Gatwick Airport Northern Runway Project

The Applicant's Response to the Examining Authority's Written Questions – Air Quality

Book 10

VERSION: 1.0

DATE: APRIL 2024

Application Document Ref: 10.16

PINS Reference Number: TR020005

APFP Regulations 5(2)(q) **Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009**

Table of Contents

1 Response to the Examining Authority's Written Questions – Air Quality 1

1 Response to the Examining Authority's Written Questions – Air Quality

The below table sets out the Applicant's response to the Examining Authority's Written Questions relating to Air Quality.

ExQ1	Question to:	Question:
AIR QUALITY		
AQ.1.1	The Applicant	**Air Quality Monitoring** Paragraph 8.5.15 of the Planning Statement [APP-245] states that "*a commitment is made to the continuation of current monitoring with new monitoring locations on the airport site and external to the airport are proposed to allow future monitoring of concentrations as set out in Table 13.9.1 in ES Chapter 13.*" What is the purpose of the monitoring and how would the data be used?
		In the context of the conclusions of the assessment in **Chapter 13: Air Quality** [APP-038], and the absence of any significant effects identified as a result of the Project, it was not considered necessary for this monitoring to be secured as a requirement to the DCO. However, in acknowledgment of the monitoring arrangements under the existing 2022 s106 Agreement, the Applicant is happy to support the understanding of air pollution effects more generally in the local area, and accordingly it is proposing to commit to continued monitoring obligations under the new s106 Agreement set out in Schedule 1, Air Quality in the **Draft Section 106 Agreement** [REP2-004]. The Applicant has provided the proposed monitoring site locations and a draft Air Quality Action Plan (AQAP) at Appendices 1 and 5 of the **Draft Section 106 Agreement** [REP2-004]. In summary, the monitoring will include funding for three monitoring sites to be managed by Reigate and Banstead Borough Council. The Applicant will manage two automatic reference standard monitors on the airport site, as well as four continuous indicative

		monitors. The monitoring will allow continuous collection of air quality concentrations in the vicinity of the airport to support the understanding of air pollution effects in the local area. The data will be used to compare against national standards, provide data to understand the sources of emissions, allow investigation of any changes in concentration in future and for transparency, the data will be reported by the airport.
AQ.1.2	The Applicant	**Delay to Proposed Ban on the Sale of New Petrol and Diesel Cars** Paragraph 8.5.17 of the Planning Statement [APP-245] notes that national efforts to reduce emissions and reduced vehicle emissions due to improvements in vehicle technology and uptake of electric vehicles would improve air quality. The ExA is unclear on what estimates have been used by the Applicant on the proportion of vehicle fleet that will be electric after 2030 and how those estimates may have been used in the air quality modelling. a) Can the Applicant provide this information and explain if there are any significant implications for the air quality modelling and assessment that arise from the UK Government's recent announcement of a delay to the ban on the sale of new petrol and diesel cars from 2030 to 2035? b) If the delay to the ban appears likely to give rise to a significant increase in the duration and/ or extent of adverse air quality effects: I. Can the Applicant please identify whether any additional air quality monitoring would be required as a consequence of the change to the ban?

		II. Can the Applicant please identify whether any changes to the design, extent and/ or duration of mitigation measures would be required? c) If changes to mitigation measures are proposed, the Applicant is asked to set the changes out in a summary table, describing the location and nature of the additional measures
		The Defra Emission Factor Toolkit version 11 (EFT v11) was used for the assessment of air quality in **ES Chapter 13: Air Quality** [APP-038]. EFT v11 includes the vehicle fleet composition data as detailed in Section 3.10, **ES Appendix 13.6.1: Air Quality Assessment Methodology** [APP-158]. **Appendix F** of the **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050], addresses how the air quality assessment has accounted for the topic of uncertainty in emissions over time. a) The Applicant provided an assessment of the delay in the ban of diesel and petrol vehicle sales in Appendix F, Section 1.3 of **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050]. In summary, it concluded that the EFT v11 had not incorporated the ban on the sale of new petrol and diesel cars and vans in 2030 and therefore the five year delay would have limited or no impact on the emission factors used in the ES. A review of the Transport Decarbonisation Plan[1] (TDP) and the Department for Transport (DfT) Transport Analysis Guidance (TAG) Data Book[2] was also undertaken to evidence that the proportions of EVs have been revised upwards since the Defra EFT v11 was released. The review provides the estimates of the EFT v11 EV proportions used in the assessment. The review showed that the uptake of EVs in the DfT datasets are greater than that assumed in the EFT. The TAG or TDP would result in reduced emissions compared to those

