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Submitted via portal

APPLICATION BY NATIONAL HIGHWAYS FOR AN ORDER GRANTING DEVELOPMENT CONSENT FOR THE A12 CHELMSFORD TO A120 WIDENING

Please find below Deadline 6 comments from the Environment Agency in response to statements made within document **9.52 Applicant's Comments on Others' Responses to ExQ2 [REP5-003]**. The statements from the Applicant are in *italics*.

Q2.18.5

"The Environment Agency referred to the A47 scheme, another National Highways' scheme where they considered that culverts have been introduced successfully."

As highlighted in our Responses to ExQ2 [REP4-074], we were actually referring to the approved National Highways A47 North Tuddenham to Easton dualling scheme in Norfolk (TR010038), where a clear span bridge, not a culvert, with a minimum 5-metre riparian buffer each side is being provided to cross the River Tud.

"Additionally, the Applicant raised a query regarding the consistency of approach in relation to BNG (biodiversity net gain), in particular consideration of BNG on the Lower Thames Crossing scheme which in that case results in a negative River and Streams unit score and has been accepted by the Environment Agency."

The scale of the Lower Thames Crossing scheme has caused some difficulties in applying the BNG calculator, and this has been raised with Natural England. Discussions with the promotor of the Lower Thames Crossing scheme (National Highways) have satisfied the Environment Agency that although the BNG metric calculation has produced negative figures the actual environmental improvements are in reality greater than the loss. A scheme that truly has a negative impact would not be acceptable.

“In accordance with the mitigation hierarchy, the Applicant has also sought to avoid impacts by retaining existing vegetation (including riparian habitat) as far as reasonably practicable and will continue to do so as the detailed design develops. This is committed to in LV4 in the Register of Environmental Actions and Commitments (REAC) [REP4-023] and shown on the Retained and Removed Vegetation Plans [APP-035 and REP4-007]. Where it has not been possible to avoid loss of vegetation, mitigation measures have been proposed. The measures of most relevance to this response are provided below, with full details available in Section 9.10 of Environmental Statement Chapter 9: Biodiversity [APP-076].”

Riparian habitat and vegetation will be lost in sections where culverts and culvert extensions are imposed on watercourses. This detrimental long-term impact is avoidable if clear span bridges with bridge abutments set back from river bank edge are used instead. Aquatic wildlife relies on in-channel, marginal and riverbank vegetation for the basis of the ecosystem. Clear span bridges are seen as a better ecological choice of road crossing design which allow natural river systems to coexist with sustainable development. Culverts, particularly long dark ones such as these proposed here are generally devoid of plants and allow very little insect life to the detriment of a healthy ecosystem.

Fish and invertebrates rely on in-channel vegetation to hide, feed and, in many species, breed in. Juvenile fish and elvers rely on aquatic vegetation for refuge, food and to migrate through as they pass upstream in higher flows. Culverts do not permit these natural habitats to exist.

“While the Applicant acknowledges the potential adverse impacts associated with habitat loss and fragmentation (as stated in paragraph 9.9.5 of Chapter 9: Biodiversity [APP-076]) due to extending existing culverts and culverting of watercourses, the biodiversity assessment concludes that the implementation of standard and embedded mitigation measures would reduce these impacts to not environmentally significant (Section 9.11 of Chapter 9: Biodiversity [APP-076]).”

The proposed use of culverts can be seen to be introducing unnecessary adverse impacts. Our position remains that the proposed crossings will cause avoidable environmental damage. Widening the road crossings with clear span bridges would appear to be physically possible at each of the locations. The use of clear span bridges for the new crossings of the Domsey and Rivenhall Brooks would allow the natural vegetation and natural river bank habitat to remain. Even if (as has been suggested by the Applicant) bridge height may need to be compromised the extra width has the potential to deliver significant improvements to the crossings over the current proposals.

With natural bank and in channel vegetation fish passage would be easier, insects could continue to fly in lighter open sections and channel oxygenation would be healthy and more natural.

Mammal and other wildlife passage would be able to continue along the banks in the connected riparian zone. Fragmentation of the linear habitat would be completely avoided. The Lawton report (Making Space for Nature, 2010) principles (of bigger, better and more joined up ecological networks), which have informed the

government's 25 Year Environment Plan (2018) and subsequent Environmental Improvement Plan (2023) would be sensibly followed and the mitigation hierarchy would be seen to dictate the optimum design for people, landscape and wildlife.

