

Air Quality Review V1 for 20/01686/FULL - Development Site at Padnall Lake, Padnall Road, Romford, RM6 5ER

Prepared by the Centre for Health Services Studies, 25/11/2020,
Professor Stephen Peckham & Dr Ashley Mills. Contact:
ajsm@kent.ac.uk

Site	Development Site at Padnall Lake, Padnall Road, Romford, RM6 5E
Applicant	London Borough of Barking and Dagenham (LBBD)
Barking and Dagenham reference	20/01686/FULL

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1. Introduction

1. The Centre for Health Services Studies at the University of Kent has been commissioned by Marks Gate Padnall Views Action Group to provide an independent review of air quality and air quality assessments submitted in relation to the proposed development at Padnall Lake, Padnall Road, Romford (Barking and Dagenham planning application 20/01686/FULL [1]).
2. This document has been prepared by Professor Stephen Peckham and Dr Ashley Mills. Stephen is Professor of Health Policy and Director of the University of Kent's Centre for Health Services Studies and Professor of Health Policy at the London School of Hygiene and Tropical Medicine. He has been working with local residents groups, Parish Councils and voluntary groups on air quality issues in Kent and Essex to undertake air quality monitoring and support submissions to planning consultations.

3. Dr Ashley Mills is a published air quality expert with a doctorate in Systems Engineering. He has 16 years of experience of mathematical modeling of complex physical systems and statistical analysis of them.
4. The arguments set out here refer to the air quality report called “Padnall Lake Air Quality Assessment” produced by Ramboll Ltd on Behalf of Be First Ltd [2].

2. Summary

5. The developer has produced a minimal-effort model derived from two baseline data points which are not representative of the development area, taken from between 2 and 4km away, from sites with atypical characteristics and in discord with those of the development area. As the baseline data is not representative, this is not consistent with the requirements of the LBBB EHO.
6. The developer’s model is “verified” using only these two data points, producing a meaningless RMSE that provides no understanding of the real-world performance of the model across a variety of conditions and in the environment of the development itself.
7. On this basis, the development should not be considered until a model is presented that:
 - uses representative baseline data, which is likely to require additional local diffusion tube modeling for a period of one year in the area of the actual development
 - Is verified using multiple locations in the area of the actual development
8. Thus the planning application should be rejected as it stands since it is not possible to make an informed assessment of air quality using the information provided.

3. Criticisms of Air Quality Assessment

3.1. Baseline data is not representative

9. On page 2 of the developers AQA [2], the developer states, with respect to the air quality assessment scope and methodology, that:

“The proposed scope and methodology were approved by the LBBB EHO in an email on 16 March 2020 with the proviso that the baseline data for the assessment be representative.”

10. In Section 6.1.2 of the developer’s AQA, they specify which data is used for baseline verification, and describe two diffusion tubes located in the Borough of Havering. These are a triplicate: HAV13,14,15 and a site HAV39. These are described as being “between 2 and 3 km east of the site” (page 20, para 5), but their Table 6.1 on page 20 states that they are ~2.2km and ~3.5km from the site respectively so would more accurately be described as being between 2 and 4km from the site.

11. The images below show the aerial and streetview images for these diffusion tubes.



HAV39 Aerial



HAV39 Streetview



HAV 13,14,15 Aerial



HAV 13,14,15 aerial



HAV 13,14,15 Streetview

12. In Appendix 3 of the developers AQA, they outline the model verification procedure and state that the model is verified using two diffusion tubes located in the Borough of Havering. Both of these sites are quite atypical for Roadside sites, the first being not directly on the A12, and the second being in a green area set back far from the A12 and partially occluded

by trees from the road. From the perspective of the A12 they both set back considerably and it is a stretch to call these “roadside” in the context of the A12.

13. The facades of the new development onto the A12 on the other hand are much more characteristic of typical “roadside” locations and as such would be better represented by baseline data that reflects this.
14. Also we can see from the developer’s modeled road network figures A5.1 and A5.2 that the road characteristics of the verification sites are considerably different with the HAV 39 location being modeled between 72 and 28 kph, and the HAV13,14,15 location being modeled at 15kph. Whereas modeled receptors R1, R3, and R4 are all on a road with speeds between 15kph and 35kph.
15. Using a single adjustment factor and single model for such a wide variety of conditions is unlikely to produce an accurate model. This is backed up by LAQM.TG(16) [3] which states in section 7.524 that:

“In addition to the consideration of roadside and background sites during model verification, local authorities should also consider separating different types of locations when comparing modelling and monitoring. For example, modelling undertaken for roadside sites in urban areas may require a different adjustment to modelling undertaken for roadside sites near motorways or trunk roads in open settings.”

16. In summary, the two locations chosen as verification points for the model are not representative of the development site.

3.2. Model verification is inadequate

17. Appendix 3 of the developer’s AQA outlines the verification procedure followed for the air quality model.
18. The section proudly states that the model obtains an “(RMSE) with an error of $\pm 0.23 \mu\text{g}/\text{m}^3$ ($\pm 1\%$), i.e. well below the $\pm 10\%$ recommended by TG(16).”
19. However, this figure is meaningless because the model is verified with only two data points. It is always possible to fit a linear model exactly to two data points, algebraically and obtain zero error.
20. This gives no information as to how the model performs generally.
21. Given also that the verification sites are not representative of the development area, the results of the model should not be considered reliable or representative and should be discarded in their current form.

4. References

- [1] '20/01686/FULL - Padnall Lake residential development hybrid planning application', 20-Aug-2020. [Online]. Available: <https://online-befirst.lbbd.gov.uk/planning/index.html?fa=getApplication&id=26213>
- [2] Ramboll Ltd on behalf of Be First Ltd, 'Padnall Lake Air Quality Assessment', Aug. 2020 [Online]. Available: https://online-befirst.lbbd.gov.uk/planning/?fa=downloadDocument&id=211629&public_record_id=26213
- [3] 'Local Air Quality Management Technical Guidance (TG16)'. DEFRA, Feb-2018 [Online]. Available: <https://laqm.defra.gov.uk/technical-guidance/>. [Accessed: 03-Jun-2019]