

**HIGHWAYS ENGLAND DCO APPLICATION FOR JUNCTION 10 OF THE M25****RHS DEADLINE 8 COMMENTS ON  
HIGHWAY ENGLAND'S REP7-008  
(HE COMMENTS ON RHS DEADLINE 6 SUBMISSIONS)**

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## INTRODUCTION

1. This document responds to the Highways England REP7-008 document (HE comments on RHS Deadline 6 submissions).
2. RHS does not seek to reply to each point made by HE.
3. The usual caveat applies i.e. where RHS has chosen not to seek to reply to a point made by HE, this does not mean that RHS agrees with the point being made.
4. The headings used in this document follow those used by HE's REP7-008.

## HIGHWAYS AND TRAFFIC IMPACTS – SECTION 2.1 OF REP7-008

5. The first part of paragraph 2.1.1 of REP7-008 is irrelevant. The RHS Alternative Scheme does not retain a 'left-out' from Wisley Lane onto the A3 as a major/minor junction and this has never been suggested at any point within the RHS representations. It is clear from REP1-044 that the existing priority junction would be improved by way of a slip-road arrangement (REP1-044 paragraphs 5.6, 5.14 and 5.15).
6. Although on this occasion there is no reference to weaving standards not being met, the second part of paragraph 2.1.1 of REP7-008 suggests that as a grade-separated junction the left-slip cannot meet design standards owing to its proximity to the Wisley Lane northbound merge and the off-slip for Junction 10 and that it would therefore be inherently unsafe. The response provided by RHS in REP7-039 (Q3.13.7 and Q3.13.8) made clear that: the RHS Alternative Scheme would improve the existing weaving length from 865m to in excess of 1km; and that it has been designed on the basis of the design guidance in CD122 and responses to HE's comments on the Left Turn (against CD122) have also been responded to in REP7-039 (see plan at end of document). HE's presentation of accident data to attempt to support their safety comment has been demonstrated to be inaccurate and only two accidents of the claimed twenty within the last 5 years have been shown to have been specifically related to weaving movements from (the existing junction off) Wisley Lane (see REP5-053 item 4).
7. Discussions with HE in respect of the Wisley Lane slip component of the RHS Alternative Scheme are also ongoing as part of the Statement of Common Ground exchanges and further plans have been provided to assist these discussions. The drawings provided to HE demonstrate that a weaving length of 1km can be provided and that the only Departures from Standard for the Left Turn relate to the 'horizontal curvature' and 'near straight' elements.
8. The proposed arrangement under the RHS Alternative would not be inherently unsafe.

9. The claims made in paragraph 2.1.2 of REP7-008 have been disputed in previous representations by RHS, the latest being REP7-039 (Q3.13.7 and 8), REP7-040 (paragraphs 8 and 9).
10. The claims made on paragraph 2.1.3 of REP7-008 have been disputed previously for the reasons stated in REP5-053 (response to item 3).
11. It is noted that the claims made in paragraph 2.1.4 of REP7-008 are different to those originally stated in REP6-010 (paragraph 7.1.4), which suggested that the 30% switch from the Strategic Road Network (SRN) to the Local Road Network (LRN) was misleading and that the figure was 21%. HE now concedes that the switch is '*...approximately 20-30% of RHS traffic depending upon which survey information is used.*' For clarity, RHS has compared the AADT 2015 Base figure for traffic on the SRN (71.9%) with the 2037 DoSomething figure (42.5%). It should be remembered that all of the traffic figures quoted are based on HE's evidence REP7-040 (paragraph 7).
12. For the reasons set out above and contained within previous RHS representations, the suggestion by the Applicant that there is no basis for modelling the 'left out' as it would be too dangerous to consider is completely incorrect. HE has relied on a presumption that the 1km weaving length could not be met – this is incorrect.

## **RHS'S LETTER TO NATURAL ENGLAND (DATED 3RD APRIL 2020) AND FREETHS LLP ANNEX (INCLUDING BAKER CONSULTANTS APPENDIX)**

### **Summary**

13. RHS' REP6-024 included Freeths LLP's Annex "Natural England's incorrect statutory advice on HE's Statement to Inform a HRA of the DCO Scheme" and Baker Consultants' appendix "Review of impact on Nitrogen Deposition on Invertebrates". In REP6-024 RHS explained the numerous gaps ("lacunae"<sup>1</sup>) and inaccuracies in HE's Statement to Inform an Appropriate Assessment ("**SIAA**") (REP4-018) with regard to the assessment of the DCO Scheme's air quality impacts on the Ockham and Wisley Common component of the SPA.
14. RHS explained in REP6-024 why (i) NE's statutory advice to HE on HE's SIAA was wrong; and (ii) why HE's conclusions in its SIAA were wrong.

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<sup>1</sup> An appropriate assessment must not have lacunae and must contain complete, precise, and definitive findings and conclusions capable of removing all reasonable scientific doubt as to the effects of the proposals on the protected site(s) concerned. Paragraph 44 of the judgement in *Sweetman v An Bord Pleanála* (C-258/11)-

<http://curia.europa.eu/juris/document/document.jsf?text=&docid=136145&pageIndex=0&doclang=en&mode=lst&dir=&occ=first&part=1&cid=645773>

15. RHS is pleased to see from REP7-008 that HE has now agreed with RHS that, due to the importance of the woodland's invertebrates to the integrity of the SPA (the invertebrates being prey of the 3 qualifying SPA species), it is necessary for HE to provide an assessment of the DCO Scheme's air quality impacts on the invertebrates of the woodland of the Ockham and Wisley Common component of the SPA.
16. The RHS thanks HE for having now presented (in REP7-008) an assessment of the DCO Scheme's air quality impacts on the invertebrates of the woodland and the consequential impacts on the integrity of the SPA.
17. However, despite HE's further assessment, the conclusion reached by HE that (REP7-008 at 2.2.27) "*When considering all the evidence it is reasonable for the SiAA to come to the view that there will not be any adverse effects on the integrity of the SPA as a result of changes in nitrogen deposition rates attributed to the operation of the Scheme*" is **wrong**.
18. This document explains why.
19. The **correct** conclusion, based on the evidence presented by HE in REP7-008 and the earlier evidence, remains that:
  - 19.1. It cannot be concluded that the DCO Scheme (either alone or in combination with other plans or projects) will not have an adverse effect on the integrity on the SPA through air quality impacts on the woodland vegetation and thereby on qualifying bird species, either through impacts on the woodland invertebrate prey of the qualifying species and / or on their woodland habitat;
  - 19.2. As such the HRA "no alternative solution" derogation test must include consideration of any alternative which better respects the integrity of the SPA with regard to *air quality impacts* on the SPA as well as land-take impacts. This means that the RHS Alternative must be fully considered. The RHS Alternative incorporates additional components to the DCO Scheme which reduce the number of kilometres driven, compared to the DCO Scheme, by 2.6 million kilometres per year and therefore give rise to significantly smaller contributions of air pollutants than the DCO Scheme;
  - 19.3. If the correct analysis is applied by the Secretary of State it will be concluded that the RHS Alternative better respects the integrity of the SPA. This is because the RHS Alternative meets the need of the project, is better for the integrity of the SPA in terms of the air pollution impact pathway on the SPA and is equal in relation to the integrity of the SPA in terms of land-take from the SPA.
20. The RHS Alternative is therefore an "alternative solution" within the meaning of regulation 64 of the Conservation of Habitats and Species Regulations 2017.

21. Furthermore, as we explain below, HE's failure to provide adequate and robust air quality data, in particular in relation to the SPA woodland, means that the Secretary of State cannot have confidence, as is required under regulation 68 of the Conservation of Habitats and Species Regulations 2017, that HE's proposed compensatory measures will ensure that the overall coherence of Natura 2000 is protected.
22. Hence on the basis of the evidence before the ExA, the Secretary of State cannot lawfully confirm the DCO.
23. We note that HE in REP7-008 characterises Freeths LLP's Annex as having "misunderstood" or "mischaracterised" HE's earlier evidence (e.g. 2.2.3, 2.2.12 and A.1.3 of REP7-008). This is however of course itself a misrepresentation by HE. This is demonstrated clearly by the decision of HE to present in REP7-008 a further assessment (see above).
24. We note that HE repeatedly refers incorrectly (in REP7-008) to RHS' document REP6-025, when HE in fact means REP6-024.