[1] Department for Transport (Defra) (2021) Decarbonising Transport: a better, greener Britain
[2] Department for Transport (2023) Transport Analysis Guidance data book, May 2023 v1.21

		assessed in the ES. Therefore, the uptake of EVs assumed in **ES Chapter 13: Air Quality** [APP-038] is considered conservative and the delay to the ban on the sale of new petrol and diesel cars from 2030 to 2035 will have no significant implications on the air quality assessment in the ES. b) Given the answer set out in (a), the delay to the ban is not likely to give rise to a change of significance. c) Given the answer set out in (a), no changes to mitigation measures are proposed.
AQ. 1.3	The Applicant	**Detailed Odour Assessment** Paragraph 8.5.22 of the Planning Statement [APP-245] states that a detailed odour assessment can be provided at the detailed design stage to demonstrate management of odour effects. Can the Applicant set out the basis on which a decision would be taken as to whether to provide such an assessment? What would be included in a 'detailed odour assessment'? Where is this set out and secured through the DCO? If not, why not?
		It should be noted that Paragraph 8.5.22 of the **Planning Statement** [APP-245] is referring to the replacement CARE facility and the proposed water treatment works. As detailed in Paragraph 8.5.22, the proposed water treatment works are not considered to be significant in relation to odour as it would not handle highly odorous of offensive contaminants. As detailed in Section 4 of the **Change Application Report** [AS-139], the Applicant has

		put forward a change to the DCO Application to remove the proposed biomass boilers and to change in the purpose of the CARE facility to become a waste sorting facility only. **Basis for decision** – The facilities which could result in odour from the processes would be subject to environmental permits. Best practice methods following industry guidelines would be followed to scope the nature and level of detail of environmental assessment required for the environmental permit. As odour is a known risk for these types of facilities, it would be included in the planning and permitting requirements for the environmental assessment. **What would be included in the assessment** – The risk of effects would be scoped to determine a proportionate assessment following industry best practice guidance (e.g. IAQM Guidance on the assessment of odour for planning v1.1, Environment Agency 'H4 odour management' for environmental permitting). This would determine the level of detail required to inform recommended mitigation and effects, this could include source pathway receptor assessment or dispersion modelling. **Where is this secured** – The environmental permitting processes for these sites, dictated by the Environment Agency, will secure the assessment to be undertaken and any required mitigation.
AQ.1.4	The Applicant	**Air Quality Management Areas** With reference to paragraph 5.43 of the ANPS, does the Applicant consider that the impact of the Proposed Development would be sufficient to bring about the need for new Air Quality Management Areas (AQMA) or change the size of the existing AQMAs? If a need is identified, can the Applicant provide summary information in ES Chapter 13 [APP-038], including the number of additional people located in the extended area compared with the numbers in the existing area(s) in the

		reasonable worst case operating scenario? (There are further questions below on matters of detail).
		The air quality assessment in **ES Chapter 13: Air Quality** [APP-038] has demonstrated that the Project will not result in any new exceedances of the national air quality standards, as such the local authority would not be required to consider extending any existing AQMA or creating new AQMA. The impact at the AQMAs in future years have been assessed with the results presented in Section 13.10 of **ES Chapter 13: Air Quality** [APP-038] and within **ES Appendix 13.9.1 Air Quality Results Tables and Figures** [APP-162 - APP-167]. The air quality impacts at receptors including those within AQMAs demonstrate that there are forecast to be no new exceedances of the air quality standards with the Project. At locations of predicted exceedances, the future baseline concentrations without the Project also exceed the air quality standard. For context, there are two AQMAs declared for exceedances of the annual mean NO_2 air quality standard within the 11 km by 10 km domain centered on the Airport, Horley AQMA and Hazelwick AQMA. Monitoring within these AQMAs demonstrate that annual mean NO_2 concentrations have consistently been below the air quality standards since 2015 as reported in Section 13.7 of **ES Chapter 13: Air Quality** [APP-038]. The air quality assessment has demonstrated that predicted NO_2 concentrations at all receptors in the two AQMAs are below the air quality standard with and without the Project and would therefore not create exceedances of the air quality standard in these areas.
AQ.1.5	The Applicant	**ANPS Mitigation** The ANPS mitigation section (5.35 to 5.41) is omitted from Table 13.2.4 of ES Chapter 13 [APP-038]. Can the Applicant confirm which of the measures identified, including those listed under 5.39, are committed to by

		the Applicant and where are these secured in the DCO? For those that are not committed to, can the Applicant explain its position?
		ES Chapter 13: Air Quality [APP-038] has provided an assessment of air quality impacts from all related sources (road vehicles, aircraft and airport sources) following the methodology agreed with the local authorities. A robust assessment of the construction and operational periods presenting reasonable worst case effects has been provided in line with best practice guidance and available data. The assessment concludes that the impact of the Proposed Development would not be significant. Notwithstanding this, the Applicant has provided a draft Air Quality Action Plan (AQAP) at Appendix 5 of the **Draft Section 106 Agreement** [REP2-004] which details the mitigation proposed. The actions taken to reduce emissions would be secured in the following documents, should the DCO be granted: • **The Carbon Action Plan (CAP)** [APP-091] secured by Requirement 21 of the Draft DCO (Doc Ref. 2.1): • **The Surface Access Commitments (SAC)** [APP-090] secured by Requirement 20 of the Draft DCO (Doc Ref. 2.1); • **The Code of Construction Practice** [REP1-021] secured by Requirement 7 of the Draft DCO (Doc Ref. 2.1); • **The Outline Construction Traffic Management Plan** [APP-085] secured by Requirement 12 of the Draft DCO (Doc Ref. 2.1); • **The Outline Construction Workforce Travel Plan** [APP-084] secured by Recruitment 13 of the Draft DCO (Doc Ref. 2.1); and

