

RHS RESPONSE TO THE EXAMINING AUTHORITY'S FOURTH WRITTEN QUESTIONS AND REQUESTS FOR INFORMATION (EXQ4)

	Question to		RHS response
1.	General		
2.	Principle and nature of the development,		
4.2.1	Royal Horticultural Society (RHS) and Applicant	The ExA notes that throughout the Examination the RHS has sought to argue, cumulatively through its air quality, ecological and socio-impact submissions, that without the inclusion of the full 'RHS Alternative Scheme' (south facing slips at the Ockham Park junction and a left out from Wisley Lane) the Proposed Development's air quality impact upon the integrity of the Thames Basin Heaths Special Protection Area (the SPA) would be higher than it might otherwise be, through the additional distance travelled by some visitors to RHS Wisley, while also contending that some visitors being faced with longer journey distances and/or times would be deterred from making visits to your gardens, resulting in a loss of income for the RHS. It appears that when the strands of the RHS's Examination case are taken together there are three scenarios that could flow from it:	None of the three scenarios accurately reflect the RHS's case. The ExA rightly notes that the RHS's case is that the DCO Scheme would result in a reduction in visitor numbers to RHS Wisley, but there is no evidence before the ExA on which it could properly conclude that the associated reduction in vehicular traffic movements to and from RHS Wisley would mean that the DCO Scheme would not have an adverse impact on the SPA. It follows that whether on HE's case (no reduction in visitor numbers) or on the RHS's case (substantial reduction in visitor numbers) the position remains that it would be unlawful for the Secretary of State to confirm the DCO Scheme without first having considered whether there are alternative solutions (such as the RHS Alternative Scheme) which would have less impact on the integrity of the SPA.

		<p>1) Scenario one - the operation of the Proposed Development would result in reduced visitor numbers and income for the RHS, with a consequent reduction in vehicular activity and emissions within the SPA attributable to RHS Wisley visitors and thus less of an effect on the integrity of the SPA due to air quality effects.</p> <p>2) Scenario two - in spite of the Proposed Development involving greater journey distances and/or times in getting to and from the gardens that would not act as a significant deterrent to visitor numbers, with the result that the RHS would not experience loss of income at the levels projected by Hatch Regeneris in its reports [REP1-039, and appended to REP6-024], but that there would be additional vehicular movements and emissions within the SPA, which the RHS contends would be to the potential detriment of the SPA's integrity.</p> <p>3) Scenario three - there would be a combination of some loss of visitor numbers to the gardens and some income for the RHS, but some additional vehicular activity and emissions in the SPA, but that neither the loss of income for the RHS nor any potential effects on the integrity of the SPA would be as significant as has</p>	
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		<p>been argued.</p> <p>Of the three potential scenarios outlined above, please identify which one best fits the case the RHS is seeking to make, and comment on the implications of this.</p>	
3.	Air quality and human health		
4.3.2	<p>Applicant, Natural England (NE), Elmbridge Borough Council (EBC), Guildford Borough Council (GBC) and RHS</p>	<p>You are all requested to provide your organisations' corporate views on the effect of the Government's evolving policy to reduce vehicle emissions might have for the consideration of the air quality impacts of the Proposed Development. In replying to this question, you should provide an indication of:</p> <p>1) the individual emissions types that might change and the magnitude of change for those particular emissions; and</p> <p>2) how any changes to emissions may arise over time, using 2015 as the base year, and plotting any changes on a graph of a form that you consider most appropriate to depict the information being provided.</p>	<p>The Government's policy to reduce vehicle emissions has been to rely on Euro standards to control emissions from new vehicles. The UK is currently at Euro 6 for cars and vans and Euro VI for lorries, buses and coaches. There are no imminent further Euro standards to reduce emissions. The current standards cover NOx emissions and PM. The change to Euro six standards is still working its way through the system as new vehicles replace older vehicles, so for a few more years emissions of NOx will continue to reduce. Ammonia emissions are unlikely to reduce much in future years, and may even increase due to petrol cars replacing diesel cars in the fleet and greater emissions from Euro VI heavy duty vehicles (see REP5-049).</p> <p>The question asks what effects the Government's evolving policy to reduce vehicle emissions might have for the consideration of the air quality impacts of the Proposed Development.</p> <p>This question can be addressed by considering the potential future projections of nitrogen oxides and ammonia emissions and associated nitrogen deposition rates in RHS document REP5-049. The projections cover a) the implications of a decrease of diesel vehicles in the fleet, which, while not a policy option, will have a significant effect, especially for ammonia; and b) an electrification of</p>

			<p>the car fleet, which is currently being discussed as a policy option. The projections cover ranges, as there can be no certainty as to how these two effects might occur in practice, i.e. there is no one certain (or even highly likely) projection of the future.</p> <p>Figure 19 of REP5-049 illustrates the likely change from 2017 (the values would be a bit higher if they were projected back to 2015) in nitrogen deposition due to road traffic emissions of NOx and ammonia. Deposition rates in this example flatten off from about 2025 onward.</p> <p>Because petrol cars emit more ammonia than diesel cars (as discussed in REP5-049), a change in fleet composition to more petrol cars than assumed in the EFT fleet will lead to greater nitrogen deposition (see Figure 21 of REP5-049).</p> <p>Figure 22 of REP5-049 illustrates that an increased use of electric cars would have the opposite effect. The dashed lines in this graph show increased electrification over the EFT base level of 2.1%. So, the red dashed line represents 22.1% of the whole car fleet being electric in 2030. Even this lower value should be considered highly uncertain given that it is not a current commitment, and would require most new car sales towards the end of the decade being electric vehicles (not hybrid).</p>
4.3.3	Applicant	In Appendix B of REP5-003 (as amended by REP8-022) you provide in- combination predictions for the heathland part of the SPA but not for the area within 150m from the road i.e. the woodland buffer. Please provide modelling in regard to nitrogen deposition rates in combination with other plans or projects, including the	The RHS notes that it has been asking for this information for several months but the HE has consistently refused to provide it.

