m². In both cases, the entire channel width will be affected.
- 23.3.4 Significance of Effect: Through the use of the matrix in Table 9.4.2 in Appendix 9.4 of the ES (Application Document Reference 6.3), the impact is considered to be 'neutral' (defined as: 'No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error'; DMRB Volume 11, Section 2, Part 5 (HA 205/08)).
- 23.3.5 Thames Bray Bridge works:
Receptor value: The Thames within the Order limits at Thames Bray has been valued at the 'county' level (defined as: 'Areas which meet the published selection criteria for ... [designated] sites ... but which are not themselves designated as such. [Or] Areas of key/priority habitats identified in the Local BAP; and areas of habitat identified in the appropriate Natural Area Profile (or equivalent)'; IAN 130/10) or 'medium' level.
- 23.3.6 Impact magnitude: The loss of relatively small parts of the river channel is considered to be a 'negligible' impact (defined as: 'Very minor loss or detrimental alteration to one or more characteristics, features or elements (Adverse)'; DMRB Volume 11, Section 2, Part 5 (HA 205/08)). The extent of watercourse channel habitats that will be lost at Thames Bray is approximately 50m². This comprises two working areas, one 10m², and another 40m². These losses affect only part of the river channel (which is 45m wide at this location).
- 23.3.7 Significance of Effect: Through the use of the matrix in Table 9.4.2 in Appendix 9.4 of the ES (Application Document Reference 6.3), the impact is considered to be 'neutral' (defined as: 'No effects or those that are beneath levels of perception,

within normal bounds of variation or within the margin of forecasting error'; DMRB Volume 11, Section 2, Part 5 (HA 205/08)).

23.3.8 No direct replacement of in-channel habitats has been proposed because the amount of in-channel habitat to be lost to the Scheme is minimal. However, in compliance with national policy including the NN NPS, opportunities for ecological enhancement measures have been sought (including the provision of: wildflower seed mix for grassland reinstatement; native trees for tree planting; otter ledges at culverts or underbridges; 60 bat boxes; 40 bird boxes; and the removal of invasive species) to maximise the biodiversity benefits of the Scheme (see paragraph 9.4.117 of the ES (Application Document Reference 6.1)). These measures are outlined within the paragraphs 9.4.118 to 9.4.124 of the ES.

23.3.9 Within the Ecology and Nature Conservation Impact Summary Table (Table 9.5 of the ES; Application Document Reference 6.1), river habitats are included under the receptor heading 'Habitats and plants'. The effects of the Scheme on all habitats and plants, including river habitats, has been assessed as 'Neutral'.

24. 3.6 - RR ISSUE 3.6 - WATER VOLE HABITAT

24.1 3.6.1 - Our RR state:

"Water Vole habitat sections 9.4.79 -9.4.84. Confirmation is required as to whether there will be any permanent loss of water vole habitat, e.g. where bridges or culverts are to be enlarged.

If appropriate mitigation is not provided then there will be a loss in habitat and its connectivity.

EA proposed solution 3.6: Such losses will need to be compensated for. Further information is required on compensation proposed to ensure that it mitigates for any impact on the water environment. Compensation proposed should in accordance with the NPPF and the NPS look to enhance the natural environment."

24.2 3.6.2 - We still await confirmation on this matter from HE. If there is any permanent loss of water vole habitat then this should be compensated for within the scheme. If appropriate off-setting and/or other measures are not proposed and implemented this could result in a net loss of natural habitat. Paragraph 5.25 of the NPSNN states that "development should avoid significant harm to biodiversity and geological conservation interests, including through

mitigation and consideration of reasonable alternatives. The applicant may also wish to make use of biodiversity off-setting in devising compensation proposals to counteract any impacts on biodiversity which cannot be avoided or mitigated."