		• **Deadline 2 Submission – 10.11 Draft Section 106 Agreement** [REP2-004] The ANPS example mitigation measures (paragraph 5.39) have been considered within the above documents. The commitments within the CAP (e.g., specific to Airport Buildings and Ground Operations, to achieve Net Zero for the Applicant's Scope 1 and 2 GHG emissions by 2030, and zero emission by 2040) and SAC (e.g. the sustainable transport mode share commitments for passenger and staff journeys) will require emission reductions from a wide range of sources across the airport operations and surface access journeys to and from the airport. All measures from those included in the ANPS example have been considered within the toolkit of measures in the CAP and SAC, other than consideration of 'physical barriers to trap or better disperse emissions and speed control on roads', which are not considered as there are no localised air quality impacts to mitigate, which would benefit from such an action. As noted in those documents, in general terms, it is the absolute outcomes which are committed to, rather than the individual measures themselves, which are purposely not prescriptive to allow the Applicant flexibility to select the most effective combination of them (or others) based on circumstances and knowledge that exist at the time (particularly in respect of the fast-evolving technological and regulatory landscape in terms of those measures informing the CAP).
AQ.1.6	The Applicant	**Code of Construction Practice – Air Quality** Can the Applicant add air quality, dust and odour management to the list of topic specific plans identified as annexes of the CoCP [APP-083 to APP-087]?
		Management measures to mitigate air quality, dust and odour impacts are addressed within the body of the **Code**

		of Construction Practice (CoCP) [REP1-021]. The CoCP (para 2.2.7) requires Construction Dust Management Plans (CDMPs) to be prepared in accordance with the measures within the CoCP. CDMPs will be prepared prior to the construction of each planned work package for the construction of the Project. The mitigation measures within the CDMPs will be confirmed based on the level of dust risk associated with each work package, taking into account the magnitude of work and cumulative effects in relation to works across the site as a whole that could be occurring in parallel. The level of risk will be assessed in line with STEP 2 of the IAQM guidance as provided in Section 2 of the **ES Appendix 13.6.1 Air Quality Assessment Methodology** [APP-158]. The mitigation measures will be in accordance with the measures outlined in the **CoCP** [REP1-021] and best practice. Measures for odour management and for managing emissions from vehicles and machinery are set out in Section 5.8 of the **CoCP** [REP1-021] and are based on best practice industry guidance.
AQ.1.7	The Applicant	**Relevant Representation - Bernard Fisher** The Relevant Representation (RR) of Bernard Fisher [RR-0458] raises several detailed points in relation to the Applicant's submission on air quality. Can the Applicant provide responses to these?
		The Applicant has responded to the Relevant Representation of Bernard Fisher at Section 10 of **The Applicant's Response to Written Representations** (Doc Ref. 10.14) submitted at Deadline 3.

AQ.1.8	The Applicant	**Relevant Representation – National Highways** National Highways (NH) in its RR [RR-3222] raises a query regarding which emission factor toolkit has been used in the assessment. Can the Applicant respond to this?
		The road traffic emissions were obtained from the Defra Emissions Factor Toolkit (EFT) version 11[3] as set out in Paragraph 13.7.16 of **ES Chapter 13: Air Quality** [APP-038]. This was the most recently available toolkit at the time of the assessment. Section 1.4 of **Appendix F** of **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050] addresses the implications of EFT version 12, released following the submission of the DCO Application.
AQ.1.9	The Applicant	**Air Quality - Study Area** ES Chapter 13, paragraph 13.5.56 [APP-038] states that the operational study area is the 11km x 10km study area. However, paragraph 13.5.5 states that the wider study area includes the Affected Road Network (ARN) along which there is potential for impacts during operation. Can the Applicant confirm whether the ARN is assessed for the operational phases and if not, provide justification?

[3] Department for Environment Food and Rural Affairs (Defra) (2021) Emissions Factors Toolkit (EFT) (Version 11.0)

		The Applicant can confirm that the ARN is assessed for the operational phases. Paragraphs 13.5.4 to 13.5.10 of **ES Chapter 13: Air Quality** [APP-038] sets out the construction and operational phase study areas. The study area assessed for construction traffic and the operational phases includes the 11 km by 10 km domain plus the modelled Affected Road Network (ARN) outside this area. Figure 4.1.1 Modelled Road Network of **Air Quality Figures – Part 2** [REP1-018] presents the ARN network for the wider study area.
AQ.1.10	The Applicant	**Air Quality – Cumulative Effects** Can the Applicant explain how an assessment of construction and operation cumulatively in 2029 captures a worst-case scenario noting that ES Chapter 13, Tables 13.10.5 and 13.10.6 [APP-038] demonstrate an increase in operational emissions that could act cumulatively with construction emissions?
		The 2029 Highways (Surface Access) Construction scenario represents years 2029 to 2032, during which there will be an overlap with the operation of the Project. The Construction scenario assessed is a combined scenario considering the cumulative contribution from both construction and operational traffic during this period to represent a realistic worst-case assessment. **Appendix D** of **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050] addresses Relevant Representation queries on the modelling scenarios included in the **ES Chapter 13: Air Quality** [APP-038], including further detail on cumulative construction and operation impacts.
AQ.1.11	The	**Slow Fleet Transition**