		ammonia contribution, for receptors in the SPA within 150 m of the road.	
4.	Biodiversity and Habitats Regulations Assessment		
4.4.1	Applicant, NE and RHS	<p>The ExA notes the answers made at Deadline 7 to its third written question 3.2.2 (any implications of the Court of Appeal’s judgement concerning the Airports National Policy Statement) [PD-016]. With respect to ‘... any in-principle type considerations raised in the recent Court of Appeal judgement ...’ do you have any comments to make with respect to the Court of Appeal’s findings with respect to the consideration of ‘reasonable alternatives’ under the Habitats Directive?</p> <p>Note: The Court of Appeal judgement (Plan B Earth v Secretary of State for Transport [2020] EWCA Civ 214 (27 February 2020)), while being widely accessible is currently not an Examination document. The ExA therefore requests the Applicant to submit this Court of Appeal judgement so that it can be added to the Examination Library and referred to by the ExA in its recommendation report to the Secretary of State should it consider it necessary to do so.</p>	<p>The RHS notes the Plan B Court of Appeal judgment, which includes discussion of the “no alternative solution” test of the Habitats Directive. (Please note however that “reasonable alternatives” referred to in ExQ4 4.4.1 is a term derived from the SEA Directive which is not relevant to the DCO Scheme). The Plan B judgement has no particular relevance in so far as the RHS Alternative is concerned, because the RHS Alternative is a feasible alternative solution in this case.</p>