### Detail

**Following its further assessment presented in REP7-008, HE now acknowledges that the DCO Scheme's "forecast changes in nitrogen deposition rates may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer" but nevertheless wrongly concludes that this will lead to no adverse effect on integrity of the SPA**

25. In HE's SIAA at paragraph 7.2.33 (REP4-018), HE acknowledged a pathway of impact on the integrity of the SPA between the air quality effects of the DCO Scheme and the invertebrate prey resource for the qualifying bird species in the woodland <150m from the road. HE states at 7.2.33: "*significant increases in nitrogen deposition resulting from the Scheme (during construction or operation) could lead to a reduction in the quality (structure and diversity) of habitats that support .... [i.e. the SPA qualifying species] invertebrate resource*". Note that NE and HE also acknowledged in their Statement of Common Ground ("**SoCG**", REP5-003) at 3.2.13 that the DCO Scheme *will* lead to "significant increases in nitrogen deposition" <150m from the road.
26. Despite this acknowledgment, HE at the same time presented in its SIAA no assessment of the DCO Scheme's air quality impacts on the woodland / heathland invertebrates and thereby on the SPA's qualifying species. This is a very significant omission, as explained in full in the Freeths LLP Annex of RHS' REP6-024.
27. RHS is pleased to see that, following RHS' REP6-024 (and in particular Freeths LLP's Annex), HE has now made an assessment (in REP7-008) of the DCO Scheme's air quality effects on the woodland of the SPA through this pathway.

28. However RHS notes that, unfortunately, the assessment presented and HE's conclusions from the assessment remain wholly deficient.
29. As a result of HE's further assessment, HE acknowledges (REP7-008) that:

*2.2.20 It is relatively straightforward to accept, on basic ecological principles, that a shift in vegetation composition as a result of nitrogen deposition will bring associated shifts in invertebrate biodiversity; many invertebrate species being more closely associated with particular plant communities.*

and

*2.2.12 the forecast changes in nitrogen deposition rates [from the DCO Scheme] may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer.*

30. However, HE then concludes that this acknowledged impact of air quality on woodland invertebrate composition would have no effect on the integrity of the SPA because only impacts on *overall invertebrate biomass* could affect the integrity of the SPA. HE states in REP7-008:

*2.2.12 Whilst the forecast changes in nitrogen deposition rates may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer, it will not have a material effect on the overall biomass (i.e. abundances) of invertebrates. This is important in the context that the SPA qualifying bird species are not reliant on a particular assemblage of invertebrates, but on their overall biomass. As stated previously, the SPA qualifying bird species do not forage within the buffer zones, but insofar as those buffer zones may contribute to the overall SPA invertebrate biomass, small changes in the invertebrate assemblage of buffer zones do not have an adverse effect on the integrity of the SPA.*

*2.2.20 As some vegetation becomes more dominant as a result of increased nitrogen deposition, certain invertebrates species will benefit, and whilst the composition may vary, the overall invertebrate biomass is likely to remain stable, therefore providing a continued invertebrate resource to the wider SPA.*

*2.2.26 Although the physical loss of woodland may result in a reduction in the invertebrate biomass, it can be concluded beyond reasonable scientific doubt that any changes in air quality within the woodland buffer as a result of the Scheme will not result in a perceptible reduction in the invertebrate biomass within the SPA for the SPA qualifying species.*

31. This approach is fundamentally wrong:

32. First the approach fails to take any account of the differing specific invertebrate prey items and size requirements of each of the 3 SPA qualifying species. Is it therefore wrong to conclude that only the overall biomass of invertebrates is of relevance to the integrity of the SPA's qualifying features. Instead both the composition of that biomass and the relative abundance of different specific prey items and sizes relied upon by each of the SPA interest features are crucial to the SPA's integrity.
33. The differing prey requirements of the SPA's 3 qualifying features are fully acknowledged in HE's own evidence in the SIAA (REP4-018):
  - 33.1. Dartford Warbler (SIAA 4.7.6, 4.7.8, 7.2.54): beetles, spiders, caterpillars and bugs
  - 33.2. Nightjar (SIAA 4.7.11, 4.7.12, 7.2.54): moths and beetles (flying insects)
  - 33.3. Woodlark (SIAA 4.7.15, 7.2.54): spiders, weevils and caterpillars
34. By way of example, if some species of moth in the woodland were negatively affected by air pollution from the DCO Scheme alone or in combination then plainly the population of Nightjar could be adversely affected. Similarly, if spiders were negatively affected by air pollution from the DCO Scheme alone or in combination then the population of Woodlark and Dartford Warbler could be affected. It is therefore obvious that the effects on the specific woodland invertebrate types and sizes from the DCO Scheme's nitrogen deposition must be considered so as to determine potential effects on the three qualifying species. As explained by Baker Consultants Ltd's Appendix in REP6-024, nitrogen deposition has complex impacts across the food web. There is evidence to show that increased nitrogen deposition is causing fundamental changes in moth populations (for example see <https://www.universiteitleiden.nl/en/news/2016/10/cml-nitrogen-deposition-elements-through-the-food-web>) with species that are adapted to low nitrogen levels in decline. Baker Consultants Ltd has provided further comments on the effects on invertebrates from nitrogen in the Appendix attached to this document.
35. This concern regarding nitrogen impacts on the woodland is supported by the conservation objectives of this SPA. They require, for *"the supporting habitat within and outside the SPA"*, the *"concentrations and deposition of air pollutants to be at or below the site-relevant Critical Load or Level values given for this this feature of the site on APIS"* (this is the objective for nightjar and there are very similar objectives for the other two species). HE has already confirmed in its SIAA (REP4-018) (e.g. 7.4.4 and 7.4.6) that the woodland <150m from the road *is* SPA supporting habitat.
36. Secondly this approach also fails to apply NE's conservation objectives which *expressly* acknowledge the importance of the 3 species' differing key invertebrate prey items and size requirements. The SIAA (REP4-018) contains at Appendix A (page 71-87) the "Thames Basin Heaths SPA conservation objectives: supplementary advice on conserving and restoring site features".

37. For Nightjar the advice reads:

- 37.1. Attributes: Supporting habitat (both within and outside the SPA): Food availability;
- 37.2. Targets: maintain or restore the distribution, abundance and availability of key prey items (e.g. moths, beetles) at prey sizes preferred by Nightjar;
- 37.3. Supporting and/ or explanatory notes: The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result, inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. The nightjar is insectivorous, feeding primarily on moths and beetles. Aspects which might affect prey availability will include lighting, pest control, changes in land use and habitat management.

38. For Woodlark the advice reads:

- 38.1. Attributes: Supporting habitat both within and outside the SPA) function/supporting process: Food availability;
- 38.2. Targets: maintain or restore the distribution, abundance and availability of key prey items (e.g. spiders, weevils, caterpillars) at prey sizes preferred by Woodlark;
- 38.3. Supporting and/ or explanatory notes: The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the woodlark population. Inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey in foraging areas may adversely affect the population.

39. For Dartford Warbler the advice reads:

- 39.1. Attributes: Supporting habitat (both within and outside the SPA): function/ supporting process: Food availability;
- 39.2. Targets: maintain or restore the distribution, abundance and availability of key prey items (e.g. beetles, spiders, caterpillars, bugs) at prey sizes preferred by Dartford Warbler;
- 39.3. Supporting and/ or explanatory notes: The availability of an abundant food supply is critically important for successful breeding, adult fitness and survival and the overall sustainability of the population. As a result,



inappropriate management and direct or indirect impacts which may affect the distribution, abundance and availability of prey may adversely affect the population. In general, structurally-diverse vegetation will provide larger availability of prey.