- 24.3 3.6.3 - *Depending on which confirmation is provided may depend on the likelihood of this issue being resolved. If there is no result of permanent loss or if satisfactory compensation is proposed and appropriately secured within either requirements or other consent regimes then it is likely that we will be able to reach agreement on this issue. We will notify the ExA of any resolution to this issue.*

Highways England Comment

- 24.3.1 Water voles are present in the vicinity of the Scheme, as noted in paragraph 9.4.79 of the ES (Application Document Reference 6.1). Surveys in the vicinity of the Scheme confirmed the presence of water voles on three watercourses between junctions 12 and 11, but habitats considered suitable for water voles were also identified elsewhere throughout the Scheme (listed in detail in Appendix 9.1 of the ES, Annex 6A (Application Document Reference 6.3)).
- 24.3.2 The Scheme will not affect water voles in their current distribution (the baseline). As stated in paragraph 9.4.81 of the ES, no works to occupied water vole habitats (or within 5m of watercourses occupied by water voles) are proposed and, therefore, neither a licence under the Wildlife and Countryside Act 1981 (as amended) nor any targeted mitigation required. Highways England notes that Natural England, in their Written Representation, stated: "*we therefore have no outstanding issues or concerns with regard to this Project*". Highways England and Natural England have agreed a Statement of Common Ground.
- 24.3.3 However, to ensure that the baseline remains valid, as stated in paragraph 9.2.16 of the ES (Application Document Reference 6.1), pre-construction surveys will be undertaken in works areas where vegetation is to be removed or ground-breaking works are to occur, particularly in areas which include potentially suitable resting or breeding habitat for mobile protected species, such as water vole burrows. Pre-construction surveys are secured under Requirement 13, Schedule 2 of the Draft DCO (Application Document Reference 3.1).

25. 3.7 - RR ISSUES 3.7 AND 3.8 - OTTERS

25.1 *Our RR state:*

"No evidence of otters were found between junctions 7 and 3. Therefore otters have not been considered further between these links, even though there is potential otter habitat present. The application documents state that preconstruction surveys will be carried out but otter signs can be missed and otters do not always spraint (the most conclusive field sign) in their territories. Given the mobile nature of otters and their large territories, a precautionary approach should be taken, by implementing mitigation measures during construction at all watercourse crossings.

If no mitigation is provided and otters should be present during construction, this could lead to the disturbance, injury or death of otters. Therefore, we strongly recommend that appropriate mitigation measures are in place for otters during construction at all watercourse crossings (including ditches)."

25.2 3.7.2 - *We welcome the proposed use of otter fencing as noted in section 9.4.113. However, we believe it should not just be restricted to areas where evidence of otters has been recorded. It should be extended to include all areas where otters could potentially cross as otters are very mobile, cover large areas and may increase in numbers and range in the future. In addition, mammal tunnels or ledges should be included in all suitable bridge crossings where otters are likely to try to cross via the road in times of high flows. These measures would be some of the enhancements that the scheme could deliver as supported by NPSNN paragraphs 5.23, 5.33 and 5.36.*

25.3 3.7.3 - *Failing to implement appropriate measures such as fencing may result in otters trying to access the road from a watercourse where otter fencing has not been installed. Consequently they could be injured or killed and/or pose a health and safety risk to road users.*

25.4 3.7.4 - *We anticipate that the proposed use and location of otter fencing could be secured by an appropriately worded requirement if consent is granted. We will continue to liaise with HE and the ExA on these matters.*

Highways England Comment

25.4.1 Highways England believes that the proposal for the installation of otter-resistant fencing (presented on the Environmental Masterplan (Annex A1 of the

Engineering and Design Report) (Application Document Reference 7.4)) is appropriate. Otter fencing has been proposed in key locations where otters may attempt to cross the Scheme. The number of safe crossing points will not decrease as a result of the Scheme, but if otters attempt to cross the carriageway (see paragraph 9.4.110 of the ES (Application Document Reference 6.1)), the presence of the proposed concrete barrier is likely to reduce the chances them doing so successfully