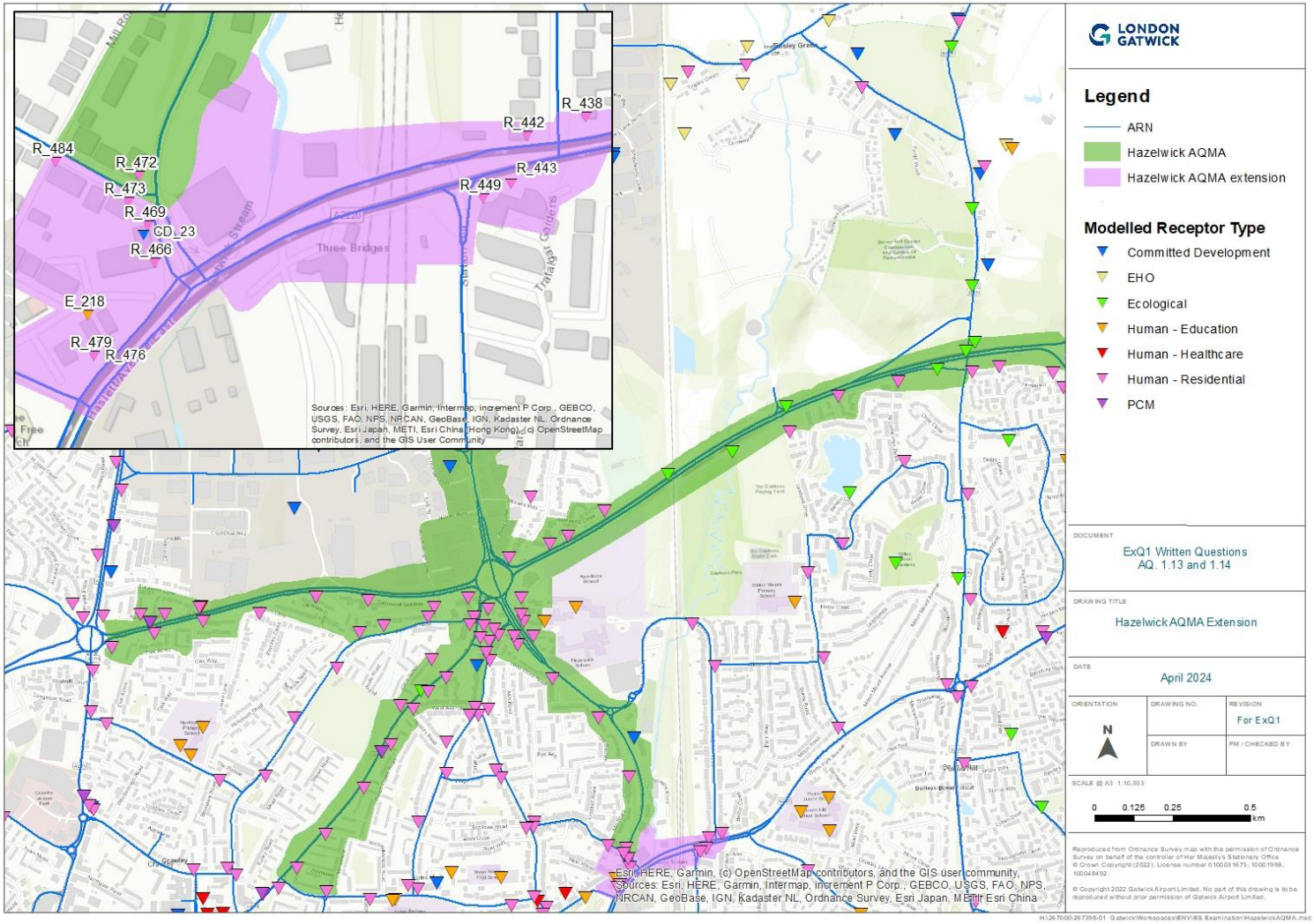
	Applicant	ES Chapter 13, paragraph 13.5.26 [APP-038] does not include 2047 in the slow fleet transition on the assumption that all aircraft will be new generation. ES Appendix 13.9.2, paragraph 3.1.1 [APP-168] states that this is based on assumptions around airlines' fleet procurement programmes and business models. However, these assumptions are not explained, ie the difference between the engine types and how they are anticipated to change over time. Can the Applicant provide further explanation on how and to what degree the engine type is anticipated to transition to the new generation of engines by 2047?
		The forecast proportions of next generation aircraft in the fleet over time in the 'central case' (most likely rate of fleet transition) is provided in Section A1.3 of **Annex 1** to **ES Appendix 4.3.1 Forecast Data Book** [APP-075]. Detailed fleet information, including how it is anticipated to change from 2029 to 2047 is provided in Table A1.3.2. The forecast proportions in Table A1.3.1 show 100% next generation aircraft in the 2038 and 2047 scenarios in both the base case and Northern Runway case. The proportions of next generation forecast in the Slow Fleet Transition scenarios are provided in **Annex 3**, which shows proportion of next generation aircraft being 82% of the fleet in 2038, but reaching 100% in 2047, matching the 'central case'. Therefore, by 2047, the fleet mix in terms of next generation aircraft in the 'central case' and the Slow Fleet Transition case will be aligned. An assessment of the 2047 central case was undertaken and is presented in **ES Chapter 13: Air Quality** [APP-038] and therefore an air quality assessment of the 2047 Slow Fleet Transition sensitivity scenario was not considered necessary, as it would be assumed to be the same as the central case already assessed. **ES Appendix 4.3.1 Forecast Data Book** [APP-075] sets out the consultation and engagement which informed the forecasts used including consideration of the Jet Zero Strategy[4]. The Jet Zero Strategy sets out UK