40. Plainly, therefore, NE's conservation objectives recognise that the three qualifying species of the SPA are each reliant on differing invertebrate types and they also recognise the importance of the preferred prey size of those different invertebrates. Hence HE is wrong to state (2.2.13 REP7-009) that:

*2.2.13 The Thames Basin Heaths SPA supplementary advice refers to the distribution, abundance and availability of invertebrate prey. Some key prey item groups (e.g. moths, beetles, spiders) are identified but there is no reference to a specific composition of woodland invertebrates being of particular significance. The overall advice supports a more logical interpretation that it is the biomass and distribution of key prey item groups which is of primary importance.*

41. HE has selectively quoted from NE's conservation objectives to arrive at this conclusion, omitting the following underlined words (e.g. in the case of Nightjar, but the others are similar): "maintain or restore the distribution, abundance and availability of key prey items (e.g. moths, beetles) at prey sizes preferred by Nightjar".
42. Hence, having acknowledged that "*forecast changes in nitrogen deposition rates [from the DCO Scheme] may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer*" in REP7-008, HE cannot (given the above) logically conclude that this risks no adverse effect on the integrity of the SPA simply because of an unsubstantiated view that the overall invertebrate biomass will not change.
43. As can be seen, HE has acknowledged that that "*forecast changes in nitrogen deposition rates [from the DCO Scheme] may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer*" but:
- 43.1. HE has *not provided sufficient information regarding the forecasted levels of the DCO Scheme's nitrogen deposition (alone or in combination with other plans or projects) in the woodland <150m from the road or in the heathland, see in detail at paragraphs 56-91 below;*
- 43.2. HE has not considered *how / in what way* the composition of invertebrates in the woodland or heathland might change as a result of those forecast changes in nitrogen deposition levels (this in turn depends on an assessment of how the vegetation might change in response to the forecast changes in nitrogen deposition);
- 43.3. HE has not considered how the acknowledged changes in invertebrate composition might relate to the differing prey item and size requirements of

each of the three qualifying species which (as seen above) are key to the SPA's conservation objectives;

- 43.4. HE has provided no explanation or justification as to how, based on the forecasted levels of nitrogen deposition in the woodland, it has concluded that the nitrogen deposition effect it now acknowledges on the invertebrate assemblage (i.e. composition) in the woodland would be "very small";
- 43.5. HE has provided no explanation or justification as to how, based on the forecasted levels of nitrogen deposition in the woodland or heathland, it has concluded that the effect on overall invertebrate biomass "*is likely to remain stable, therefore providing a continued invertebrate resource to the wider SPA*" (2.2.20); and that "*...the forecast changes in nitrogen deposition will not have a material effect on the overall biomass (i.e. abundances) of invertebrates*" (2.2.12) and that "*...any changes in air quality within the woodland buffer ... will not result in a perceptible reduction in the invertebrate biomass within the SPA for the SPA qualifying species*" (2.2.26). There is no evidence before the ExA as to how this conclusion been reached. To arrive at this conclusion there needs to be an analysis first of the way that nitrogen deposition is likely to affect the vegetation and then consider how invertebrates reliant on that vegetation could be affected.
- 43.6. HE has not then considered how invertebrate changes (whether in composition or in biomass) might thereby affect the three qualifying species of the SPA.
44. HE concludes the following but, as can be seen above, the conclusion is wholly unsubstantiated:
- 2.2.25 Therefore, it is clear that with the Scheme the retained established woodland will continue to provide the same woodland buffer function and invertebrate resource that it currently does and there will be no adverse effect on the integrity of the SPA as a result of air quality changes; of that there is no scientific doubt.*
45. HE has therefore not come anywhere *even close* to meeting the strict legal HRA tests set out at paragraphs 9 to 12 of Freeths LLP's Annex (REP6-024):
- 45.1. These require that the assessment is undertaken *in light of the best scientific evidence in the field*, that it contains *no lacunae and must contain complete precise and definitive findings removing all reasonable scientific doubt*; and
- 45.2. These also require the Secretary of State to be *certain* (though the HRA assessment process) that the DCO's air quality impacts on the woodland will have no adverse effect on the integrity of the SPA alone or in combination with any other plan or project, meaning that there must *be no reasonable scientific doubt as to the absence of any adverse effect*.

46. Baker Consultants Ltd has already provided evidence that nitrogen deposition can affect invertebrates:
- 46.1. HE seeks to rebut this at 2.2.18 and 2.2.19 of REP7-008 on the basis that one of the studies referred to by Baker Consultants (*Fox et al*) draws no conclusions about overall invertebrate biomass and distribution. This is true, since after all it was a paper on moths. But, as explained above, this is simply irrelevant because a narrow focus only on overall biomass is wrong. *Fox et al* makes clear that nitrogen deposition can affect negatively moth populations and such an affect could have a knock-on effect on Nightjar.
- 46.2. Further, in its rebuttal HE makes no mention of the potential for nitrogen deposition to affect the risk of heather beetle infestation as highlighted in paragraph 10 of Baker Consultants Appendix to REP6-024. Again, this must be addressed.
47. At paragraph 2.2.21 of REP7-008, it is stated that HE “*does not accept that minor shifts in invertebrate composition as a result of changes in nitrogen deposition could lead to an adverse effect on the qualifying bird species of the SPA*”. It may well be the case that HE does not accept this. But unfortunately for HE, what they accept or not, is irrelevant. The strict legal tests (as set out at paragraphs 9-12 of Freeths LLP’s Annex (REP6-024)) must be met.

**HE has no answer to the absence of sufficient Woodlark and Nightjar bird data from the SPA woodland <150m from the road**

48. NE and HE have consistently argued that birds of the SPA qualifying species do not nest or forage in, and are not present in, the woodland <150m from the road. See for example 2.2.12 of REP7-008.
49. Freeths LLP’s Annex (paragraphs 25 and 41-45) made the key point identified by Baker Consultants Ltd that HE collected *woodland* Nightjar and Woodlark data in only 1 year (2016) and that this was through visual surveys just before dawn and just after dusk, whereas Nightjars are known to be mainly active at night. Other bird surveys were indeed conducted in other years but they *did not include Woodlark or Nightjar surveys in the woodland*.
50. On that basis NE and HE simply cannot be certain of the level of Nightjar or Woodlark activity in the woodland areas of the SPA and whether or not they forage in the woodland. One year of survey effort is a wholly inadequate basis for the conclusion drawn by NE and HE that these species do not forage *in the woodland*.
51. HE seeks to address this point at 2.2.30 and 2.2.40 of REP7-008 but nowhere in these paragraphs does HE have an answer for this key point i.e. that the *woodland*

part of the SPA was inadequately surveyed meaning that HE and NE's conclusions regarding the qualifying species' foraging use of that *woodland* are unsafe.

52. At paragraph 2.2.37 HE states that they have relied on a PhD study (which used radio tracking of nightjar to record foraging) as proof that Nightjar avoid woodland for foraging. In fact, the PhD by K Sharps shows that Alexander and Cresswell IBIS Volume 132 Issue 4 1990 *Foraging by Nightjars Caprimulgus europaeus away from their nesting areas* (cited by Sharps in her PhD thesis) found in a similar study that Nightjar preferred broadleaved or mixed woodland for foraging. Evidently what may be true on one site is not necessarily true of all locations. HE has not carried out any radio tracking and therefore has no such data on the use of this SPA's woodland by foraging Nightjar.
53. At paragraphs 2.2.38 and 2.2.39 HE claim that bio acoustic surveys would not have assisted in determining whether the SPA birds were present or not in the woodland 'buffer'. While bio acoustic surveys cannot precisely pinpoint the location of birds within an area, it can be used to show the extent of the birds across an area. As explained above, HE has simply relied on visual surveys for species that are mainly active at night.
54. HE states at 2.2.40 that "*Highways England is confident that it has collected an extremely robust dataset and has an excellent understanding of the abundance, distribution and habitat utilisation of all three SPA qualifying species*". Robust data may well exist for the heathland >150m from the road, but it is not the case for the woodland <150m from the road; and it is the *woodland* which is the worst affected by the DCO Scheme's air quality impacts.
55. As such, RHS remains of the view that HE cannot conclude no adverse effect on the integrity of the SPA due to nitrogen deposition impacts on vegetation within the woodland <150m from the road.

**HE continues to fail to provide key nitrogen deposition data for the SPA which is crucially needed to assess the impacts on the nitrogen deposition on the SPA**

56. HE has acknowledged that "*the forecast changes in nitrogen deposition rates [from the DCO Scheme] may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer*".
57. But what are the forecast changes in nitrogen deposition rates to which HE is here referring? HE has not provided sufficient evidence on this issue.
58. In order to assess the impacts of nitrogen deposition on the SPA, it is essential for the Secretary of State to have robust air quality data for that area of the SPA. Yet HE has still not provided this.