4.4.2	NE and Surrey Wildlife Trust (SWT)	<p>Please comment on:</p> <p>a) How dependent the breeding populations of Dartford warbler, European nightjar and Woodlark (the SPA's qualifying features) are on the invertebrate assemblage present in the woodland adjacent to the M25 and A3 and which forms part of the SPA. Do these qualifying features require particular species as part of their diet? Are they specialist or generalist in their dietary requirements?</p> <p>b) whether there is any notable difference in the nature of the invertebrate assemblage found in the woodland and heathland areas of this part of the SPA, and if there is a notable difference what form does that take?</p> <p>c) what is the sensitivity of the invertebrate assemblage present in this part of the SPA to the level of Nitrogen deposition?</p> <p>d) having regard to the predicted air quality levels within the various proposed SPA Enhancement Areas and Compensation Land areas, how confident are you that they will be able to function so as to offset any potential loss in carrying capacity and/or food resource as a result of the Proposed Development?</p>	<p>Note: In relation to Q4.4.2(c), please see the RHS response to 4.4.13 below.</p> <p>Note: Q4.4.2(d) cannot be accurately answered until the information requested at ExQ4 4.3.3 has been made available.</p>
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4.4.7	NE, Applicant and RHS	<p>Has the Institute of Air Quality Management or any other UK professional body, such as the Chartered Institute of Ecology and Environmental Management, produced any guidance requiring the effects of ammonia on SPAs to be assessed? If any such guidance has been produced, then a copy of it should be submitted. Only one copy of any such guidance need be submitted and NE, the Applicant and the RHS should decide between themselves as to which organisation is best placed to submit it.</p>	<p>The ExA is referred to the following three documents:</p> <ol style="list-style-type: none"> 1) Air Pollution Information System (APIS): 'Starter's Guide to Air Pollution and Pollution Sources' (downloaded on 26 May 2020) together with the APIS overview note on 'Ammonia' (downloaded on 28 May 2020) (copies provided). 2) Natural England: Internal Guidance – Approach to Advising Competent Authorities on Road Traffic Emissions and HRAs (v1.4, June 2018, copy provided); and 3) the Institute of Air Quality Management (IAQM): 'A guide to the assessment of air quality impacts on designated nature conservation sites' (version 1.1 May 2020, copy provided). <p><u>The APIS 'Starter's Guide' and overview note on Ammonia</u></p> <p>The APIS Starter's Guide shows that it is now well recognised that road transport is one of the key sources of ammonia pollution:</p> <p>Page 1 makes clear that ammonia is one of the primary pollutants which "can travel long distances" and for which critical load can be used as a criterion by which to assess its environmental impact. Page 2 of this document (see the "Pollutant Source" table) clearly identifies that "road transport" is regarded as a source of ammonia, together with the "chemical industry" and "agricultural / intensive farming".</p> <p>Further, page 1/3 cross-refers to further APIS pollutant-specific "overview" notes. The overview note on 'Ammonia' states on page 1/8 that: "Ammonia comes from the</p>
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			<p>breakdown and volatilisation of urea. Emissions and deposition vary spatially, with "emission hot-spots" associated with high-density intensive farming practices. Other agriculture-related emissions of ammonia include biomass burning or fertiliser manufacture. Ammonia is also emitted from a range of non-agricultural sources, such as catalytic converters in petrol cars, landfill sites, sewage works, composting of organic materials, combustion, industry and wild mammals and birds (Sutton et al. 2000, Wilson et al. 2004)" (emphasis added).</p> <p><u>Natural England Internal Guidance</u></p> <p>The Natural England Internal Guidance makes clear that the effects of air pollution, including ammonia, on European sites must be assessed.</p> <p>Section 2 provides an overview of "<i>how might European sites be adversely affected by air pollution.</i>" The Guidance then states (bold emphasis added):</p> <p>"Air pollution that typically affects habitat will include dust and particulate matter (PM), nitrogen oxides (NOx), ammonia (NH3) and sulphur dioxide (SO2). Each proposal type will have emissions typically associated with its specific activity. For example, ammonia is typically associated with farming or waste management. Combustion sources such as industry or traffic are more likely to be associated with nitrogen oxides and particulate matter" (para 2.1)</p> <p>Section 4 (on the HRA screening test) further states:</p> <p>"When considering the potential for in-combination effects, a competent authority should also recognise that different</p>
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			<p>proposal types ('sectors') and different pollutants (e.g. ammonia (NH3), nitrogen oxides (NOx and NO2)) can combine together to have the same or similar effect on a given area of habitat. By way of example, nitrogen deposition on a site can result from both the emissions of ammonia from a farm source and also from emissions of nitrogen oxides from a traffic source, with both having an eutrophication effect" (para 4.41)</p> <p>Whilst the Natural England Guidance makes no specific mention of ammonia from road traffic (since (presumably) at the time of writing the Guidance the contribution of ammonia from traffic was not fully recognised) it is nevertheless clear from the Guidance that, given that ammonia is now known to arise from traffic (see APIS document above), this must be covered in a HRA. For example (bold emphasis added) the Natural England Guidance states:</p> <p>"This guidance is applicable when Natural England gives its advice on plans and projects involving the following;....</p> <ul style="list-style-type: none"> • Emissions from proposed road schemes" (para 1.13) <p>"Any emissions from road traffic associated with a specific proposal and the proximity to European sites should be considered in the consultation documents. If they are not, further information should be requested from the competent authority consulting Natural England" (para 4.7)</p> <p>"The appropriate assessment should focus on assessing more precisely the ecological impacts of the emissions on the site in view of its qualifying features and conservation objectives. It should take into account any detailed modelling that is or becomes available, the best available evidence as to ecological impacts, background levels and</p>
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			<p>likelihood for future reductions. Natural England will be consulted by the competent authority for the purposes of the assessment and asked for its advice (step 6)” (para 3.7)</p> <p>“The impacts resulting from a change in the atmospheric concentration or deposition of pollutants as a result of the plan or project might include:....” (para 5.10)</p> <p><u>IAQM guidance May 2020</u></p> <p>The IAQM has reissued its guide to the assessment of air quality impacts on designated nature conservation sites. This supersedes the June 2019 guidance that the RHS referred to in REP8-054 (para 69, page 14), when RHS said:</p> <p>“this guidance [June 2019] 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 <i>“The impacts from different pollutants also need to be considered, such as the impact on deposition of nitrogen derived from NOx and NH3. For example, the NH3 contribution from agricultural activities may need to be considered together with NOx and NH3 emissions from road transport”</i>. The IAQM thus clearly recognises that both NOx and NH3 emissions arise from road transport. It is therefore misleading for HE to say in 2.2.44 [of REP7-008] that the IAQM <i>“does not consider there to be a requirement for assessing the contribution of ammonia from road vehicles ...”</i>. (Paragraph 5.2.11 remains unaltered in the May 2020 update)</p> <p>The updated IAQM guidance (May 2020) goes further and now has explicit guidance to consider including ammonia from road traffic. This is set out in section 5.5.4 on Traffic impacts (page 28 of the guidance):</p>
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			<p>“5.5.4.1 There is evidence that ammonia emissions from road vehicles may contribute more than half the local traffic related increment to nitrogen deposition.</p> <p>5.5.4.2 The DMRB methodology only requires the assessment of NO_x emissions and nitrogen deposition. It does not consider NH₃ or its contribution to nitrogen deposition. As road transport is a source of ammonia, albeit a small source compared to agriculture at a national level, consideration should be given to including it and its contribution to local nitrogen deposition.”</p> <p>Appendix D to the guidance, remains unchanged, and provides additional background:</p> <p>Paragraph 2.5 refers to Appendix D (Air pollutants and deposition processes). Appendix D makes clear that ammonia is a key pollutant to take into account. It states:</p> <p><i>“The main air pollutants affecting vegetation and ecosystems are nitrogen oxides (NO_x), sulphur dioxide (SO₂) and ammonia (NH₃). Ozone (O₃) is also important but this pollutant is not addressed by this guide as it is a regional pollutant not assessed at scheme or project level”</i> (para D.2.1)</p> <p>Furthermore paragraph 7.1 states:</p> <p>“There are a number of principles that should be applied when undertaking assessments of the air quality impacts on designated sites, which are set out below.</p> <p>...</p> <p>2. A precautionary approach is required</p> <p>...”</p>
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			<p>And paragraph 7.3 states:</p> <p>"In addition, the general principles of risk management remain applicable when the precautionary principle is invoked. These are the following five principles: ... review of the measures in the light of scientific developments." (para 7.3.3)</p> <p><u>Chartered Institute of Ecology and Environmental Management</u></p> <p>Finally, the Chartered Institute of Ecology and Environmental Management (CIEEM) is currently developing an advice note on assessing ecological impacts of air quality. Although it is not yet published, the RHS understands from CIEEM (pers comm) that the text will advise that ammonia from all sources (i.e. including traffic) be included in a Habitats Regulations Assessments.</p>
4.4.8	NE	<p>At paragraph 68 of REP8-054 the RHS has stated that it recognises that the '... Emissions Factors Toolkit does not include ammonia ...'. Please comment why you consider the Emissions Factors Toolkit does not refer to ammonia and set out what you consider to be the implications of this omission in regard to the Proposed Development.</p>	<p>The reason why the Emissions Factors Toolkit (EFT) does not include reference to ammonia is that the EFT was established to support local authorities carrying out their local air quality management (LAQM) duties under the Environment Act 1995. The focus for local authorities in this regard is the human health impacts of air quality arising from two pollutants, particulate matter and nitrogen dioxide. The EFT therefore provides emission factors to allow these pollutants to be modelled and does not consider ammonia. Whilst ammonia is not a pollutant of concern in relation to human health, it is of concern for its effects on habitats, because it is highly reactive biologically, giving rise to direct effects on some plant species, as well as adding to nitrogen loads to ecosystems. This is clear from the APIS "overview of ammonia"</p>