- 25.4.2 As noted in paragraph 9.4.113 of the ES (Application Document Reference 6.2), otter fencing will be focused around bridges over watercourses where evidence of otters has been recorded. However, it is not Highways England's intention to restrict otter fencing only to these locations. Indeed, Highways England has assumed that any other watercourses which pass beneath or adjacent to the Scheme may be used by otters from time to time (paragraph 9.4.111 of the ES). Otter fencing is proposed at other watercourse crossings, for example at chainage 16000, east of junction 4. Opportunities to increase provision of otter fencing – for example associated with the provision of otter ledges within culverts (see below) – will be considered at the detailed design stage.
- 25.4.3 As stated within paragraph 9.4.121 of the ES (Application Document Reference 6.1), the Environmental Masterplan will incorporate the installation of otter ledges on culverts or under bridges where no ledge is currently present, in accordance with DMRB Volume 10, Section 4, Part 4. This will ensure improved habitat connectivity for otters (and water vole) beneath the Scheme and allow for adaptation to climate change. However, the large number of watercourses crossed by the Scheme would preclude the provision of an otter ledge at each one (as is suggested by the Environment Agency in their written representation). Instead, otter ledges will be installed at Chalvey Culvert and Ashley's Arch Culverts, which are to be lengthened as part of the Scheme, and at a small number of other culverts which are to be identified at the detailed design stage.
- 25.4.4 The otter fencing proposed is to be secured pursuant to a scheme to be approved in consultation with the Environment Agency, as provided for in a new requirement at Schedule 2 of the DCO, which is included in the revised DCO submitted at Deadline III.

26. **3.8 - THIS ISSUE IS ADDRESSED WITHIN SECTION 3.7 ABOVE.**

27. **3.9 - THIS ISSUE IS ADDRESSED WITHIN SECTION 3.7 ABOVE.**

28. **3.10 - WATER RECOURSES - DEWATERING OF EXCAVATIONS**

28.1 3.10.1 - *Our RR state:*

"Dewatering of excavations has the potential to damage the receiving watercourses. We strongly recommend that HE implement suitable pollution prevention controls where dewatering activities occur, for example, settlement ponds, sediment traps and visual checks. We acknowledge that some of these measures are noted within the outline CEMP however, the mechanism for securing/implementing this document is not clear within the draft DCO."

28.2 3.10.2 - *Dewatering activities are required to comply with the Environment Agency's Regulatory Position Statement (RPS): Temporary water discharges from excavations <https://www.gov.uk/government/publications/temporary-water-discharges-fromexcavations>*

28.3 3.10.3 - *Where dewatering activities do not fall within the criteria of the RPS then the discharge will require an environmental permit for a bespoke water discharge activity. Dewatering activity is currently exempt from regulatory requirements."*

28.4 3.10.4 - *ES Sub-section 15.4.42 - The need for an abstraction licence, if water abstraction is required, has been recognised. The applicant must be aware that any abstraction licence granted will be done so in such a way so as to avoid derogation of existing abstractors. Any licence granted may be subject to constraints limiting/preventing abstraction under low-flow conditions. It is important that they contact the Environment Agency at an early stage due to the regulatory procedures that might apply (time constraint imposed by these procedures) where a licensing situation arises.*

Highways England Comment

28.4.1 Highways England acknowledges the concerns of the Environment Agency with regards to de-watering activities.

28.4.2 Highways England confirms that suitable pollution prevention controls will be implemented where dewatering activities are required, as secured by paragraph 13.2.6 of the outline CEMP.

- 28.4.3 A number of old landfill sites that have initially been identified along the Scheme. Where these are likely to be impacted by the works then ground investigation including contamination testing has been planned. This will assist in identifying if contaminated groundwater is likely to be present and if so allow the appropriate protocols to be put in place to deal with it at an early stage and ahead of the construction works.
- 28.4.4 Additional protection is provided in the event of the discovery of any previously unidentified contaminated land and groundwater under Requirement 12, Schedule 2 of the Draft DCO (Application Document Reference 3.1). This requirement allows for the work to cease and the matter to be reported immediately to the Environment Agency and the relevant planning authority.
- 28.4.5 As stated in paragraph 29.3.2 below, the requirement for de-watering activities will be finalised during the detailed construction planning stage, whereupon early engagement with the Environment Agency will be held, which will identify any licences required; as secured by as secured by paragraph 13.2.5 of the outline CEMP.