[4] Department for Transport (2022) Jet Zero Strategy: delivering net zero aviation by 2050.

		Government's framework and plan for achieving net zero aviation in the UK by 2050. The strategy considers improvements in aircraft fleet, considering sustainable aviation fuel and introductions of zero emission aircraft.
AQ.1.12	The Applicant	**Effects due to Modelled Traffic Noise** ES Chapter 13, paragraphs 13.10.24 and 13.10.51 [APP-038] report locations where there are predicted exceedances of the $PM_{2.5}$ objective in the do minimum and do something scenarios for 2024 leading to a moderate adverse effect (for 2024 R_117 and R_147 and for 2029 R_147). The ES states that the Proposed Development is unlikely to change traffic in those areas and changes are attributed to 'modelled traffic noise' which is explained in Transport Assessment (TA) Annex E [APP-263]. However, this Annex does not identify Sutton Common Road (R_147) as a receptor that is subject to model noise in 2024 or 2029. Can the Applicant explain why the moderate adverse effects at R_147 in 2024 are not considered significant?
		The Applicant addresses the change in concentration at Sutton Common Road (R_147) receptor at Section 3 of **Appendix C** of **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050]. In summary, at R_147 an anomaly in the emissions data was identified within the construction scenarios. The traffic data represent an overall decrease in AADT and the closest receptor H_166 demonstrates that the concentration change at R_147 Sutton Common Road is likely to be 0.1 $\mu g/m^3$ for NO_2, PM_{10} and $PM_{2.5}$ corresponding to no significant effects.

AQ.1.13	The Applicant	**Effects on the Hazelwick AQMA** ES Chapter 13, paragraph 13.7.2 [APP-038] identifies Horley AQMA and Hazelwick AQMA as the only two AQMAs located within the 10km x 11km study area. Hazelwick extension is stated to be the area where the Three Bridges are, which is an additional area onto the southeastern arm of the current Hazelwick AQMA. These two AQMAs are located in the Air Quality Figures Part 1 on Figure 13.1.11 [APP-066] however, it is not clear whether the extension is included in this Figure. Can the Applicant confirm the location and extent of the Hazelwick AQMA extension in relation to the Proposed Development either in the existing documentation or provide an appropriate Figure?
		The Hazelwick Air Quality Management Area (AQMA) and extension is located approximately 3km south of the Order Limits. The original AQMA was declared on 09/07/2015 for exceedances of the annual mean NO_2 air quality standard. The extension of Hazelwick AQMA was declared on 11/03/2022. **Figure 1**, below, has been provided below showing the location of the original AQMA (in green) and the extension (in purple). The assessment in **ES Chapter 13: Air Quality** [APP-038] included the extension area.

Figure 1 Location of the Hazelwick AQMA and extension



AQ.1.14	The Applicant	**Effects on the Hazelwick AQMA** ES Chapter 13 paragraph 13.7.2 [APP-038] identifies that the Hazelwick AQMA extension is within the 10km x 11km study area. However, the modelled figures are not referenced with the assessment. For example, ES Chapter 13, paragraph 13.10.21 states that the highest annual mean NO_2 concentration at Hazelwick AQMA is anticipated at receptor R_538 as 31.8 µg/m^3 as shown in the Air Quality Modelling Results in ES Appendix 13.9.1 Part 2 [APP-163]. However, receptor R_442 shows an anticipated NO_2 concentration at Hazelwick AQMA as 34.8 µg/m^3. Can the Applicant either explain why the extension is not included in the discussion or update the ES Chapter and assessment to include the extension modelling?
		The extension of the Hazelwick AQMA is considered in Paragraph 13.7.2 of **ES Chapter 13: Air Quality** [APP-038]. A figure showing the location of the extension and receptors considered within the ES assessment is provided above in AQ.1.13. Results for the 12 modelled receptors within Hazelwick AQMA extension are reported in **ES Appendix 13.9.1: Air Quality Results Tables and Figures Part 4 - Part 6** [APP-165, APP-166, APP-167], identifiable by '*Hazelwick AQMA (extension)*' within all results tables. The results of the original AQMA are reported separately, within which the highest anticipated annual mean NO_2 concentration for the 2024 construction scenario is 31.8 µg/m^3 at receptor R_538, as reported in Paragraph 13.10.21 of **ES Chapter 13: Air Quality** [APP-038]. Including the extension, R_442, has the highest anticipated annual mean NO_2 concentration of 34.8 µg/m^3 for the 2024 construction scenario, as reported in Table 3.1.1 of **ES Appendix 13.9.1 Air Quality Results Tables and Figures – Part 2** [APP-163]. This does not change the conclusions of the assessment as the receptors in the