			<p>document provided in the RHS answer to Q4.4.7 above.</p> <p>As the EFT does not need to provide emission factors for ammonia, it has been necessary to look elsewhere for emission factors. There is no standard method currently available, so Air Quality Consultants Ltd has developed a new tool to allow modelling for ammonia from motor vehicles (the CREAM model as set out in REP5-049). This model is freely available for HE to use in its assessment of the DCO Scheme, although it is accepted by RHS that a conservative estimate of the ammonia contribution to nitrogen deposition would be to double the NOx derived contribution, if HE is unable to model ammonia emissions.</p>
4.4.9	NE	<p>At paragraph 67 of REP8-054 the RHS has referred to ammonia from road traffic having been incorporated into the assessment in connection with the preparation of the Local Plans for Wealden District Council, Epping Forest District Council and Havant Borough Council. Please explain why you consider ammonia emissions from road traffic has been considered in connection with the preparation of the Local Plans for each of the previously mentioned local planning authorities.</p>	<p>To assist the ExA, extracts from the recent local plan HRAs for Epping Forest DC and Havant BC are provided (as a separate document) <i>[copy supplied as Appendix A to the RHS' Deadline 10 Submissions]</i>. The text has been highlighted in several places to show clearly that ammonia from road traffic has been included in the assessments.</p> <p>The HRA for the Wealden DC local plan cannot be provided, as the relevant material has been removed from the council's website. Nevertheless, ammonia from road traffic was included and this was not objected to by Natural England.</p>
4.4.10	RHS	<p>Please advise whether the report prepared by Air Quality Consultants and entitled 'Ammonia Emissions from Roads for Assessing the Impacts on Nitrogen-sensitive Habitats' of February 2020 [REP5-049] has or has not been subject to peer review. Any</p>	<p>This report has not been peer reviewed in the sense that an academic paper is peer reviewed. This report is non-academic (i.e. was not written for the purpose of publication in an academic / scientific journal) and so would not be expected to be "peer reviewed".</p> <p>Nevertheless Prof. Laxen, who approved the report, has</p>

		peer review documentation should be submitted in full.	<p>been a member of Defra’s Air Quality Expert Group and is a Fellow of the Institute of Air Quality Management. Prof. Laxen has experience of publishing over 70 papers and peer reviewing academic papers over many years.</p> <p>Further details of the qualifications of the authors of the report and the basis for attaching significant weight to it are set out in REP8-053 responding to ExQ3 question 3.4.3. For ease this paragraph reads, “The document (REP5-049) has been prepared by leading air quality experts in the UK. Prof. Laxen has been a member of Defra’s Air Quality Expert Group (AQEG), has published over 70 papers, most in the peer reviewed literature, and is a Fellow of the Institute of Air Quality Management (IAQM). Dr Marner (the principal author) is currently an ad-hoc member of AQEG, having most recently been retained by Defra to advise on exhaust emissions, including ammonia, from road vehicles. Both are currently involved in a project on Nitrogen Futures, a study being led by the UK Centre for Ecology and Hydrology (UKCEH) on behalf of the Joint Nature Conservancy Committee.”</p>
4.4.12	NE	In REP8-054 the RHS has criticised the Applicant’s reliance on overall invertebrate biomass considerations in reaching its conclusions. However, in REP9-003, page 10, the Applicant contends that the ‘established woodland buffer will continue to function in the same way as it currently does and provide the same invertebrate resource as it currently does’ and has referred to both the assemblage and biomass of the	This question cannot be answered correctly until the information requested at ExQ4 4.3.3 has been made available by the Applicant.

		<p>invertebrate resource being unchanged. Please comment on this, having regard to the particular prey requirements of each of the qualifying features of the SPA and the potential impacts of emissions resulting from both the Proposed Development and the 'RHS Alternative Scheme' on these prey species of the SPA qualifying features. Also please comment on the impacts on invertebrates and the SPA qualifying features as a result of any changes to the woodland buffer, for example through habitat management in the proposed enhancement areas or the erection of the Cockcrow Bridge.</p>	
4.4.13	RHS, NE and Applicant	<p>In REP8-054 the RHS cites evidence that demonstrates an effect due to Nitrogen deposition on moth species that are adapted to low Nitrogen levels. How sensitive is the invertebrate assemblage in this part of the SPA to the effects of Nitrogen deposition?</p>	<p>The current research into the effects of nitrogen on invertebrates has identified that populations are negatively affected by nitrogen deposition (see for example REP8-054). The ExA has asked about the sensitivity of invertebrate assemblages to the effects of Nitrogen, sensitivity being how invertebrate communities respond to increasing levels of Nitrogen. There is however no evidence on the specific sensitivity of either individual species or assemblages of moth species or of other invertebrates, to increased nitrogen. This would require dose response curves to be determined (i.e. how the invertebrate species and diversity and overall invertebrate biomass is reduced in response to specific doses of nitrogen). The scientific literature on the response of plants to increased nitrogen levels (i.e. plants' sensitivity to nitrogen) is however very well documented and has informed the establishing of critical loads and levels for habitat such as heathland and woodlands. In the absence of specific sensitivity data on moth species or other invertebrate species it is reasonable</p>