59. There are still four key gaps in the data provided by HE to support the SIAA, as follows:
60. Firstly, HE has still not presented modelled nitrogen deposition increases from the DCO Scheme in combination with other plans or projects for all the receptors between the road and 200m away.
61. In-combination impacts are a critical element of an appropriate assessment, but HE's Table 4 in Appendix B of the NE / HE SoCG (REP5-003) merely provides in-combination predictions for the *heathland* part of the SPA 150m-200m from road, and provides nothing for the area <150m from the road, and nothing at all (for any distance) that includes the ammonia contribution (see below).
62. HE's Table 8 in REP5-024, starting on page 5, provides predictions for all distances from the road, but only for the DCO Scheme alone, not in combination with other plans or projects, and not with any contribution from ammonia (see below).
63. This amounts to a clear breach of the appropriate assessment requirement to assess the impacts on SPA integrity of the DCO Scheme in combination with other plans or projects. Having now conceded in REP7-008 that the Secretary of State must assess air quality impacts on the woodland invertebrates <150m from the road (this is conceded by HE having now presented a purported assessment to address this), HE cannot continue to maintain that the Secretary of State does not require full information about the in-combination levels of pollutants in the woodland and only requires such data for the heathland.
64. Secondly, HE has failed to provide data that includes the contribution of ammonia.
65. Ammonia from the traffic associated with the DCO Scheme both alone and in combination with other plans or projects must be included in the modelled predictions across all receptors of the SPA.
66. The RHS refers again to paragraphs 51 and 52 and 53 of Freeths LLPs Annex (REP6-024).
67. The RHS notes that HE criticises RHS (in 2.2.45 of REP7-008) for not providing references to recent HRAs that incorporate ammonia from road traffic in the assessment. The three examples given by RHS are well known, and HE could readily have found the relevant documents to allow it to "investigate the relevance of" these examples. For instance, for Ashdown Forest: <https://www.wealden.gov.uk/planning-and-building-control/planning-policy/planning-policy-evidence-base/habitat-regulations-assessment/> for Epping Forest: <https://www.efdclocalplan.org/wp-content/uploads/2019/01/EB209-Epping-Forest-Local-Plan-HRA-2019-FINAL.pdf> and for Havant: <https://www.havant.gov.uk/air-quality-habitat-regulations-assessment-pdf-59-mb>. Furthermore, the fact that HE did not include ammonia for

the A30 Chiverton to Carlond Cross project does not make it right for Highways England to repeat the same mistake again.

68. HE seeks to justify its decision not to present nitrogen deposition results taking account of ammonia by reference (see 2.2.43 REP7-008) to paragraph 5.8 of the NPS NN. This says "*Defra publishes future national projections of air quality based on evidence of future emissions, traffic and vehicle fleet. Projections are updated as the evidence base changes. Applicant's assessment should be consistent with this but may include more detailed modelling to demonstrate local impacts.*" HE claims in 2.2.43 that paragraph 5.8 is saying that the "*Emissions Factors Toolkit (EFT) should be used as the basis for assessment.*", but this is not what paragraph 5.8 in fact says. RHS recognises that the EFT does not include ammonia, and it is for this reason that Air Quality Consultants Ltd has recently provided the Calculator for Road Emissions of Ammonia (CREAM) (see REP5-049). Prior to this, the approach was to double the contribution due to nitrogen oxide emissions as an approximation for deriving the ammonia contribution to nitrogen deposition alongside a road.
69. HE further seeks to justify its decision not to present nitrogen deposition results taking account of ammonia by reference to the Institute of Air Quality Management (IAQM) guidance (REP7-008, 2.2.44). However, this guidance does not address the question of whether or not ammonia from road traffic should or should not be included in an assessment. The IAQM does say in paragraph 5.2.11 that "*The impacts from different pollutants also need to be considered, such as the impact on deposition of nitrogen derived from NO<sub>x</sub> and NH<sub>3</sub>. For example, the NH<sub>3</sub> contribution from agricultural activities may need to be considered together with NO<sub>x</sub> and NH<sub>3</sub> emissions from road transport*". The IAQM thus clearly recognises that both NO<sub>x</sub> and NH<sub>3</sub> emissions arise from road transport. It is therefore misleading for HE to say in 2.2.44 that the IAQM "*does not consider there to be a requirement for assessing the contribution of ammonia from road vehicles ...*".
70. HE has not even adopted the approach to ammonia which HE and NE have themselves stated to be "precautionary" (3.3.1 of the HE / NE SoCG REP5-003). This approach is to double the changes in nitrogen deposition rates derived from nitrogen oxides emissions, these being the only values presented by HE.
71. Rather than being "precautionary", as suggested by HE (REP4-005, page 18, paragraph 2), this doubling approach is in fact likely to underestimate the ammonia contribution (REP5-049) (see also REP6-024, pdf pages 23-25, paragraphs 48-55). As REP5-049 makes clear (e.g. see Figure 7, page 14 and Figure 19, page 29), such doubling is likely to give rise to an underestimate, especially in future years, and hence doubling the nitrogen deposition from nitrogen oxides emissions should not be regarded as precautionary.
72. To date, HE has failed to provide any results for nitrogen deposition using this "doubling" basis, despite RHS saying in REP6-024, para 54.7 "*This additional*

*information is required urgently from HE in order for complete assessment to be carried out in accordance with the legal requirements”.*

73. RHS has been able to deduce total nitrogen deposition incorporating ammonia (by the doubling approximation), but only for distances >150m from the road (see paragraph 54.7 and at Table 1 at paragraph 55 of Freeths LLP’s Annex (REP6-024)). RHS has not been able to do so for the area of the SPA from the road out to 150m, due to the absence of data provided by HE for receptor points 0m to 150m from the road.
74. Based on the RHS’s “deduced” Table 1, even at a 150m distance from the road, the increases in nitrogen deposition from the DCO Scheme in combination with other plans or projects are significant, reaching up to 6% of the critical load in one case. The increases will be even greater for those parts of the SPA closer to the road (within 150m).
75. RHS notes that at 2.2.48 HE states:

*2.2.48 RHS’ air quality consultants have amended Table 1 in the Natural England SoCG [REP5-003] to include ammonia, by doubling the road contribution to the total nitrogen deposition rate. However, as has already been established above, the supporting habitats for the qualifying features are present at locations of over 150 metres from the road. At this distance, the road contribution from ammonia emissions would not have a discernible effect, and hence there is no need to amend the table or to comment further.*

76. This is obviously wrong. HE has now accepted that an assessment of air quality impacts on the SPA’s woodland is required and has accordingly attempted / purported to undertake such an assessment (in REP7-008). HE has even acknowledged that:

*2.2.12 .....the forecast changes in nitrogen deposition rates may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer*

and has claimed that:

*The effect on overall invertebrate biomass “is likely to remain stable, therefore providing a continued invertebrate resource to the wider SPA” (2.2.20); and that “...the forecast changes in nitrogen deposition will not have a material effect on the overall biomass (i.e. abundances) of invertebrates” (2.2.12); and that “..any changes in air quality within the woodland buffer ...will not result in a perceptible reduction in the invertebrate biomass within the SPA for the SPA qualifying species” (2.2.26).*

77. These conclusions must now of course be informed by a transparent assessment of the woodland nitrogen deposition data on which they are based. It is simply nonsense

to continue to argue (as HE has at 2.2.48) that only predicted nitrogen deposition levels in the SPA's *heathland* is needed or relevant.

78. Thirdly, HE has still not presented modelled nitrogen deposition increases from the DCO Scheme which show by how much, either alone or in combination, it will slow down a downward trend in nitrogen deposition (slow down any improvement) or which show when the nitrogen deposition levels may meet or fall below the critical load, as is required by the SPA's conservation objectives (and not just for those parts of the SPA beyond 150 m from the road).
79. This is essential information needed by the Secretary of State to conduct a legally compliant appropriate assessment.
80. It is without question needed because the SPA's conservation objectives for (as an example) Nightjar include "*Restore as necessary the concentrations and deposition of air pollutants at or below the site-relevant Critical Load or Level values given for this feature of the site on the APIS*" (there are similar targets for the other 2 qualifying species).
81. HE argues that, when examining the future nitrogen deposition rates, the woodland <150m from the road need not be considered, as "*it is important to consider the changes at the location of the supporting habitats for the qualifying features rather than throughout the entirety of the site*" (2.2.51). In response RHS simply refers again to paragraph 76 and 77 above. But furthermore, RHS *agrees* that it is important to consider the changes at the location of the supporting habitats for the qualifying features. And based on HE's *own evidence*, the woodland <150m of the road *is* such supporting habitat. That is exactly why HE concluded in its SIAA (REP4-018) that the land-take from the woodland <150m from the road necessitated by the DCO Scheme "*will therefore result in a reduction in the supporting habitats of the SPA*" (7.4.4) and exactly why HE concluded at 7.4.6 SIAA "*Therefore it is not possible to ascertain that this habitat loss of land [i.e. the land take of the woodland] would have no adverse effect on the integrity of the ...SPA alone as a result of reductions in the extent and / or distribution of supporting habitat of the 3 qualifying specie (i.e. habitat that supports the foraging qualifying species by providing an invertebrate resource) and a potential reduction in food resource.*" HE has clearly acknowledged in the SIAA that woodland <150m from road *is* supporting habitat.
82. Fourthly, in the context of ammonia, HE has wrongly argued (2.2.46 and A.1.5 of REP7-008) that ammonia concentrations are at background levels by 30m from the road, and therefore the contribution of ammonia to nitrogen deposition can be ignored beyond this distance.
83. Freeths LLP's Annex addressed this point at paragraph 53 (REP6-024). This paragraph explained that Figure 2 in Appendix 4 of RHS' REP1-041 shows that both NOx and ammonia follow a broadly exponential decline with distance and that the decline will go beyond the 100m shown out to an infinite distance, so that the



contribution of ammonia to nitrogen deposition must be considered at all distances from the road; it does not suddenly stop at 30m. Figure 2 reflects the well understood dispersion and dilution of pollutants away from a road (this Figure 2 is repeated as Figure 3 in RHS' REP5-049).