As highlighted in our Deadline 5 response [REP5-031] at paragraph 1.6, we are working with partners to actively remove barriers to species movement, such as culverts, in Essex and across the country.

"Landscape planting has been designed to increase connectivity across the landscape and avoid fragmentation of habitats, as well as connecting to existing wildlife corridors (paragraph 9.10.14 of Chapter 9: Biodiversity [APP-076]). In addition, paragraphs 9.10.117 to 9.10.120 of Chapter 9: Biodiversity [APP-076] detail proposed enhancement measures for Boreham Brook, Domsey Brook and Rivenhall Brook and include the implementation of a 10m buffer zone (either through fencing, where practicable, or landscaping (leaving the area to rewild) to allow for a natural riparian zone and habitat creation. Buffer zones of this design can be as effective, if not more so, than planting and would result in an improvement on baseline conditions, where riparian vegetation is largely restricted by agriculture."

Whilst we support all these principles, the proposals risk damaging the connectivity of habitats permanently which is why we are seeking measures such as clear span bridges to protect connectivity and avoid fragmentation in the first place. New transport links should not be cutting off or compromising connectivity along river catchments by confining long sections into concrete box culverts.

"As stated in paragraph 9.10.74 of Chapter 9: Biodiversity [APP-076], where practicable fragmentation impacts across the wider proposed scheme for otter would be mitigated through the provision of mammal ledges and landscape planting would be designed to guide mammals to these features. The Applicant is producing a figure demonstrating how the proposals for each watercourse crossing would either not change or would provide an improvement with respect to permeability for otters. This figure will be submitted at Deadline 6."

We support the installation of mammal ledges through existing road crossings where there are no other alternative options. This is not the case here where the scheme proposes new crossings. Clear span bridges with natural in river or along river-bank options for mammals should be prioritised over culverts.

The proposals plan for retrospective mitigation for unnecessary ecological impacts resulting from the choice of river crossing design. Mammal ledges on well-designed new structures should not be necessary.

"With respect to freshwater fish (including macro-invertebrates and macrophytes), culverts have been designed in line with CIRIA culvert design best practice (Culvert, Screen and Outfall Manual, C786) to minimise the length of newly created culverts and to include natural substrate in culvert beds, thus ensuring no increase in flow velocity. Such mitigation measures are considered to negate any impacts of fragmentation and barriers to the free movement of fish as well as macro-invertebrates and macrophytes (paragraphs 9.11.361 and 9.11.368 of Chapter 9: Biodiversity [APP-076])."

CIRIA culvert design best practice is generally focussed on drains and very small watercourses rather than Main Rivers.

Invertebrates and fish rely on aquatic plants (macrophytes) which will not be present in long dark culverts. Many juvenile fish especially young eels rely on macrophytes to shelter in and weave between as they cannot tolerate fast flows in their upstream migration.

"As stated in paragraph 9.11.119 of Chapter 9: Biodiversity [APP-076], while there would be an overall loss of 230m of river through creation of the proposed new alignments, the realigned sections would improve the condition and therefore the river condition score (Appendix 9.14 Biodiversity Net Gain Report [APP-138]) of each of the rivers (those being Domsey Brook, Roman River and Rivenhall Brook) under the Water Framework Directive. Enhancement measures for Boreham Brook, Domsey Brook and Rivenhall are also proposed and are described earlier in this response."

This complete loss of habitat would be most effectively reduced by not introducing new long dark culverts. Enhancement of habitat elsewhere does not resolve the fundamental connectivity problems which the culverts will create.

"With reference to the Environment Agency's request for full exploration of alternative options, the Applicant refers to responses to ExQ2 2.18.5 and ExQ2 2.18.6 in the Deadline 4 Submission – Applicant's Responses to ExQ2 – Rev 2 [REP4-055]. The Applicant does not consider that there is a justification for a comparative exercise in either law or policy. As a matter of law, a decision maker can choose to have regard to a potential alternative to a scheme where the scheme is identified as having conspicuously harmful effects and where the scheme seeks to overcome such harm by reference to countervailing public interest benefits. Since the Applicant's assessment does not identify any "conspicuously harmful effects" arising from the proposed culverts, no duty arises as a matter of law for the Secretary of State to consider alternative proposals to them.