			to apply the critical loads and levels that have already been established by the scientific community as published on APIS and reflected in the Thames Basin Heath SPA's conservation objectives for supporting habitat (note that these conservation objectives do apply to the SPA's woodland – Highways England confirms (in its SIAA REP4-018 7.4.4-7.4.7) that the SPA's woodland is supporting habitat for the purpose of the SPA's conservation objectives). These critical loads and levels provide an indication of the likely sensitivity of invertebrates to increases in nitrogen (i.e. if critical loads are being exceeded it is likely that invertebrate populations are adversely affected).
4.4.15	NE	Please comment on the RHS's contention in REP9-014 that the conclusion you have drawn in your Statement of Common Ground [REP8-022] is incorrect in regard to the potential impact on air quality of the SPA woodland areas within 150m of the roads. Also, please comment as to whether or not air quality effects could hamper any future restoration of the woodland buffer, if so required.	In relation to the part of this question "Also, please comment as to whether or not air quality effects could hamper any future restoration of the woodland buffer, if so required", please note that it cannot be answered correctly until the information requested at ExQ4 4.3.3 has been made available by the Applicant.
4.4.16	Applicant and RHS	Please provide your respective precise calculations for any differences in Nitrogen disposition within the SPA, up to 200 metres from the outer edge of the carriageway of the widened M25 and A3, when the effects of the submitted Proposed Development are compared with the full 'RHS Alternative Scheme', ie the presence of south facing slip roads at the Ockham Park	The RHS has not at any stage set out itself to model the concentrations of NOx or ammonia, and their contributions to nitrogen deposition, within the SPA from the DCO Scheme or the RHS Alternative. RHS does not have the resources to undertake this task. RHS instead relies on Highways England to provide the requested information and the comparison between the DCO Scheme and the RHS Alternative Scheme asked for by the ExA. RHS has already raised concerns about the

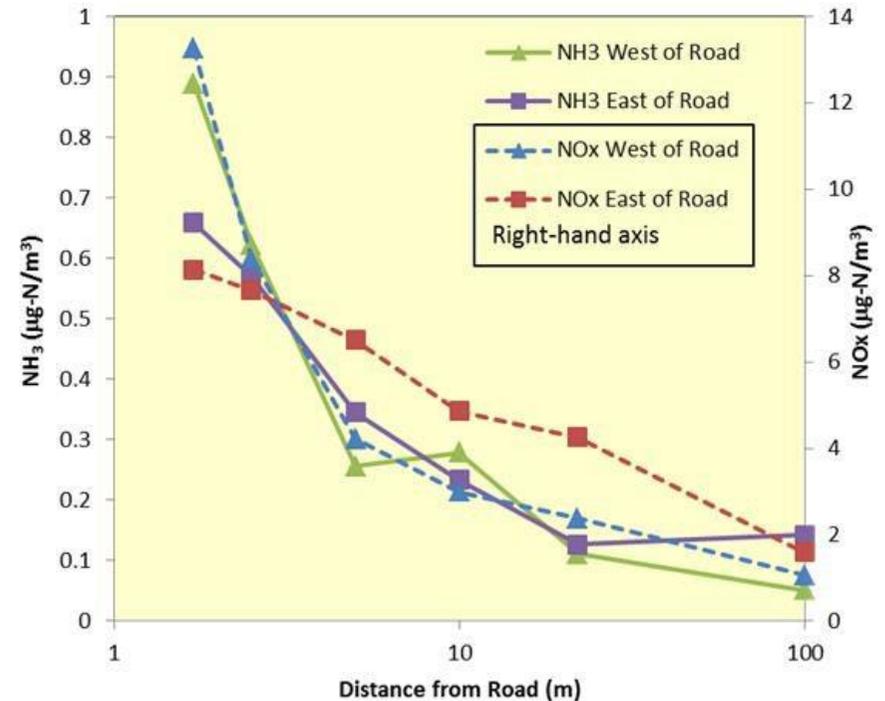
		<p>junction and a left turn from Wisley Lane. In responding to this question, the ExA is expecting to be provided with:</p> <ul style="list-style-type: none"> • confirmation of what data is being used to underpin the calculations; • a written summary of any assumptions made; • the step by step methodology for undertaking the calculations; and • the actual worked calculations. 	<p>modelling of the DCO Scheme and so, therefore, wishes to emphasise that the comparison requested must:</p> <p>(i) be underpinned with all appropriate input data, i.e. traffic flows, baseline concentrations and deposition rates, emissions of all relevant pollutants etc.; and</p> <p>(ii) present a full set of concentration and deposition results, covering the DCO Scheme both alone and in combination with other plans and projects, and taking account of emissions of both nitrogen oxides and ammonia, with the result presented for all receptor points in the 6 transects, with the same information then provided for RHS Alternative Scheme to allow the requested comparison.</p> <p>RHS is keen to work with HE on agreeing the comparison between the DCO Scheme and the RHS Alternative Scheme, once it sees the full information that is to be provided by HE in response to this ExQ4 question.</p>
4.4.18	RHS	Please provide into the Examination a copy of the paper by Alexander and Cresswell (1990) 'Foraging by Nightjars <i>Caprimulgus europaeus</i> away from their nesting areas' that is referred to in REP8-054.	This is being provided by the RHS <i>[copy supplied]</i> .
4.4.19	Applicant and RHS	With respect to the consideration of Ammonia emissions there continues to be disagreement between you about the interpretation of the concentration data shown in Figures 2 and 3 contained in REP5-049, for example in REP7-008 and REP8-054. It appears to the ExA that Figure 2 shows consistently higher concentrations of Ammonia up to around 30 metres from	<p>With regard to Figure 2 in REP5-049, the ExA is correct in saying that it shows a levelling-off in concentrations on moving away from the road. This is because of the well understood exponential decline of concentrations of both NOx and ammonia (and other pollutants) with distance away from a road.</p> <p>Furthermore, the ExA rightly points out that, based on Figure 2, concentrations of ammonia at between 100 to 110 metres have levelled off and are close to the annual mean</p>