		extension, including R_442, show negligible impacts as a result of the Project.
AQ.1.15	The Applicant	**Modelling – Reduction in PM_{10} and NOx Pollutants** ES Chapter 13, Table 13.10.1 [APP-038] sets out the modelling results for construction year 2024 with the project for NOx, PM_{10} and $PM_{2.5}$. The change in emissions is compared to the 2024 construction period without the Project, as shown in ES Table 13.7.3. This demonstrates a reduction in emissions of PM_{10} and NOx with the Project at peak construction year in 2024 without explanation as to why there is such an improvement considering the anticipated increase in construction activity. Can the Applicant explain the justification as to why the modelling demonstrates a reduction in PM_{10} and NOx pollutants?
		Table 13.10.1 of **ES Chapter 13: Air Quality** [APP-038] shows a small reduction in NO_x emissions (-1.9 t/yr) and increase in emissions for PM_{10} (1.0 t/yr) and $PM_{2.5}$ (0.6 t/yr) for the 2024 construction period. The changes in emissions are due to changes in road traffic between the Without and With Project scenarios. The reduction in NO_x emissions can be explained by a slight decrease in road traffic across the modelled network. The small increases in PM emission can be attributed to changes in fleet composition between with and without Project scenarios. As there is a slightly greater proportion of heavy goods vehicles with the Project, the PM emissions show a small increase as HGVs have higher PM exhaust emissions than light duty vehicles and have more brake and tyre wear due to their heavier weight. The reductions in traffic have been reviewed by the transport consultants and the small changes in traffic flows are considered reasonable in the strategic model with small changes in input assumptions (HGV construction

		vehicles and workers). Whilst the analysis indicates small reductions in emissions in some locations, the scale is within the tolerances of the model and should not be considered as an impact of any significance. Further detail on AADT information can be found in the **Transport Assessment - Annex B Strategic Transport Modelling Report** [APP-260]. Figure 200 shows that there are small reductions in AADT through the Gatwick corridor and on the M25, with small increases elsewhere. These AADT figures are the product of micro changes in flows at the hourly level. The subtle changes to the model to generate the Airfield Construction traffic (the employee demand and the HGVs) will lead to small changes in traffic volumes on links with localised rerouting across the network in the assignment.
AQ.1.16	The Applicant	**Changes in $PM_{2.5}$ Emissions** Can the Applicant either update or explain why ES Chapter 13, Table 13.10.1 [APP-038] does not reflect the change in $PM_{2.5}$ emissions when compared with ES Table 13.7.3. ES Table 13.7.3 shows total airport related emissions as 29(t/yr) and ES Table 13.10.1 shows 31(t/yr) but the change is stated to be 0?
		For Table 13.7.3 which presents the pollutant emissions for the 2024 construction period (Without Project), the Applicant confirms that the emissions reported are correct, however there is an error in the Total $PM_{2.5}$ emissions reported, as these do not reflect the sum of the sources. The Applicant has revised the 'Total (all sources)' and 'Total (airport-related)' $PM_{2.5}$ emissions in an updated version of **ES Chapter 13: Air Quality** (Doc Ref. 5.1 v2) submitted at Deadline 3. The $PM_{2.5}$ emissions and change presented in Table 13.10.1 of **ES Chapter 13: Air Quality** [APP-038] for the 2024 construction scenario (With Project) are accurate. Therefore, there is no impact to the air quality assessment

		or conclusions.
AQ.1.17	The Applicant	**Extent of Changes in Emissions** ES Chapter 13, paragraph 13.10.25 [APP-038] states that the largest change in pollutants during construction in the 2024 scenario is at receptor R_147. This is located 12km north of the M25 and is concluded to experience a moderate adverse effect. Can the Applicant further explain why the largest change would take place up to 12km from the M25 rather than in local proximity to the construction activity?
		The Applicant addresses the change in concentration at Sutton Common Road (R_147) receptor at Section 3 of **Appendix C** of **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050]. Section 4 of **Appendix C** [REP1-050] provides a summary of the highest predicted concentration and greatest change, alongside the reasoning for each assessment scenario. The largest change in 2024 is predicted to occur at receptor R_600, located in Horley close to the A23 (London Road) and the change is due to airport activity.
AQ.1.18	The Applicant	**Cross-referencing with Odour Management and Financial Costs** ES Chapter 10 [APP-035] and Chapter 17 [APP-042] are cross referenced in Chapter 13 paragraphs 13.12.6 and 13.12.7 [APP-038] where odour management and the financial cost of air pollution are discussed respectively.

