Luton Rising
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London Luton Airport Expansion

Planning Inspectorate Scheme Ref: TR020001

Volume 8 Additional Submissions (Examination)

8.67 Applicant's response to Written Questions - Air Quality and Odour

Infrastructure Planning (Examination Procedure) Rules 2010

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The Planning Act 2008

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London Luton Airport Expansion Development Consent Order 202x

8.67 APPLICANT'S RESPONSE TO WRITTEN QUESTIONS – AIR QUALITY AND ODOUR

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1 RESPONSE TO EXAMINING AUTHORITY WRITTEN QUESTIONS (AIR QUALITY AND ODOUR)

Table 1.1: Responses to the Examining Authority's Written Questions (Air Quality and Odour)

PINS ID	Question / Response
AQ.1.1	**Question:** Post-covid air quality data trends Provide air quality monitoring status reports for 2023, where not already provided.
	Response: Monitoring status reports are not likely to be ready yet for 2023 data, however the Applicant notes Luton Borough Council have shared the latest Annual Status Report (ASR) with the Examining Authority. As noted in the Air Quality Issue Specific Hearing, air quality data showed reductions during covid as would be expected, concentrations have increased again in 2022 but not to pre-pandemic levels. There are no implications for the assessment carried out for the ES.
AQ.1.2	**Question:** Bias Adjustment It is noted that Luton Borough Council's air quality monitoring status report for 2023 includes details of bias adjustment factors for air quality monitoring locations. For 2021 and 2022, London Luton Airport Operations Limited monitoring locations use a bias adjustment factor of 0.78 and 0.76 respectively. LLAOL data informs the ES assessment of air quality effects. Explain what the implications, if any, of applying a lower than national average bias adjustment factor to these monitoring results are for the air quality model and the conclusions of the assessment.
	Response: The use of local bias adjustment factors used in the 2022 and 2021 monitoring data have no implications on the conclusion of the air quality monitoring results, as a 2019 baseline has been used. A local bias adjustment factor for 2019 diffusion tube monitoring carried out by Luton Borough Council was used for verification. As no co-location study was carried out by London Luton Airport Operations Limited in 2020, bias adjustment factors from the national database were used. It is the local authority's responsibility to determine if a local bias adjustment factor or a national factor are most appropriate. As outlined in the Local Air Quality Management Technical Guidance (LAQM TG.22) Box 7-13 (Ref 1) it is appropriate to adjust the tube results based on co-location with a high-quality roadside chemiluminescence site managed to Automatic Urban and Rural Network (AURN) standards which is the case in Luton. The use of the total adjusted concentrations for model verification is best practice and would not affect the conclusions of the ES.
AQ.1.3	**Question:** Construction traffic – routeing (also raised under noise and vibration) The Outline Construction Traffic Management Plan (CTMP) [APP-130, Appendix 18.3] explains that whilst the majority of traffic would use the M1/ A1081 to access the site, some use of the A602/ A505 corridor is anticipated. Explain what allowance has been included in the air quality chapter to account for these movements and draw on evidence from distribution of construction traffic for Project Curium works to demonstrate why this pattern of movements provides a robust assumption for the Proposed Development. You may wish to link the answer to this question with the answer to NO.1.4
	Response: The Primary Route Network (PRN) stated in the **Outline Construction Traffic Management Plan (CTMP) [APP-130]** is the M1/A1081 route. No allowance has been explicitly included in the air quality assessment to account for any potential construction traffic along the A602/A505 corridor given that no material use of this corridor was expected. The **CTMP [APP-130]** states that the principal consideration when identifying designated routes will be the minimisation of travel along any road that does not form part of the PRN. Section 6 of the **CTMP [APP-130]**, outlines how the construction traffic will be monitored. For those vehicles where the use of the A602/A505 corridor could be justified, appropriate restrictions would be agreed with the relevant highway authorities. Such restriction could include consideration of measures that would mitigate air quality impacts (e.g. avoiding hours of congestion, using low or zero emission vehicles). Also, the **Code of Construction Practice**, **Appendix 4.2 of the ES [APP-049]**, states in section 8.4.1.h. that. "The lead contractor will be provided with a specification that all HGVs used on and off-site should meet Euro VI emission standards as a minimum requirement". This will further mitigate the emissions from any construction traffic deviating from the PRN.