the centre line of the road that was surveyed and that there is then a levelling off in the concentration of Ammonia at between 100 and 110 metres on both the eastern and western sides of the road. If there is not a levelling off the Ammonia concentration at between 100 to 110 metres to an annual mean background concretion of the order of 0.6 to 0.8 micrograms per cubic metre for two nearby transects, then what might else explain what is shown in Figure 2 with respect to the concentration of Ammonia in the surveyed location?

background concentration.

However, Figure 2 of REP5-04 is not telling the full story because it does not show the local background concentration, and therefore does not show the road increment above background.

Figure 3 of REP5-049 (reproduced below for ease) shows the road increment in ammonia above the local background ammonia level (for the same data as shown in Figure 2). It also shows the NOx results for these same locations.



This Figure 3 shows clearly that, for both ammonia and nitrogen oxides, the concentrations are not completely

			<p>down to background levels, at a distance of 100-110m.</p> <p>Hence Figure 3 shows that there is no basis for assuming that ammonia concentrations due to road traffic are at background levels at 30m from the road and can be ignored beyond this distance, as is suggested by Atkins on behalf of Highways England in representations to this inquiry (see for example REP8-022, section 3.3.1, page 29). It also shows that the declines are similar for both NOx and ammonia.</p> <p>This pattern of decline with distance of both ammonia and NOx that is evident in the monitoring results shown in Figures 2 and 3 is perhaps illustrated more clearly in a larger set of measurements carried out by Highways England on transects covering different distances from numerous motorways and trunk roads in England.</p> <p>The result of these measurements, together with the curve superimposed from Highways England's current screening model (described below), are shown in the Figure X below. This figure was part of a presentation made by Dr Ben Marner of Air Quality Consultants Ltd at the IAQM 'Monitoring Air Quality' conference on 30 April 2019, and is publicly available. Dr Marner, as a contractor of Highways England, had been provided with the data direct from Highways England.</p> <p>Figure X shows the way in which NOx concentrations decline away from the edge of the road (with results from the different transects all normalized to 100% at 23m) – these are the dots on the Figure. Highways England makes available a model to its contractors to allow them to predict NOx concentrations at different distances from roads and the solid line show this model superimposed on the measurements. Clearly the model provides a good fit to the</p>
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data. It is evident from this model, and the measurements, that even at 200 m from the road there is still a small increment of road NOx that will be above any local background.

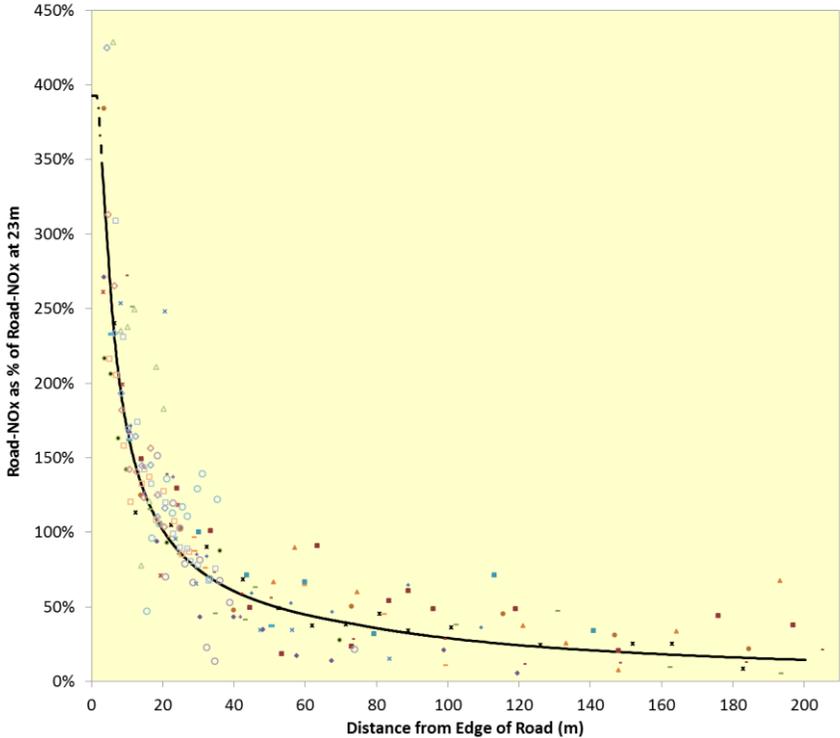


Figure X shows the road increments of NOx (normalised to 100% and 23 m) against distance from the edge of the road. The dots represent different transect studies. The solid line represents the Highways England model.