29. 3.11 - ABSTRACTION LICENCES

- 29.1 *3.11.1 - The scheme, primarily in the design/construction stage, may impact upon water abstraction operations and infrastructure relating to public water supply. The applicant must determine what, if any, abstractions the scheme will conflict with, and liaise with the custodians of said abstractions to establish how to best mitigate against any negative impacts. Of particular concern are the abstractions at Beenham's Heath and Bray, which sit within 100m of the centreline of the scheme. The public water supply abstractions deemed to be at risk, the precise impacts and the mitigation measures must be assessed, agreed with the abstractor(s) and documented.*
- 29.2 *3.11.2 - ES Sub-section 15.4.46 - Actions are highlighted which will be undertaken if there is any requirement to dewater the groundwater. The potential concern for dewatering relates to the abstraction of any contaminated/polluted water. These poor quality waters (where identified) may be due to more than just a heavy silt content. This needs to be carefully monitored and assessed as the discharge of such water into controlled water could result in an pollution incident. Information from any water quality sample, and land survey data*

needs to be assessed to flag potential issues, and adequate measures incorporated into the method statement for this activity.

- 29.3 3.11.3 - *We would request that proposed areas for dewatering be discussed through the detailed design phase.*

Highways England Comment

29.3.1 Highways England acknowledges the concerns of the Environment Agency with regards to de-watering activities.

29.3.2 De-watering activities will be identified during the detailed construction planning stage and early engagement with the Environmental Agency will be held to discuss proposed solutions and to ensure solutions and controls are compliant with the current Regulatory Position Statement (“RPS”) for temporary de-watering. During that engagement, potential licence requirements will be identified and applied for early in advance of the construction works; as secured by paragraph 13.2.5 of the outline CEMP.

29.3.3 A Hydrogeological Risk Assessment, looking at the potential impacts of the Scheme on groundwater protection zones and public water supplies, will be completed and provided to the Examining Authority by the end of the Examination. That Hydrogeological Risk Assessment will determine what, if any, abstractions the Scheme will conflict with. Highways England notes that it is already in discussion with South East Water in relation to its abstractions in the vicinity of the Scheme.

29.3.4 The Hydrogeological Risk Assessment will concentrate in particular on abstractions at Beenham’s Heath and Bray. This report will detail the likely impacts and, as appropriate, the necessary measures to mitigate against any impacts. This assessment is shortly to commence and is currently programmed to be completed by the end of Examination.

30. 4.0 - FURTHER INFORMATION

- 30.1 4.0.1 - *Sections 4.1 to 4.4 are comments previously included on our RR. We do not wish to add anything further to these remarks at this time. They have been included for reference.*

31. 4.1 - GROUNDWATER QUALITY AND CONTAMINATED LAND

31.1 4.1.1 - *The Environmental Statement appears to have addressed most of the issues with respect to protecting aquifers and source protection zones within Chapter 15. It also covers potential sources of contamination (eg. landfills) in chapter 10.*

31.2 4.1.2 - *In Chapter 10, within the list of receptors in many of the tables it has "Persons abstracting water without a licence". Under "locations" it puts "Unknown theoretical only". However, we are aware of a number of domestic and private abstractions below 20m³/day (these would not require a licence) within the zone of investigation along the motorway. We are not responsible for keeping a record of these abstractors but the Local Authority will have records of potable abstractions. We strongly recommend that HE obtain a record of these from the relevant Local Authorities.*

Highways England Comment

31.2.1 Highways England acknowledges the above statements confirms that a Hydrogeological Risk Assessment, looking at the potential impacts of the Scheme on groundwater protection zones, is to commence shortly. As part of this study records of unlicensed abstractors will be obtained from Local Authorities.