		Can the Applicant signpost exactly where in these Chapters these topics are discussed and explain how/ if they influence the assessment in ES Chapter 13?
		Inter-related effects on odour impacts during groundworks are referred to in **ES Chapter 10: Geology and Ground Conditions** [APP-035], with paragraphs 10.6.3 to 10.6.38 on the Baseline Environment and Table 10.6.3, highlighting historical activity which may give rise to odour risk. **ES Appendix 5.3.2 Code of Construction Practice** [REP1-021] includes measures to mitigate odour risks. The financial costs have been presented in Table 7.2.1 of **Needs Case Appendix 1 – National Economic Impact Assessment** [APP-251]. The cross references are for information to demonstrate where other air quality related aspects are also being considered within the DCO Application. The assessment of air quality does not rely on information from Chapter 10 or Chapter 17, therefore they do not influence the conclusions provided in **Chapter 13: Air Quality** [APP-038].
AQ.1.19	The Applicant	**Mitigation – Dispersal of Emissions** ES Chapter 13, paragraph 13.5.55 [APP-038] states that mitigation measures for the concrete batching plant and non-road mobile machinery may include increasing the release height of emissions for sufficient dispersion and that this is set out in the CoCP. However, there appears to be no such wording in the CoCP. Can the Applicant explain where such mitigation measures are secured through the DCO?
		Section 5.8 of **ES Appendix 5.3.2 Code of Construction Practice (CoCP)** [REP1-021] includes measures to

		control and minimise emissions from non-road mobile machinery (NRMM). The reference in paragraph 13.5.5 of **ES Chapter 13: Air Quality** [APP-038] that *'increasing the release height of emissions for sufficient dispersion (if necessary)'* is deliberately not framed as a prescriptive requirement. This is because the NRMM assessment has been based on a number of conservative assumptions, as detailed in Section 13.12 of **ES Appendix 13.4.1** [APP-158] and the assessment demonstrates that there are no significant impacts predicted. The risk of impacts from NRMM is mitigated under the secured measures contained within Section 5.8 of the **CoCP** [REP1-021], '*site preparation/ maintenance'* where it is stated to *'Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.'* The detailed design process (post-DCO) would provide an opportunity to review the need for additional measures, if considered necessary, and any requirement for Environmental Permits for combustion plant if necessary as a result of design information, plans and site layout details. This may include, for example, the concrete batching plant or other NRMM requiring Environmental Permits. Release height of emissions would be considered and assessed as part of an Environmental Permit application to satisfy the regulator, the Environment Agency. The **CoCP** [REP1-021] secures monitoring following best practice guidance. Monitoring will be used to assess if the agreed mitigation measures are being applied effectively. This will be described in the Construction Dust Management Plan, which will be developed and secured in accordance with the **CoCP** [REP1-021].
AQ.1.20	The Applicant	**Monitoring of Emissions** ES Chapter 13, paragraphs 13.9.7 to 13.9.19 [APP-038] identify that NO_2, PM_{10} and $PM_{2.5}$ pollutants will be

		monitored to identify peaks in concentrations and trace that back to either airport or non-airport activity. It is not clear from the information provided as to whether this includes ammonia. Can the Applicant to justify its response and provide any evidence of agreement of this approach with relevant statutory bodies?
		Monitoring of ammonia is not proposed to be carried out in the vicinity of the Airport. Ammonia, as a pollutant alone and its contribution to nitrogen deposition have been assessed in **ES Chapter 9: Ecology and Nature Conservation** [APP-034]. No significant impacts have been predicted in relation to air quality impacts. The method of assessment and conclusions have been agreed with Natural England and the SOCG will be updated to reflect this position and will be submitted to the Planning Inspectorate at Deadline 5. As such, there is no requirement to monitor ammonia concentrations at the airport or any ecological sites.
AQ.1.21	The Applicant	**Relevant Representation - National Highways** NH in its RR [RR-3222] states that there is a limitation to the use of using 0.2m dispersion site roughness and that some sensitive receptor locations may not be suited to this roughness factor. This may lead to underestimation of the turbulence on the ARN. Can the Applicant justify the use of the 0.2m site roughness factor and how this can be considered for the ARN as a reasonable worst case for assessing impacts to air quality?

		The Applicant acknowledges that given the extent of the modelling domain, the topography and land-use do vary between the receptors which have been considered and assessed, which will affect the dispersion of pollutants in the real-world. As set out in the response to the Relevant Representation from National Highways [RR-3222] and the **Statement of Common Ground between Gatwick Airport and National Highways** [REP1-036], the use of a single surface roughness (SR) value of 0.2m was used for consistency, mirroring the approaches taken in previous Gatwick business as usual emissions inventories and air quality modelling studies undertaken for 2002/3, 2005/2006, 2010 and 2015. The 2005/6 study acknowledged that an '*an approximate representative value of roughness length for modelling the dispersion of sources on, or close to the airport is expected to lie in the range 0.2 m to 0.5m: in the 2002/3 modelling study a value of 0.2 m was chosen. The predicted ground-level concentration from low-level sources decreases with increasing roughness length. Although 0.2 m is at the lower end of the plausible range of values (giving concentrations that are more likely to be overestimates than underestimates), this value was retained for the current study'.* Following the same approach, a SR value of 0.2 m was chosen for this assessment. Furthermore, the modelling methodology included in the **ES Chapter 13: Air Quality** [APP-038] was developed and discussed through extensive engagement with local councils between August 2019 and February 2023, as set out in Table 13.4.4 of Chapter 13. This included seven Topic Working Group meetings with local councils and technical support (AECOM), discussing all aspects of the assessment methodology. A disagreement with the SR approach was not noted. As part of the methodology and scope development, together with the post-assessment stage, the Applicant's Project team review other DCO Application documents on the Planning Inspectorate website. Of particular relevance to this study based on the scales, geography or recent time periods, the Applicant's Project team