The shape of the decline with distance for ammonia in Figure 2 of REP5-049 is consistent with that for NOx in Figure X. This is not surprising, as Figure 3 of REP5-049 shows similar

			<p>declines with distance for both ammonia and nitrogen oxides.</p> <p>The IAQM in its May 2020 guidance summarises the pattern shown in Figure 2 of REP5-049 and Figure X (above) in para 5.3.6 on page 21, as "Air Pollution levels fall sharply within the first few tens of metres from a road before reducing more slowly with distance". There is no suggestion to ignore concentrations beyond 30m as suggested by HE.</p> <p>The evidence that has been presented here clearly supports the view set out by the RHS that concentrations of both ammonia and NOx decline with distance from a road. They will obviously tend towards background the further one is from the road, but will not reach it, even at 200m from the road (as is evident in Highways England's own work). As ammonia follows the same pattern of decline with distance, there is no basis for Highways England to discount the ammonia contribution to nitrogen deposition beyond 30 m and say that ammonia "would not affect deposition rates" 150-200m away (see REP8-022, section 3.3.1, page 29). Instead, the scientific evidence shows that both NOx and ammonia need to be accounted for in the nitrogen deposition calculations at all distances.</p>
5.	Construction		
9.	Land use, recreation and non-motorised		
12.	Socio-Economic impacts		
4.12.1	RHS	For question 5 (visitor routes used by visitors to RHS Wisley) of both the operational and construction phase	Question 5 should have stated 'From the west of Garden, via Wisley Lane (i.e. from the direction of Woking via Pryford Lock)' for the fifth route option.

		<p>additional surveys [pages 54 and 56 of REP6-024] should the compass point reference to 'east of the Garden' in the fifth route option not be the west?</p>	
<p>4.12.2</p>	<p>RHS and Applicant</p>	<p>At page 26 of REP8-054 the RHS states that in terms of its second attitudinal survey [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'.</p> <p>a) If the RHS's intention was as stated in the above quotation, then to avoid the around two thirds of the respondents travelling to and from RHS Wisley with origins other than those to the south of the Gardens and who would not experience 'the largest increase in journey times' [Page 27 of REP8-054] answering Question 8, then should Question 8 not have included a filter requiring this question only to be answered by respondents who identified options 3 and 4 in Question 5 as the route that they followed?</p>	<p>a) Question 8 did not need to include a filter requiring this question only to be answered by respondents who identified options 3 and 4 in Question 5 as the route that they followed.</p> <p>First, the responses to Q8 can be filtered by route within the outputs database. This permits an assessment of whether the sub-sample of respondents from the A3 South are likely to respond any differently to the whole sample (see response to part b below).</p> <p>Second, whilst Question 8 was designed to examine the worst-case impact of trips travelling from the A3 South, it was specifically examining how individuals are likely to respond to an increase of 6 minutes on a trip to the Garden and a further 2 minutes travelling from the Garden, as well as the additional distance. By asking all respondents, the RHS was able to gain a statistically more robust sample size to analyse behavioral responses to these increases in time and distance. This is a standard market research</p>

		<p>b) Is it reasonable for Hatch Regeneris to have drawn the conclusions that it has from section 3 onwards in its Report [REP8-054], given that in answering Question 8 around two thirds of the survey respondents might have thought they would experience a delay that they would not be subject to and would not know the number of visitors who might be subject to the largest increases in journey times and/or distances? Please justify your response.</p>	<p>technique where the objective is to understand the behavioral response to a specific set of criteria, regardless of whether those individuals will incur the impact in practice.</p> <p>b) It is entirely reasonable for Hatch Regeneris to have drawn the conclusion it has from section 3 onwards in its Report [REP8-054], for the reasons set out in our response to part a.</p> <p>Without prejudice to its position above, Hatch Regeneris have re-run the analysis on the basis of the sub-sample of respondents who stated they travel to the Garden from the A3 South route. The results are statistically identical for the sub-sample and so the conclusions presented within REP8-054 remain entirely valid.</p>
4.12.3	RHS and Applicant	<p>Please comment on whether the Questionnaire should have contained a question regarding real or perceived improvements in road safety as a result of the Proposed Development in order to assess attitudes of visitors towards any such improvements.</p>	<p>The Questionnaire did not need to include a question regarding real or perceived improvements in road safety as a result of the Proposed Development. Highways England's opinion that the DCO Scheme will improve safety is flawed (see REP5-053 - item 4). On this basis, the RHS do not consider a question on this matter to be necessary or appropriate. Even if this was not the case, it would not be practicable to ask a question of real or perceived improvements in road safety within the same, self-completion format. Respondents would need to fully understand the full implications of the current, DCO Scheme, and RHS Alternative Scheme designs, most likely requiring workshops.</p>