32. 4.2 - FLOOD DEFENCE CONSENT

32.1 4.2.1 - *Under the terms of the Water Resources Act 1991 and the Land Drainage Byelaws, the prior written consent of the Environment Agency is required for any proposed works or structures in, under, over or within 8 metres of the top of the bank of the River Thames, classified as "main river". "Flood Defence Consent" is separate to planning permission.*

Highways England Comment

32.1.1 Highways England is currently reviewing the terms of Article 16 in the Draft DCO, with regard to the flood defence consenting regime as set out under the Water Resources Act 1991 and land drainage byelaws, Highways England confirms that there have been discussions between Highways England and the Environment Agency on this point. At present, Highways England is not seeking to dis-apply the flood defence consenting regime, and confirms that all required consent applications will be lodged at the appropriate juncture. However, should Highways England seek to disapply the flood defence consenting regime, it will

consult with the Environment Agency to reach agreement regarding the inclusion of additional protective provisions within the DCO.

33. 4.3 - ENFORCEMENT OF ENVIRONMENTAL PROTECTION LEGISLATION

33.1 4.3.1 - *Legislative enforcement and investigatory powers by authorised Officers of the Environment Agency must be legally afforded to ensure powers of environmental protection remain enforceable within the entire footprint of the scheme regardless of land ownership rights, i.e. Crown exclusion. Access should be provided for our officers to investigate any environmental incidents or resulting effects that take place during construction and post completion.*

Highways England Comment

33.1.1 Highways England confirms that the works will comply with the legal requirements and access will be provided should Environment Agency officers be required to investigate any environmental incidents or resulting effects that take place during construction and post completion.

34. 4.4 - CONSTRUCTION

34.1 4.4.1 - *Construction site(s) must all times adhere to Environmental Legislation and Duty of Care. Construction contractors and Stakeholders involved in operational implementation are strongly advised to contact our Environment Agency Office to seek advice, guidance and legislative input to any site activities that may have an impact on the environment or have obligation to specific regulatory control, such as, but not limited to the Environmental Permitting Regulations, 2010.*

Highways England Comment

34.1.1 Highways England acknowledges this advice and we will continue to engage with Environment Agency as the Scheme progresses. Highways England's governance procedures take due cognisance of environmental legislation that is relevant to this type of project as set out in the Details of Other Consents and Licences document (Application Document Reference 5-5). Highways England is now a regulated company and the Duty of Care is a requirement of its licence granted by the Secretary of State.

35. 5.0 - DRAFT DCO, EXA 1ST WRITTEN QUESTIONS AND LAND INTERESTS

35.1 5.0.1 - Draft DCO - We have several issues and concerns regarding the draft DCO as submitted. However, we are seeking clarification from HE and have sent various comments and questions to them on this matter. We are currently awaiting responses to our queries prior to suggesting amendments to the DCO. We will endeavour to submit our suggestions as soon as possible upon receipt of the appropriate information.

Highways England Comment

35.1.1 Highways England's legal team has been in contact with the Environment Agency's lawyers to discuss the comments and questions raised by the Environment Agency in respect of the Draft DCO and in particular in relation to how the mitigation proposals will be secured and the Environment Agency's interests protected. Those discussions are on-going, with the most recent round of responses provided to the Environment Agency on 27 October 2015. Highways England will continue to engage in discussions with the Environment Agency in order to resolve the issues raised.

35.2 5.0.2 - ExA 1st written questions - We have responded to several of the ExA 1st round of written questions. Our comments have been submitted to the ExA as separate document.

35.3 5.0.3 - Land Interests - The Environment Agency have several land and/or asset interests on various ground associated with the proposed works. Our estates team are currently exploring what implications the proposed works may have on the Environment Agency's interests and how we may work together with HE to ensure all parties are accommodated. Amongst other things they are currently considering if there are any rights that belong to us that are being compulsorily acquired, are there any proposed street closures that may result in us not being able to access land/assets for maintenance purposes, etc... We will endeavour to keep the ExA informed of any issues or suggestions in the near future.

Highways England Comment

35.3.1 Highways England awaits the details of the analysis by the Environment Agency Estates Team.