84. HE says in 2.2.46 of REP7-008 that Figure 2 in Appendix 4 of REP1-041 is not relevant because the background concentration of ammonia was not measured with the same method as used for the transect points. This is not the case, as the background concentrations referred to in Figure 2 were derived from measurements made across the Ashdown Forest using the same analysers as for the transect points presented in Figure 2. These analysers were both ALPHA and DELTA samplers. Figure 2 is thus an entirely relevant figure to use to understand the change in concentrations of both nitrogen oxides and ammonia on moving away from the road.
85. HE also refers to RHS's Appendix 4 in REP1-041 and states at 2.2.46 that, given that the average measured concentrations at 22m from the road are similar to those measured at 100m from the road, it can be concluded that by 22m, concentrations are indicative of background concentrations. This is presumed to be a reference to Figure 1 of Appendix 4, but, as has been made clear above, it is Figure 2 in Appendix 4 that matters, showing the expected similar decline of both NO<sub>x</sub> and ammonia concentrations with distance, with no sudden stop of the ammonia decline at 22m or 30m.
86. Finally RHS notes that HE is taking full account of nitrogen deposition out to 200m from the road due to NO<sub>x</sub> emissions (see HE guidance LA105 (REP3-020)). The same must therefore equally apply to ammonia. The nonsense of not doing this would be that if HE was right, the lines in Figure 4 in Appendix 4 of REP1-041 would suddenly drop to zero at 30m from the road, which would defy rational science. There is no robust basis for stating that NO<sub>x</sub> should be assessed out to 200 m but that ammonia should not (this is addressed further in REP6-024, para 53 on pdf page 24, and REP8-XXX – the RHS response to HE's response to Q3.4.3 in REP7-004).
87. HE then returns in 2.2.47 to its misplaced view that the contribution of ammonia to nitrogen deposition is irrelevant, because it is irrelevant to consider nitrogen deposition within 150m of the road.

**HE's "red herring" claim that the "woodland buffer" will receive lower levels of nitrogen once the Scheme is operational**

88. NE and HE clearly acknowledge in their Statement of Common Ground ("SoCG") (3.2.13 SoCG REP5-003) that there will be "significant" increases in nitrogen deposition rates within the woodland <150m from the road of the Ockham and Wisley Common component of the SPA. Yet in the SoCG (3.2.13 REP5-003) and in HE's document REP5-024 (at paragraphs 1.1.4 and 1.1.5) HE dismisses these significant woodland increases on the basis that only the level of nitrogen *at the heathland*

>150m from the road is relevant to the integrity of the SPA. This is fully explained in Freeths LLP's Annex REP6-024 (paragraphs 13-18).

89. By now presenting its further assessment of the DCO Scheme's air quality impacts on the SPA's woodland in REP7-008, HE is clearly agreeing with RHS that the woodland <150m from the road *is* relevant to the integrity of the SPA. But in REP7-008, HE still seeks to distance itself from the SoCG conclusion that there will be "significant" increases in nitrogen deposition rates within the woodland <150m from the road. HE states:

*2.2.22 The 'significant increases' referred to in paragraph 3 of the Freeths Annex should not be confused with the identification of a significant effect. An increase in nitrogen deposition of greater than 1% of the lower limit of the critical load is 'significant' in that it requires additional assessment to determine if this would lead to an adverse effect.*

90. HE goes on to states that:

*2.2.23 The SiAA demonstrated, however, that the established woodland buffer will receive lower levels of nitrogen deposition once the Scheme is operational than it currently does. This can be seen by comparing the existing baseline against the in-combination operational scheme effects in Table 8 of the revised Nitrogen Deposition rates within the SPA [REP5-024]; the levels of nitrogen deposition will actually be lower with the Scheme than the existing baseline for all points of all transects within the SPA.*

and

*2.2.24 In addition, as set out in Point 11 of page of 19 of the Applicant's comments on RHS's Deadline 3 submission [REP4-005], the nitrogen deposition rates were historically higher than the current baseline when the site was designated as an SPA in 2005, and yet even then they still provided sufficient invertebrate resource for the SPA qualifying species.*

91. These HE paragraphs 2.2.22 – 2.2.24 are simply a red herring because:

91.1. First, HE has now acknowledged that "*the forecast changes in nitrogen deposition rates [from the DCO Scheme] may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer*" (2.2.12). So HE has acknowledged that the levels of nitrogen deposition from the DCO Scheme in the woodland <150m from the road (whatever those levels are, see above (this is not clear)) *are sufficient* to affect the invertebrate assemblage;

- 91.2. Secondly, HE has acknowledged this notwithstanding HE's view (2.2.23) that *"the established woodland buffer will receive lower levels of nitrogen deposition once the Scheme is operational than it currently does"*;
- 91.3. Thirdly, HE's point that *"the nitrogen deposition rates were historically higher than the current baseline when the site was designated as an SPA in 2005, and yet even then they still provided sufficient invertebrate resource for the SPA qualifying species"* holds no logic because the relevant question is rather how much more invertebrate resource there would be with lower levels of nitrogen;
- 91.4. Fourthly, as already explained in paragraphs 59-69 of Freeths LLP's Annex (REP6-024) and at paragraphs 78-81 above, this does not address a key point, which is the extent to which the DCO Scheme, either alone or in combination, may slow down and possibly prevent the conservation objective target for this component of the SPA to meet / fall under the relevant critical load for nitrogen deposition.

**HE's assertion that RHS's Alternative will have a worse SPA land-take impact on SPA integrity than the DCO Scheme is wrong**

92. HE states:

*2.2.29 As explained in paragraph 4.5.4 of the Applicant's comments on RHS's Deadline 5 submission [REP6-010], the alternative Scheme proposed by RHS Wisley would itself require additional land take from the woodland buffer when compared against the proposed Scheme (approximately 0.47 ha of additional SPA land take would be required for the left turn out of Wisley Lane onto the A3). The physical loss of woodland has been shown to lead to an adverse effect on the SPA that cannot be ruled out beyond reasonable scientific doubt, as explained above. Therefore, with regards to the Habitats Regulations Assessment, an alternative option that leads to increased land take from the SPA cannot be considered to be a better alternative solution.*

93. This point has already been fully addressed in RHS' REP7-040, paragraphs 24-32.
94. In short the land take from the Wisley left turn aspect of the RHS Alternative leads to, by comparison with the DCO Scheme, an additional 3.63m<sup>2</sup> permanent loss of the SPA and an additional temporary impact of 28.0m<sup>2</sup>. However, this is all within the "site fabric" of the SPA<sup>2</sup> and so is completely irrelevant to the integrity of the SPA.

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<sup>2</sup> "Site fabric" is defined by Natural England as *"land and/or permanent structures present within a designated site boundary which are not, and never have been, part of the special interest of a site, nor do they contribute towards supporting a special interest feature of a site in any way, but which have been unavoidably included within a boundary for convenience or practical reasons. Areas of site-fabric will be deliberately excluded from condition assessment and will not be expected to make a contribution to the achievement of conservation objectives"*.

95. This means that the RHS Alternative has an equal impact as the DCO Scheme on the integrity of the SPA in terms of land take from the SPA. The RHS Alternative however is better for the integrity of the SPA in terms of air quality impacts and hence is an “alternative solution”. Furthermore, it would be possible to remove from the RHS Alternative the Wisley left turn whilst retaining the south facing slip roads which would still lead to the RHS Alternative better respecting the SPA than the DCO Scheme with regards to air quality impacts.