4.12.4	RHS and Applicant	<p>In Q8 to Q10 of the Hatch Regeneris Survey 2 Construction Phase questionnaire [REP6-024] respondents are specifically asked about perceived construction impacts. However, the Hatch Regeneris report also acknowledges in REP1-039 that construction of the RHS Alternative Scheme would give rise to a similar level of disruption of the local highway networks to the Proposed Development. Does the RHS still consider that both schemes would have similar impacts during their construction phases? If so, what do the RHS and the Applicant consider to be the socio-economic impacts that can be drawn from this, having particular regard to the RHS Alternative Scheme?</p>	<p>In general terms, the RHS consider that both schemes would have similar impacts during their construction phases, albeit the RHS Alternative Scheme offers the potential to further minimise the socio-economic impacts on the Garden.</p> <p>The RHS do not consider the additional components within the RHS Alternative Scheme (South-facing slips and the improved Wisley Lane slip connection to A3 Northbound) will result in any significant additional construction impacts and, indeed, if phased correctly, could provide improved access during the construction phase to assist in minimising the impacts on visitors to the Garden.</p> <p>The South-facing slips would be constructed almost entirely 'off-line' and so require minimal additional traffic management. If phased early in the programme, alongside the Wisley Lane bridge works, they would immediately provide enhanced access and avoid traffic from the A3 South having to either divert through Ripley or travel through the roadworks via the M25 Junction 10.</p> <p>The improved Wisley Lane slip connection to A3 Northbound, whilst not an 'off-line' enhancement, could again be phased alongside the works to deliver the Wisley Lane bridge. Much of the works could then, effectively, be completed 'off-line' and disruption to visitors to the Garden would be very similar to the DCO Scheme, and then immediately improved once the new slip could be opened.</p> <p>With the correct phasing of works, the RHS consider that the RHS Alternative Scheme would create less disruption for visitors to the Garden. However, our socio-economic analysis has taken a conservative approach and assumed the same impact.</p>
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4.12.5	RHS and Applicant	<p>The RHS has provided predictions of economic impact based on an estimated loss of visitors to Wisley as a result of the construction and operation of the Proposed development. How would such figures compare with the overall estimated benefits that may occur due to reductions in travel times for all users of this part of the A3/M25 as a result of the Proposed Development.</p>	<p>The RHS have estimated the overall economic cost impacts of the scheme upon visitors and operations at the Garden of between £60 million to £100 million. Highways England will be able to provide its latest estimated benefits to all users of the scheme – noting that this will be based upon the Strategic Highway model outputs that the RHS has demonstrated has limitations (REP6-024).</p> <p>Whilst the scale of the overall benefits from the DCO Scheme will clearly be more significant, what is equally important is that Highways England are not only required by the scheme objectives to ‘improve access to RHS Wisley’, but also to take due account the national importance of RHS Wisley, both in terms of its wider cultural significance and also in terms of its listed status.</p> <p>The RHS has previously indicated the important link between socio-economic matters and the conservation of the garden, which is a designated heritage asset of a very high order, a grade II* registered park and garden which includes a grade II listed building (see REP9-011). The designation entry expressly recognizes the garden’s educational and scientific function, and public access to the collection and the site is an integral part the asset’s significance. Any economic impacts to the Garden reducing income necessarily reduces the Society’s ability to conserve this important site and make the collections accessible to the public (through improved facilities as well as by maintaining and increasing visitor numbers). National planning policy requires decision makers to consider the impact of any development on the significance of a designated heritage asset, and any harm to its significance arising from direct impacts or impacts in its setting should be treated as weighted harm in the decision taking process – See National Policy Statement for National Networks (5.131). The NPS recognizes that harm to</p>
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			<p>'economic vitality' should be taken into account (5.130). Furthermore, the NPS emphasizes the finite nature of designated assets, which 'once lost cannot be replaced', adding that 'their loss has a cultural, environmental, economic and social impact'. As a matter of best practice, the potential harm to the viability of heritage assets through development in their setting is recognized in Historic England's best practice guidance on setting, GPA3 (2019), which comprises standard methodology for EIA work.</p> <p>As a matter of fact, the published ES into the scheme does not consider the economic impacts of the proposals on the heritage significance of any cultural heritage asset. On that basis alone, the RHS concludes that the ES is defective. As a consequence, the SoCG agreed between Historic England and Highways England does not cover this topic. To date the RHS can find no evidence of this matter ever having been considered formally by the promoter. Accordingly, and given the considerable importance and weight attaching to the conservation of a highly graded, designated asset, the RHS is pursuing further evidence to ensure the Examining Authority (ExA) fully understands the extent of the potential impact on the RHS' current and future operations. On this basis, the RHS intend to submit further evidence on this matter at Deadline 11.</p>
13.	Traffic, transport and road safety		
4.13.1	Applicant and RHS	Please provide your respective precise calculations for any journey time savings for visitors to RHS Wisley when the full 'RHS Alternative', ie the presence of south facing slip roads at the Ockham Park junction and a left turn from Wisley Lane, is compared with the	<p>The RHS does not have access to HE's traffic model and so calculations have been undertaken by reference to the difference in journey distance between respective routes and based on estimated average speeds of those routes.</p> <p>The estimated average speeds for the Existing Scenario reflect the existing slower conditions in the morning and evening peaks and speed improvements on the A3 and at</p>

		<p>submitted Proposed Development for the AM and PM peaks and the Interpeak periods as defined in the Applicant's Transport Assessment Report [APP-136]. In responding to this question, the ExA is expecting to be provided with:</p> <ul style="list-style-type: none"> • confirmation of which data set or sets that have been used; • a written summary of any assumptions made; • the step by step methodology for undertaking the calculations; and • the actual worked calculations. 	<p>J10 in the "with scheme" scenarios. The estimated average speeds also have regard to the lower speeds whilst negotiating junctions.</p> <p>For the morning and evening peaks, a lower speed assumption is adopted for the peak direction (ie slower northbound towards London in the AM peak and slower southbound away from London in the PM peak).</p> <p>Details of the estimated average speeds and the journey times which arise from these inputs are set out in the table in Appendix B, which deals with each route, by each scenario, by direction and then considers the Round Trip.</p> <p>As shown, when compared to the existing (DoMinimum) network and routes, the DCO Scheme would result in increases in all journey times, some significantly so. However, with the RHS Alternative Scheme every route would witness journey time savings.</p>
15.	Content of the draft Development Consent Order (dDCO)		
16.	Compulsory Acquisition		