		reviewed the Air Quality Assessments submitted as part of the DCO applications for a large number of schemes, including (but not limited to) the M25 J10 Wisley Junction (PINS reference TR010030), M25 J28 Improvements (PINS reference TR010029), A66 Northern Trans-Pennine Project PINS reference TR010062) and Lower Thames Crossing (PINS reference TR010032), all submitted by National Highways. It is noted that each of the associated assessments submitted as part of the DCO Applications above were based on the use of a single SR value for the modelling domain, rather than the use of a variable SR, in-line with the approach taken by Gatwick Airport. In relation to the potential implications of the use of variable SR rather than a single number for the modelling domain, it is difficult to draw exact comparisons between projects due to differences in the environment and model set up. In simplistic terms, CERC (the model developers of ADMS software) suggest that the greater the surface roughness value used in a model (for example in an urban area), the greater the level of turbulence and mixing, which has the effect of reducing pollutant concentrations, rather than increasing pollutant concentrations. This is further documented in the published research paper by the University of Birmingham[5], which summarises: - *"The model results suggest that reducing surface roughness in a city centre can increase ground-level pollutant concentrations, both locally in the area of reduced roughness and downwind of that area…. We expect the results from this study to be relevant for all atmospheric dispersion models with urban-surface parameterisations based on roughness".* The maximum impact from the Project is in the area of Horley. Looking in isolation, the model SR for this area may be between 0.2 - 0.5 m, representing open suburbia (increased turbulence from urban conurbation). Based on knowledge of how the models perform, supported by the University of Birmingham research paper above, it is

[5] Spatially-varying surface roughness and ground-level air quality in an operational dispersion mode, M.J. Barnes et, al. (2013) available at: https://www.sciencedirect.com/science/article/pii/S026974911300537X

		expected that any increase in model SR from 0.2 m to 0.5 m would have the effect of reducing the predicted pollutant concentrations. The assessment provided in the ES therefore presents reasonable worst-case effects and despite this concludes that the impact of the Project would not be significant. Therefore, it is concluded that the Gatwick AQA submitted as part of the DCO Application is robust, having actively engaged with stakeholders throughout the Project's development and is consistent with other major DCOs approaches, including those submitted by NH. Having a variable model SR, whereby some areas would see an increased model SR value at locations close to the NH strategic network is expected to have the effect of reducing pollutant concentrations and reported potential impacts at these locations, rather than increasing pollutant concentrations impacts. Therefore, the Gatwick AQA submitted as part of the DCO Application is considered to present a conservative worst-case assessment.
AQ.1.22	The Applicant	**Effect on Six Compliance Links** Can the Applicant provide evidence that the Proposed Development will not exacerbate pollutant levels along the NH six compliance links surrounding the proposed site boundary; A23, A264, A2220, A2004, A2011 and A2219 or lead to an exceedance of the EU Limit Value of 40µg/m3 as an annual mean for NO_2 along these links?
		A summary table (**Table 1**) has been provided below to demonstrate that for all roads listed, the Project does not create an exceedance of the Limit Value or delay compliance in any zone or agglomeration. The table provides a row for each of the roads listed in the question above and gives information from the modelling to show the highest predicted NO_2 annual mean concentration at each link location and the largest change as a result of the Project. Traffic data for each road and the change as a result of the Project is also presented for 2032 operational

year, the scenario with the maximum predicted change.

Further information in relation to National Highways' queries has been provided in paragraph 2.1.2 in **Appendix C** of **Supporting Air Quality Technical Notes to Statements of Common Ground** [REP1-050].

Table 1 Summary table

Road name	Worst case compliance receptor along road	Maximum modelled Annual Mean NO_2 Concentration ($\mu g/m^3$)*	Maximum modelled change from DM to DS ($\mu g/m^3$)**	DM 2032 traffic flow on link adjacent to compliance receptor (AADT)	DS 2032 traffic flow on link adjacent to compliance receptor (AADT)	Change in traffic flow as a result of the Project (DM to DS AADT)
A23	P_164	28.5	0.6	103,350	115,039	11,689
A264	P_30	18.2	0.2	29,678	29,991	313
A2220	P_28	17.3	0.1	14,660	14,754	94
A2004	P_25	18.1	<0.1	14,076	13,958	-118
A2011	P_32	18.9	0.1	24,562	24,639	77
A2219	P_17	15.5	0.1	7533	7522	-11^

*from DS2029 operational modelled scenario

**from 2032 operational modelled scenario

^ It is noted that P_17 is predicted to experience a change of 0.1µg/m^3 increase in NO_2 from DM to DS 2029, but a decrease in traffic flow of 11 AADT. This is caused by surrounding roads, Haslett Avenue West and Station Road approximately 48m north and 90m east respectively of P_17, experiencing a predicted increase in AADT collectively.