**HE has presented no proper assessment of the technical feasibility of HE’s proposed compensatory habitat**

96. HE’s REP4-014 presents HE’s proposed suite of compensatory measures required under regulation 68 of the Conservation of Habitats and Species Regulations 2017. HE proposes a two-fold approach to compensation by providing SPA compensation land and SPA enhancement areas (1.4.1 – 1.4.7 of REP4-014).
97. The SPA enhancement areas (which are within the SPA) will involve heathland restoration through total clearance of 22.5ha of woodland to create open habitat and enable heathland regeneration. HE states at 1.4.7 of REP4-014: “*This will provide more nesting and foraging habitat for the qualifying species, thus increasing their carrying capacity. The heathland regeneration will provide a much more diverse habitat type for invertebrates, thus increasing the food potential of the qualifying species*”. There will also be woodland thinning of 24.9ha in the SPA enhancement areas to support foraging nightjar and woodlark and provide a more diverse habitat type for invertebrates thus increasing the food potential of the qualifying species (1.4.7 of REP4-014).
98. It is clear from Figure 13 of AS-012 “SPA compensation, SPA enhancement and replacement land proposals” that these heathland restoration and woodland thinning areas, are to be located in part in the existing woodland <150m from the road.
99. At paragraph 5.1.37 and 5.1.38 of REP4-018 it is stated that the SPA enhancement measures will “*work to improve the biological value of an area, which is either designated or will be designated, so that the carrying capacity or food potential are increased by a quantity corresponding to the loss affected by the project*”.
100. Table 5.1 of REP4-018 summarises HE’s position with regard to the SPA enhancement measures:
- 100.1. The proposed heathland restoration and thinning measures will result in an overall increase in the invertebrate resource within the SPA.
- 100.2. The increase in heathland habitat will increase the available nesting and foraging habitat for the 3 qualifying features.

100.3. The table concludes “*This enhancement measure will result in an overall increase in the carrying capacity of the SPA for all SPA qualifying species*”.

101. The European Commission Guidance Managing Natura 2000 (November 2018) requires that (bold typeface is RHS’ emphasis):

#### 5.4.4 Key elements to consider in the compensation measures

*The compensatory measures under Article 6(4) must address all issues, be they technical, legal or financial, needed to offset the negative effects of a plan or project and to maintain the overall coherence of the Natura 2000 network.*

*The following list provides an overview of elements to consider:*

.....

*Description of the compensatory measures, accompanied by a **scientifically robust explanation of how they will effectively compensate for the negative effects of the plan or project on the species and habitats affected in light of the site's conservation objectives, and how they will ensure that the overall coherence of Natura 2000 is protected.***

*Demonstration of the **technical feasibility** of the measures in relation to their objectives.*

.....

#### 5.5.2 Effective compensation

*The feasibility and effectiveness of compensatory measures are critical to the implementation of Article 6(4) of the Habitats Directive, in keeping with the precautionary principle and good practice. In ensuring effectiveness, technical feasibility must go hand in hand with the appropriate extent, timing and location of the compensatory measures.*

*Compensatory measures must be **feasible and operational** in reinstating the ecological conditions needed to ensure the overall coherence of the Natura 2000 network.... This must be based on the **best scientific knowledge available, together with specific investigations for the precise location where the compensatory measures will be implemented.** Measures for which there is no reasonable guarantee of success should not be considered under Article 6(4), and the likely success of the compensation scheme should influence the final approval of the plan or project in line with the prevention principle....*

#### 5.5.3 Technical feasibility

*According to current knowledge, it is highly unlikely that the ecological structure and function or the related habitats and species populations can be reinstated to the status they had before the damage by a plan or project. To overcome the intrinsic*

difficulties standing in the way of full success for the ecological conditions, **the design of compensatory measures must:**

**(1) follow scientific criteria and evaluation in accordance with best scientific knowledge, and**

**(2) take into account the specific requirements of the ecological features to be reinstated (e.g. soil, humidity, exposure, existing threats and other conditions critical to the success of reinstatement).**

*The aspects critical to technical feasibility will determine the suitability of the location of compensatory measures (spatial feasibility), the appropriate timing and their required extent. ...*

#### 5.5.5 Location of compensatory measures

Compensatory measures should be **located in areas where they will be most highest effective** in maintaining the overall coherence of the Natura 2000 network. This entails a set of preconditions that any compensatory measure should meet:

.....

*The area selected for compensation **must have - or must be able to develop - the specific features attached to the ecological structure and functions, and required by the habitats and species populations.** This relates to qualitative aspects like the uniqueness of the assets impaired and requires that local ecological conditions be taken into account.*

....

102. It is therefore essential that air quality levels from the DCO Scheme alone and in combination with other plans or projects are taken into account when determining the technical feasibility of HE's proposed SPA enhancement area measures, including the heathland restoration.
103. Yet the air quality levels of the DCO Scheme alone and in combination with other plans or projects have to date played no part whatsoever in the assessment of the technical feasibility of the SPA enhancement areas.
104. The key question, which has not been addressed by HE at all, is taking into account the predicted DCO Scheme in-combination air quality levels at the locations of the proposed SPA enhancement areas, will the proposed SPA enhancement actually secure (as is promised by HE, see paragraph 99 above) that *"the carrying capacity or food potential are increased by a quantity corresponding to the loss affected by the project"*?
105. Linked to this key question above is the further question of the extent to which the SPA's air quality conservation objectives will be compromised in relation to the proposed SPA enhancement areas given the DCO Scheme's in-combination air quality levels at those locations (on which, as noted, no-one except HE has full

information). As is stated at paragraph 5.5.3 of the European Commission guidance, “*compensatory measures must: (1) follow scientific criteria and evaluation in accordance with best scientific knowledge, and (2) take into account the specific requirements of the ecological features to be reinstated (e.g. soil, humidity, exposure, existing threats and other conditions critical to the success of reinstatement).*” Any assessment of the feasibility of the compensation measures must therefore investigate the total levels of nitrogen deposition that the site currently receives or will receive (in combination with other plans or projects) in the future and how those levels relate to the critical loads for heathland (10 Kg/ha/yr).

106. For this purpose, just as for the appropriate assessment, it is critical that full and robust air quality data is presented for the 0m-150m zone of the SPA from the road, indeed for all parts of the SPA where the SPA enhancement areas are to be located. All the points listed above relating to HE’s (to date) deficient air quality information must be rectified by HE, not just to ensure that the Secretary of State may conduct a lawful appropriate assessment, but also to ensure that the Secretary of State may secure the overall coherence of Natura 2000 as per the legal requirement.
107. RHS notes, for example, that HE and NE agree in their SoCG (3.2.17, REP5-003) that “*the primary purpose of the compensation land is to provide invertebrate resource for the SPA qualifying species, as opposed to providing foraging or nesting habitat*”. Given that HE has already acknowledged (2.2.12, REP7-008) that “*the forecast changes in nitrogen deposition rates [from the DCO Scheme] may have a very small effect on the assemblage (i.e. composition) of invertebrate species in the woodland buffer*” it obviously also essential for the Secretary of State to understand how the function and role of the proposed SPA enhancement areas might be affected / curtailed by the in-combination air quality levels from the DCO Scheme with other plans or projects, taking into account (as above) the key prey item and size requirements of the three qualifying species. The qualifying species of the SPA are associated with low nitrogen environments and so it is very likely that the prey species upon which they rely are precisely those species that are disproportionately affected by nitrogen levels.
108. Given that HE’s proposal is in part to create heathland in place of the woodland and that the objective is to provide an invertebrate resource, it is also important to consider that nitrogen deposition reduces areas of open ground within heathland as succession becomes accelerated (see for Appendix 2 of REP1 -043 appendix 2) and areas of bare ground are critical for many heathland invertebrate species (see for example <http://publications.naturalengland.org.uk/file/83047>).

#### **APPENDIX A: COMMENTS ON THE LEGAL ASPECT OF THE FREETHS ANNEX [REP6-025]**

109. The majority of HE’s comments here are irrelevant given that HE has at the same time provided in REP7-008 a further assessment of air quality impacts on the 0-150m

woodland zone of the SPA (albeit that HE's further assessment is flawed, as set out above), thereby confirming the validity of Freeths LLP's submissions in REP6-024.

110. The only point from Appendix A that requires specific response is paragraph A.1.4. Freeths LLP's Annex set out clearly at paragraph 38 why the present case differs from the *Compton Parish Council* case. RHS notes that HE has failed to engage with those 2 reasons, both of which remain entirely valid.
111. The remainder of this page is intentionally blank.