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	The Applicant has enquired on whether there is information on the distribution of construction traffic for Project Curium, but there is no data currently readily available. The ES for Project Curium (Luton Council Planning reference: 12/01400/FUL - ES Chapter 13) (Ref 2), did not set out any specific details of the distribution of construction traffic. The ES for Project Curium did state that to minimise the impact of construction vehicles accessing the site, vehicles would travel via designated routes to be agreed with relevant bodies including the highway authorities. The approach and use of designated routes for the Airport Expansion is consistent with Project Curium and many other major projects. Considering the management and monitoring of construction traffic outlined in the CTMP, the small number of construction traffic that may use the A602/A505 corridor would not be expected to materially change the results and conclusions in the air quality assessment (currently predicting negligible and not significant impacts), particularly considering the conservatism in the approach to road traffic emissions in the air quality assessment.
AQ.1.4	**Question:** Assumptions – 85% thrust Provide further justification for the use of 85% thrust rather than the ICAO default 100% thrust as referenced in the ES [AS-028, Appendix 7.1, paragraph 3.7.23] drawing on evidence from actual aircraft operations where possible.
	Response: Actual take-off thrust settings are not routinely available on a flight-by-flight basis. For Project for Sustainable Development of Heathrow (PSDH), British Airways developed a methodology that enables information on take-off thrust to be derived from information on actual aircraft take-off weight. The methodology is based on their analysis of an extensive set of take-off thrust and weight data for their fleet at Heathrow. More recent airport emission inventories recognise that large jets usually do not take off at 100% thrust, with the actual thrust selected depending on take-off weight and air temperature. As stated in section 3.7.23 in **Appendix 7.1 Air Quality Methodology Revision 1 of the ES [AS-028]**, 85% thrust for take-off has been used in airport emissions inventories for major UK airports. For example: Heathrow Airport (Ref 3), Stansted Airport (Ref 4) and Gatwick Airport (Ref 5). Therefore, it is considered that this approach is appropriate for use at London Luton Airport. Furthermore, the emissions from take-off roll are ground level on the runway and modelling thrust at 100% would not be expected to significantly affect concentrations at receptors further away from the airport boundary.
AQ.1.5	**Question:** Runway modal split Does the CAA have any comments regarding the 30:70 runway modal split [AS-028, Appendix 7.1 Air Quality Methodology rev1, paragraph 3.7.6 and Table 3.5] used to inform modelling of emissions and the fact that this differs from the 10 year average 23:77 modal split used for the noise model [AS-096 Appendix 16.1, Section 6.15]? You may wish to link the answer to this question with the answer to NO.1.1.
	Response: The Applicant's position with regards to this question is provided in response to Action 5 of the **Applicant's Post Hearing Submission – Issue Specific Hearing 5 (ISH5) [REP3-052]**. The use of a 70:30 annual split is correct to use for the air quality assessment as the 10 year average 77:23 split only relates to the 92 day summer period, so it is not the correct ratio for annual concentration modelling within the air quality assessment.
AQ.1.6	**Question:** Project for the Sustainable Development of Heathrow The ES [AS-028, Appendix 7.1 Air Quality Methodology rev1, Table 7.1] references use of the 'Project for the Sustainable Development of Heathrow' method for deriving fractions of primary Nitrogen Dioxide (NO2). Explain how the methodology can be accessed by the public and/ or provide a copy of the methodology.
	Response: The Project for the Sustainable Development of Heathrow Panel Report (Ref 6) (PSDH) was archived on 13 May 2010 on The National Archives website. The primary Nitrogen Dioxide (pNO_2) fractions are provided in Table 3.3 of the report. This methodology was informed by a report from the University of Sheffield (Garcia-Naranjo & Wilson 2005) (Ref 7). The Table is reproduced in Table 5.1 of a report (Ref 8) prepared by Cambridge Environmental Research Consultants (CERC) in 2007.
AQ.1.7	**Question:**

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	Pollutants and averaging periods The ES [APP-062, Appendix 7.2, Table 1.4] references the running mean for benzene of 16.25µg/m^3 but not the annual mean of 5 µg/m^3, annual averages are also referenced for toluene, ethylbenzene and xylene but not the short term 1-hour averages. The 24-hour mean is not stated for naphthalene. Explain why some but not all standards have been reported or provide justification for their exclusion.
	Response: The monitoring data for the volatile organic compound (VOC) species of Benzene, Toluene, Ethylbenzene, m/p Xylene and o-Xylene (BTEX) and Naphthalene have been provided as part of **Appendix 7.2 Air Quality Baseline Data of the ES [APP-062]** for information only and those standards requested in AQ.1.7 have been included below for information. The monitoring data for VOCs do not affect the assessment of likely significant effects of the Proposed Development on air quality as there is no risk of the volatile organic compound species exceeding the objectives. Table 1 provides a comparison of the data monitored at LA001 against the standards mentioned in AQ.1.7. The comparison between the maximum 24-hour mean Naphthalene standard and monitored result at LA001 monitoring station has not been reported. Ricardo Energy & Environment who provide quality assurance/quality control and data management services for the LA001 monitoring station on the Air Quality England website have advised that the 2021 data should not be used. This is because prior to 2022, the methodology used to monitor naphthalene led to the levels of samples being below a range that can be accurately quantified by the equipment. This issue has since been resolved in 2022 and the data is available at the Air Quality England website. Table 1: Monitoring results for volatile organic compounds at LA001