The only other means by which the Secretary of State could be required to consider alternatives would be if this was required by adopted policy. The Applicant is not aware of any such policy requirement in the NPSNN, the NPPF or the relevant adopted developments."

We have addressed these points in our Deadline 5 response [REP5-031] at paragraph 1.12.

"Eel passage - Enhancements of existing culverts on Roman River, Domsey Brook West, and Brain Bridge include the introduction of sediment substrate along the riverbed to act as natural flow regulation and provide overall channel heterogeneity. In addition, at each of the box culverts the invert would be buried beneath the natural bed of the watercourse to allow the continuation of sediment conveyance and reduce the impact on local flow dynamics (as committed to in RDWE 39 in the REAC [REP4-023]).

While the culverts would be longer, the low gradient would not adversely increase flow velocities above that already experienced through the existing structures (due to REAC commitment RDWE 39, see above). However, juvenile eels migrate along the bed and therefore the condition of the river substrate is of greater importance than flow velocity to early life stages. The proposed habitat improvements through the inclusion of bed material would improve conditions for migration."

Juvenile eels migrate upstream and benefit from vegetation. In places they rely on the roughness of the channel and on vegetation to alternately rest and propel themselves upstream. Adding bed material to a long culvert is an enhancement that will make a hostile environment slightly less bad, the underlying problem will not be resolved. More open clear span extensions to these existing crossings or replacement would solve this problem rather than extending the life of damaging structures.

"Mammal ledges are proposed on four crossings (Rivenhall Brook, Domsey Brook (west), Domsey Brook (east) and Roman River) and would be positioned at least 150mm above the 1% (1 in 100) Annual Exceedance Probability event peak water level with at least 600mm headroom. Ledges would also be at least 500mm wide with ramps to provide access from the bank. These specifications have been designed to ensure there are safe routes of passage, including during a flood event and are consistent with the dimensions presented in the Environment Agency's Policy Regarding Culverts (1999) (paragraph 4.3). As stated in the Applicant's response to REP2-053-004 in the Deadline 3 submission – 9.24 Applicant's Comments on Written Representations [REP3-009], a commitment (BI49) was added to the REAC submitted at Deadline 4 [REP4-023] to undertake post-construction monitoring of the structures with mammal ledges to determine whether the ledges are used by wildlife, including otters, for safe passage under the A12. Data collected would be used to inform the design of river crossings for future National Highways schemes.

Regarding the length of the culverts (particularly for Rivenhall Brook and Domsey Brook (east)), the Applicant acknowledges that empirical data to support or refute the idea culverts are an effective mitigation measure for mammal passage (notably otter and water vole) are not available. The Water Vole Mitigation Handbook suggests that culverts up to 35m are known to be effective. However, while this information is useful, it does not mean by omission that culverts of a different (longer) length are ineffective. A publication from The Otter Consultancy (Blackbridge: Otter Surveys and Mitigation Report, 2017) reports evidence of otters using a 116m long culvert without mammal ledges. This is significantly longer than the longest proposed culvert for the proposed scheme (Domsey Brook East, 60m), suggesting that the length of culverts being proposed would not pose a barrier to the movement of otter."

We have addressed these points in our Deadline 5 response [REP5-031] at paragraph 1.4 & 1.5. In our view the use of ledges does not mitigate the effects of the proposals on these main rivers. The alternative provision of clear span bridges would negate this extra risk to ecology and allow the river ecosystems to function without constraint.

We would welcome further monitoring and research on the use and effectiveness of mammal ledges, but this should be conducted on existing culverts elsewhere rather than introducing additional risks to the environment as part of this scheme.

"River Brain crossing - Potential enhancements to the existing River Brain crossing were discussed at the meeting of 5 May 2023. As part of the detailed design for the scheme the Applicant would investigate potential opportunities for improvements to this crossing, such as the creation of rock rolls. The Applicant welcomes ongoing engagement with the Environment Agency on this matter.

Ashman's Bridge - The Applicant acknowledges the Environment Agency's comments relating to Ashman's Bridge and will consider opportunities through the detailed design stage to retain natural banks where practicable, as well the application of innovative design measures where appropriate to maximise delivery for biodiversity."

We welcome the commitments to improve those crossings and look forward to reviewing the detailed design proposals from the Applicant.