**FURTHER REPRESENTATIONS OF JON BUNNEY OF HATCH REGENERIS ON ECONOMIC IMPACT – SECTION 2.3 OF REP7-008**

Para	Highways England Comment	RHS Response
2.3.1 / 2	<p>At the second issue specific hearing in January 2020 Highways England explained why the survey carried out on behalf of RHS, contained in RHS' representations at REP1-039, is flawed in a number of respects.</p> <p>Highways England also explained in responding to the ExA's second set of written questions at deadline 5 about the survey (questions 2.12.11 – 2.12.13) [REP5-014], why it could not be given any substantial weight.</p>	<p>The RHS made its own representations at the second issue specific hearing in January 2020 explaining why the representations in REP1-039 are not flawed; how they follow Department for Transport and HM Treasury Guidance for assessing economic impacts; and how they provide a considered and robust assessment of the impacts of the DCO Scheme upon the RHS Garden at Wisley.</p> <p>The RHS explained in responding to the ExA's second set of written questions at Deadline 5 about the survey (questions 2.12.11 – 2.12.13) [REP5-054], why it could be given substantial weight.</p>
2.3.3 / 4	<p>Presumably in recognition of the flaws in the initial survey RHS has now conducted two further visitor surveys about the effects of the DCO Scheme on RHS Wisley. However, Highways England does not consider that the two additional surveys satisfactorily address the serious defects in the original survey.</p> <p>Not least the criticisms of the original survey raised by Highways England relating to safety, route utilisation factors and the use of travel time information sourced from Google maps) are not addressed in the new survey work or the report by Hatch Regeneris dated April 2020 [i.e. Appendix 3 of REP6-024]. Moreover, most of the questions in both of the new surveys still refer to journeys to RHS rather than also dealing with journeys from RHS.</p>	<p>The RHS has at no point recognised flaws in the outcomes of the initial survey. Under sustained and unjustified criticism by Highways England, the RHS recognised an opportunity to significantly increase the survey sample size, thus all but eliminating the risk of statistical error within the results, permitting extremely high confidence in the outputs. The results of the new survey not only support the findings of the original surveys (demonstrating there were no flaws), but also add further insight, specifically into construction phase impacts (see REP6-024).</p> <p>The RHS has previously addressed these unfounded criticisms raised by Highways England. Mike Hibbert's submission in REP5-053 (item 4) demonstrates that</p>

		<p>Highways England’s presumptions around safety are flawed. The REP6-024 demonstrates that the RHS data on route utilisation for annual visitors to the RHS Garden at Wisely is more accurate than Highways England presumptions. Google map data for current journey times is based upon a vast number of daily data points that are continuously collected. This source has been applied due to the flaws in Highways England’s modelling of the local highway network (see REP6-024 (Propositions 1.1, 1.2 page 83; Proposition 1.2 page 86; Propositions 1.3b, 1.5 page 87)).</p> <p>Where relevant (e.g. Question 8), the survey questions were rephrased to reflect specific movements to and from the RHS Garden at Wisley.</p>
<p>2.3.5</p>	<p>Perhaps the most significant question in both of the new surveys is question 8; which concerns increased journey times and distances to and from the garden. The phrasing of the questions is likely to cause negative bias, inconsistencies in the analysis and an overestimation any stated reduction in anticipated frequency of future visits.</p>	<p>The restructuring of Question 8 into two sections eliminates any potential negative bias. The Highways England statement that there are inconsistencies, or overestimation of impacts, is incorrect and demonstrates a lack of appreciation of how the data has been applied within the analysis (see REP6-024).</p>
<p>2.3.6 / 7</p>	<p>Question 8 supposes that there will only be increased journey time to and from the gardens as a result of the scheme. However, for some journeys the increase in time will be very small and in other cases there will be a time reduction.</p> <p>The question does not present respondents with alternative trade-off scenarios. Instead, respondents are presented with a single hypothetical scenario of the worst-case increase in journey time and then asked to</p>	<p>The RHS has always accepted that there will be variations in journey time increases and decreases for different routes to and from the Garden at Wisley. This is fully taken into account within the analysis in REP6-024. Question 8 was designed to examine the impact of journey time impacts for trips travelling to and from the south on the A3. The fact that it does not include reference of other journey is of no relevance to the subsequent analysis.</p>

	<p>provide their opinion/response to this worst-case hypothetical scenario having not been provided with any context by way of reasons for the increased journey time and distance. A fairer question would have linked the route options in question 5 to possible responses to question 8.</p>	<p>The design of Question 8 is entirely relevant in understanding the impact of a six-minute increase in journey times to the Garden, alongside a two-minute increase on the return journey. The data been applied within the analysis on this basis. There is no requirement for alternative trade-off scenarios.</p>
<p>2.3.8</p>	<p>The journey time information presented in the question is misleading:</p> <ul style="list-style-type: none"> <li>• In question 8 of Survey 1 (i.e. for the operational phase) the journey time described presumably refers to journeys from the south on the A3 using M25 junction 10 which represents the biggest change in journey times on account of the scheme, but the figures have been rounded up and all other possible routes ignored.</li> <li>• For visitors from other directions (representing approximately 70% of customers), journey times are increased by a much smaller amount or in some cases reduced [REP02-011 – Table 2.8].</li> </ul>	<p>The survey was designed to assess the impact of the largest increase in journey times, which is on trips from the south. The results have been applied on this basis and there was no requirement to ask separate questions about the other routes, which would have substantially added to the complexity of the survey. The journey times were rounded by small fractions to aid the simplicity of the questionnaire survey, but adjusted accordingly and applied on the basis of precise figures within the analysis.</p> <p>The RHS have always fully acknowledged that the impacts vary by route and this is fully taken into account within in our analysis.</p>
<p>2.3.9</p>	<p>No detail is provided about the basis for the increased journey times and distances quoted in question 8 of this survey.</p> <ul style="list-style-type: none"> <li>• These changes in journey times are expected to be minimal. This is on the basis that the existing number of lanes on the M25 and A3 are to be maintained during the construction phase (other than at weekends and overnight) with a reduced speed limit of 50mph imposed. The reduced speed limit will make virtually no difference during the</li> </ul>	<p>The rationale for increased journey times and distances applied is presented within REP6-024.</p> <p>Highways England’s statement that changes in journey times are expected to be minimal is presented without any evidence and belies general experience of the impact of roadworks. Furthermore, Highways England accept their will be impacts during the inter-peak period but have not provided traffic modelling evidence to demonstrate what the scale of these impacts may be.</p>

	<p>morning and evening peak periods, since traffic congestion during peak periods is such that traffic speeds are less than 50mph anyway without the reduced speed limit. Highways England accepts that there would, however, be a small increase in journey times during the inter-peak period due to the reduced speed limit.</p> <ul style="list-style-type: none"> <li>• Describing the construction period as a scenario “...where you are required to travel through 5 miles of roadworks...” (question 8) generates a negative preconception. Firstly, that roadworks are commonly associated with delays and secondly, the question suggests that there will be roadworks occurring continuously over 5 miles, which is not the case.</li> </ul>	<p>The statement “... where you are required to travel through 5 miles of roadworks ...” simply reflects the conclusive fact that roadworks will be in place on the M25 and A3. Whilst the distance will vary depending upon route, speed restrictions are likely to be imposed well in advance of the works to manage traffic flows.</p>
<p>2.3.1 0 / 11</p>	<p>The results from the construction phase survey states that close to 50% of 4981 respondents are likely to change their behaviour as a result of a 5 to 7 minutes added to their journeys (section 3.21 of the Hatch Regeneris report and answering “Definitely yes” or “Probably yes” to question 10). This percentage is significantly higher than the 25% of respondents who are suggested as likely to change their behaviour as a result of an additional 8 minutes to their journeys during the operational phase (section 3.17 and answering yes to question 10 in Survey 1).</p> <p>These findings do not support the argument made by RHS that the greater the increase in journey time the less frequently people are likely to visit the garden.</p>	<p>The survey findings clearly demonstrate the relative impact of roadworks upon individuals’ perceptions of disruption. The results of the two surveys are not simply comparing like-for-like journey time impacts, rather they demonstrates that individuals perceive roadworks more negatively than a straightforward increase in journey times. This is a point the RHS has raised throughout the DCO process and the new survey data provides strong evidence to support its position.</p>