Pollutant	**Averaging period**	**Standard (µg/m^3)**	**Result (µg/m^3)**	
			2020	**2021**
Benzene	Annual mean	5	0.3	0.2
Toluene	Max 1-hour mean	8,000	4.6	25.0
Ethylbenzene	Max 1-hour mean	55,200	2.2	11.2
m/p-xylene	Max 1-hour mean	66,200	6.4	39.3
o-xylene	Max 1-hour mean	66,200	2.4	14.0

AQ.1.8	**Question:** Use of generators The ES **Appendix 7.5 Outline Operational Air Quality Plan [APP-065]** references the phasing out of diesel generators. Explain how the airport would deal with peaks and troughs in energy/ heat generation from solar panels resulting from adverse weather conditions including diurnal and annual variations, what assumptions have been made regarding the need for backup power generation and how this has been reflected in the modelling.
	Response: Diesel generators are currently used at the airport for the purposes of a secondary (back-up) electricity supply in case of a failure of the mains power supply and are not used to supplement the mains supply and this would remain the case in relation to future energy demand. The grid connection would supplement on-site generated electricity from photo-voltaic cells. However, energy from photo-voltaic cells would feed into the airports electricity network and be used in preference to the grid whenever power is being generated and it is the intention to maximise on site power generation and reduce consumption on an annualised basis. The Applicant considers the assessment has been conservative with regards to generator emissions in the future, which reasonably reflects any potential future need to run backup generators. The conservative approaches are listed in the assumptions and limitations table, Table 7.1 in **Appendix 7.1 Air Quality Methodology Revision 1 of the ES [AS-028]**. Forecast fuel was not available, so it was assumed that the fuel used by existing terminal buildings would increase in line with passenger growth, which includes fuel used by generators. This is assumed to be conservative because the T2 proposed engineered servicing of the terminal building will be designed to meet exacting standards with regards to energy conservation and sustainable principles, including meeting 'BREEAM Excellent' criteria and will not have any gas combustion. For example, photovoltaic panels would be installed on the roof, as well as ground source heating and cooling systems under the terminal to deliver a source of sustainable energy as in **Appendix 12.1 Outline Greenhouse Gas Action Plan within the ES [APP-081]**. This conservative approach is considered to reasonably reflect within the emissions modelled any potential need for backup power generation from generators in the future.

PINS ID	Question / Response
AQ.1.9	**Question:** Water Treatment Plant sludge handling ES Chapter 4 [AS-074, paragraph 4.8.33] states that sludge produced on site from Moving Biological Bed Reactors and Dissolved Air Flotation would be thickened and stored for tankering off site. Could storing sludge in this way give rise to odour emissions and if so, how would these be minimised?
	Response: As stated in the Applicant's response to Action 12 of the **Applicant's Post Hearing Submission – Issue Specific Hearing 5 (ISH5) [REP3-052]**, thickening and storage of sludge for offsite disposal by tanker is proposed at the water treatment plant (WTP) which would be an enclosed system, and odour control plant would be provided for malodours areas and operations. The enclosed system, coupled with odour control plant would be expected to minimise odour. Furthermore, if the preferred drainage and water treatment strategy is confirmed, described in the **Change Notification – Drainage Strategy [AS-152]** and the updated **Drainage Design Statement [TR020001/APP/5.02,** Appendix 20.4**]**, the nature of the wastewater would be different and biological steps would be removed from the treatment process as foul water would be discharged to the sewer rather than treated on site, which would remove the risk of odour from sludge.

REFERENCES

Ref 1 Department for Environment Food & Rural Affairs. (2022) Local Air Quality Management Technical Guidance (TG22) August 2022.
Ref 2 Planning Application to Luton Borough Council, reference 12/01400/FUL
Ref 3 AEA Energy and Environment. Heathrow Airport Emission Inventory 2008/9, 2010. (Online).
Ref 4 Transforming London Stansted Airport, 35+ Planning Appeal, ES Addendum: Air Quality Appendix 10.A Air Quality
Ref 5 Gatwick Airport Northern Runway Project, Environment Statement, Appendix 13.4.1: Air Quality Assessment Methodology
Ref 6 DfT (2006) Project for the Sustainable Development of Heathrow. Report of the Airport Air Quality Technical Panels.
Ref 7 Garcia-Naranjo, A. and Wilson, C.W. (2005) Primary NO2 from Aircraft Engines Operating over the LTO Cycle. Report RC110187/05/01. Department of Mechanical Engineering, University of Sheffield, Sheffield, UK.
Ref 8 CERC (2007) Air Quality Studies for Heathrow: Base Case, Segregated Mode, Mixed Mode and Third Runway Scenarios modelled using ADMS-Airport, Fina report, Prepared for Department for Transport 15 November 2007