<p>2.3.1 2 / 13</p>	<p>The economic impact methodology and the way it was applied to assess the Wider Economic Impacts assessment of the DCO scheme is inappropriate for the following two reasons:</p> <ul style="list-style-type: none"> <li>• Standard practice for undertaking a Wider Economic Impacts assessment has a national perspective as opposed to the local perspective adopted in the RHS analysis and documented in the Counterculture Report in 2017 [REP3-052] and the Hatch Regeneris report [Appendix 3 of REP6-024]. Wider Economic Impacts assessment should be focused on net additional economic impacts at the UK level, rather than an isolated view of a specific local area or an individual organisation.</li> <li>• Even from a local or regional point of view, the local multiplier approach adopted by RHS is only one step of the entire process to ascertain the local economic impacts of an intervention. UK national additionality guide (<a href="https://www.gov.uk/government/publications/additionality-guide">https://www.gov.uk/government/publications/additionality-guide</a>) sets out established principles for local economic impacts assessment, which covers other key factors to consider such as displacement and substitution, in addition to local multipliers. Neither economic report submitted on behalf of the RHS has considered that potential changes in outputs as a result of the intervention (e.g. visitor number) may be accounted for by opposite changes elsewhere in the region (displacement) or employers may substitute one activity for a similar one (substitution). Both changes will reduce or</li> </ul>	<p>The socioeconomic modelling conducted by Counterculture within REP3-052, which has informed the Hatch Regeneris analysis (REP6-024), follows best practice laid out by the Tourism Intelligence Unit of Office of National Statistics, and incorporates local, regional and national impacts. The Counterculture analysis was fully audited, and accepted, by an independent assessor as part of a funding submission process to the Local Enterprise Partnership.</p> <p>Levels of displacement are dependent upon a range of factors, not least the alternative options available to visitors. As a flagship horticultural garden, of international standing, the direct alternatives to Wisley Garden, are limited. At a local level, displacement is likely to be minimal and the economic impacts reported represent the full economic cost to the local economy, represented through Wisley Garden, its network of suppliers, as well the wider support it provides to the horticultural industry. Whilst some displacement may occur at regional and national levels, the overall impacts would still be highly significant.</p> <p>The RHS has grave concerns about the impact the DCO Scheme will have upon its charitable and heritage operations, as well as the support it is able to provide to the wider horticultural industry, and the economic analysis provides the evidence to supports these concerns.</p>
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	<p>completely offset the forecast economic impacts, and therefore the current evidence presented in the RHS analysis is incomplete.</p> <p>Taking points 1 and 2 above together, there is no evidence to suggest that any forecast reduction in visitors to RHS Wisley (although Highways England does not accept that there will be any reduction)) will lead to net loss at the national level in terms of consumer spending in the economy and the knock-on impacts (tier 2 and tier 3 impacts as termed in both aforementioned RHS reports) on their suppliers and suppliers' employees.</p>	
<p>2.3.1 4</p>	<p>These findings do not support the argument made by RHS that the greater the increase in journey time the less frequently people are likely to visit the garden and Highways England remains of the opinion that no substantial weight ought to be given to the economic impact reports submitted on behalf of RHS.</p>	<p>The findings from REP6-024 fully support the case that the operational phase of the DCO Scheme will have significant economic impact upon the operations associated with the RHS Garden at Wisley and, furthermore, that the impacts associated within the construction phases will be proportionally higher as a result of the perceived level of disruption resulting from roadworks during this period.</p> <p>The RHS considers that the substantial body of evidenced analysis presented means that substantial weight can be given to the economic impact reports submitted. This compares to the complete absence of any specific analysis conducted by Highways England to support its position.</p> <p>The RHS has from the outset articulated the threat the Scheme presents to the economic viability of its flagship garden, a nationally important heritage asset, and undergoing transformational capital investment. The</p>

		<p>applicant has not addressed this in any way with regard to for example, NPPG guidance on Heritage Assets, or the impact on Approved Projects within Guildford Borough Council (Wisley having secured significant planning approvals to allow its development).</p> <p>In the absence of any comparable Economic Impact Study by the Applicant, the RHS analysis, including a resurvey response to the Applicants comments, is the best and only information available to the Examining Authority.</p>
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**RHS TABLE OF COMMENTS ON D5 SUBMISSIONS (HIGHWAY MATTERS) – APPENDIX 1 OF REP6-024 – SECTION 2.4 OF REP7-008****Ref 2.13.10**

112. The RHS position that their Alternative Scheme has never been modelled by HE remains. Whilst the ExA have requested that the South Facing Slips are modelled by HE, the output from the model is awaited.
113. Within its response HE acknowledges that at the time they prepared its Side Road Addendum Report (REP3-017) their model was showing that ALL (rather than NONE) of the Wisley Lane traffic to/from the south was routing via the A3 rather than via the local villages of Ripley and Send. It remains unclear why such a significant shift in the model occurred between pre and post DCO submission. The difference between the two routes has always been significant.
114. For the reasons set out above (under the heading of Highways and Traffic) RHS maintains its position that its proposed left turn slip arrangement is both an improvement over the existing Wisley Lane connection with the A3 and would provide a safe connection with the A3, which would remove u-turning traffic and unnecessary additional travel (which in itself would have safety implications).

**Ref 2.13.18**

115. HE's claim that the RHS Alternative would require a departure from standard in respect of weaving length is incorrect and further drawings have been shared with HE as part of the Statement of Common Ground discussions which demonstrate this.

**Ref 12**

116. RHS comments in respect of this item remain valid – they are based on HE's model output.

**1 May 2020**



## APPENDIX



## Further evidence relating to the effects of nitrogen on invertebrates.

Andrew Baker FCIEEM  
April 29<sup>th</sup> 2020

1. Artificially elevated levels of Nitrogen have been shown in some studies to affect herbivorous insects. In the early years of research it was thought that insect productivity was nitrogen (N) limited and therefore, in response to elevated levels of nitrogen in the environment and consequential increases in N levels in plant tissues, insects feeding on the plants then benefited from the elevated N. This became known as the nitrogen limitation hypothesis (White 1993).
2. However, more recently the nitrogen-limitation hypothesis has been found to be incorrect both by experimental evidence and observational data that has tracked the continued decline of invertebrate populations. Had the nitrogen-limitation hypothesis been correct then one would have expected populations of Lepidoptera (moths and butterflies) to have increased as a consequence of intensification of farming (wide use of nitrogen fertiliser) and increased atmospheric nitrogen deposition. This has however not been the case; indeed, the opposite has occurred, populations of Lepidoptera have shown marked declines (e.g. The State of the UK's Butterflies 2015 and The State of Britain's Larger Moths 2013). It is now known that the effects of N deposition are much more complex than the nitrogen limitation hypothesis suggested and that while some species may benefit, over all the effects of N deposition on invertebrate populations are negative. Fischer and Fiedler (2000) found through experimentation that increased levels of N in the host plants of copper butterfly was detrimental and while growth rates were elevated for those individuals fed on high nitrogen host plants so mortality rates of larvae and pupae also increased (six-fold increase for the pupal stage). Pupal and adult weight was also reduced in individuals that were reared on food plants with high N levels. Fischer and Fiedler concluded that elevated N levels were not beneficial to copper butterfly and *'Threats do not only emerge from the application of fertilisers on grassland, but from atmospheric N depositions concerning whole landscapes as well' .....**'Changes in the nutrient balance of the host plant may well play a role in the*

*ongoing and regionally dramatic decline of this once abundant herbivorous insect in intensively managed landscapes of Europe’.*

3. The same phenomenon was also explored by Kurze et al (2018) who examined the effects of increased host plant nitrogen levels on six species of common butterfly and moths. They found that, in all six species tested, survival rates were reduced when N levels were elevated. Kurze et al challenged the nitrogen limitation hypothesis concluding that *‘host-plant quality changes due to agricultural fertilization or atmospheric nitrogen deposition might substantially contribute to the range-wide decline of Lepidoptera species in Western and Central Europe.’*

#### References

- White TCR (1993) *The inadequate environment—nitrogen and the abundance of animal*. Springer, Berlin, Heidelberg
- Klaus Fischer · Konrad Fiedler (2000) Response of the copper butterfly *Lycaena tityrus* to increased leaf nitrogen in natural food plants: evidence against the nitrogen limitation hypothesis. *Oecologia* (2000) Vol 124: pp235–241
- Kurze, Heinken, Fartmann 2018 , Nitrogen enrichment in host plants increases the mortality of common Lepidoptera species *Oecologia* Vol 188: pp1227–1237