

Response to “Air Quality Evidence Review”

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Phlorum’s review of Entran’s AQA is uncritical

Phlorum provides a review [10] of the Wises Lane Air Quality assessment performed by Entran Ltd on behalf of Quinn Estates Ltd. They do not state which of the two versions of Entran’s AQA [4] or [5] was reviewed or whether they are aware of the two versions. Accordingly no appraisal is given as to why those two reports differ by upto 31% for some predicted pollutants. Phlorum’s review appears cursory and uncritical. For example, Phlorum states in paragraph 4.9 that

“The AQA used the most relevant inputs for modelling including: meteorological data, most relevant sensitive receptor locations, NO_x to NO₂ conversions, sourced traffic data verified by transport consultants and DfT, verification followed official guidance, sourced local background data, most up-to date Defra emission factors, damage cost calculator values and methodology”

Examining the claim that “verification followed official guidance”, the Defra guidance states that:

“7.526 For the verification and adjustment of NO_x/NO₂, a combination of continuous monitoring and diffusion tubes is recommended. As described above, some types of sites can perform differently, and it is considered better to have multiple sites at which to verify results rather than just one continuous monitor. The use of one continuous monitor alone to derive the adjustment factor for a model is not recommended as the monitoring site may not be representative of other locations modelled, and the adjustment factor derived will be heavily dependent on the source to receptor relationship as represented by the meteorological data file used in the dispersion model.”

Entran’s AQA does not use any continuous monitoring sites, which goes against this recommendation and thus to claim that verification followed official guidance is false. Furthermore, Entran use only two sites for verification. The technical guidance specifically warns against the use of a single site, and it clearly indicates that it is “*better to have multiple sites at which to verify results*”. Entran use only two sites, both diffusion tubes, in the verification of their NO₂ predictions, which is inappropriate given the scale of the development and the number of receptors that are potentially impacted.

As a second example, to claim that Entran's AQA uses "*the most relevant inputs*" for "*meteorological data*" is also false. Entran use a wind rose from Charlwood Airport Meteorological Station (from 2016) that is not only 2 years out of date, but is 45 miles away from the development area. Borden grammar school has a weather station approximately a mile away from the planned site, whose wind rose indicates an entirely different prevailing direction (SE instead of SW) (<http://weather.bordengrammar.kent.sch.uk/>) and has a qualitatively different annual rose. The latter is the weather data used by the UoK AQA and is a more local and appropriate data source. Thus Entran's AQA does not use "*the most relevant inputs*" and Phlorum's claim that it does is false.

Phlorum's review of the UoK AQA is uncritical

In Section 5, Phlorum Ltd criticise UoK's AQA [11] and completely dismisses the findings. It is scientifically uncritical to dismiss findings without attempting to put them in context, or to understand their obvious (however limited) applicability. It should be clear that it is not a binary matter whether the UoK findings should be considered or not, since they are presented in a rational manner with sound assumptions. They should be taken on merit and considered properly, comparatively against Entran's claims.

Phlorum claim in paragraph 5.5 that

"The assessment referenced measurements which were short-period measurements that cannot be compared to annual exposure limits. DEFRA technical guidance requires a minimum of 3 months of continuous monitoring in order to obtain representative pollutant concentrations"

This claim is both true and false. Whilst the statements about DEFRA's technical guidance [9] are correct, we have already observed that a double standard is applied by Phlorum: Entran does not follow the guidance to the letter on NO₂ verification, a fact not only ignored by Phlorum but stated in opposition to the truth. The UoK work was limited to 2 months NO₂ monitoring because of the temporal constraints imposed by BPC. Despite this, the UoK work which takes great pains to annualise its data in a manner consistent with DEFRA's technical guidance, is dismissed out of hand by Phlorum without any attempt to understand the applicability of the data.

The UoK work has merit and the correct question to ask isn't a binary proposition as to whether or not it is acceptable, but how it compares to Entran's report and its assumptions in accuracy and its potential for error.

The UoK report applies an annualisation process has been described and used which accounts for the shortfall in measurement. Any error inherent in this shortfall is likely to be less than the 25% error permitted by DEFRA for NO₂ verification which could be present in Entran's predictions (we can't tell because only two points are described by Entran).

We would argue that Phlorum’s criticism in this regard is unfair since despite the necessary shortfalls of the UoK AQA, it is likely to be more accurate than the Entran AQA.

Section 5.6 of Phlorum’s review states that:

“Measurement sites were not at sensitive receptor locations as per the Wises Lane AQA. Pollutant concentrations drop off rapidly with distance from the roadside to receptors, therefore a comparison of 2018 results to 2025 modelled results is not valid”

This is over-stated. Many of the properties in the area considered front directly onto the road and are unlikely to differ appreciably from the receptors modelled by Entran. We don’t have to speculate in that regard as DEFRA provides a falloff calculator [7], which estimates the NO₂ level at a distance away from the kerb, given a measurement made at a certain distance from the curb, and DEFRA background NO₂ values for the OS grid.

Applying this to our data points, it is clear that there are still discrepancies, and points where the measured values exceed Entran’s modeled values, or more generally where they arrive at differing conclusions so our criticism is still valid.

In paragraph 5.14 Phlorum claims that *“the particulate equipment used was not appropriate”*.

This is a complete strawman of our position, since we:

1. Provide details of several co-location studies with reference equipment that demonstrate the DC1700 is suitable for the task of roadside monitoring (See Table 1 below which explicitly lists studies applying the DC1700 in outdoor scenarios)
2. Calibrate the DC1700 against an AURN reference site (Chatham Roadside), and show residual errors of around 0.25 ug/m3.

Phlorum’s criticism completely ignores these facts so can be dismissed.

Study	Study focus	Reference equipment	Env	R ²
[1]	Low cost portable particulate monitoring	Grimm 11-R	Suburban	0.78
[2]	Personal exposure study using volunteers with backpacks	Two DEFRA AURN sites (rural and urban)	Rural and Urban	0.90, 0.70
[3]	Low cost aerosol sensing	Class III EPA B-attenuation regulatory site (hourly and 24hr)	Urban	0.60, 0.72

Table 1 - Studies using the Dylos DC1100 or DC1700 in (outdoor) co-location with reference equipment along with resultant R² values from regression analysis

Phlorum state in paragraph 5.8 that:

“The UoK assessment compared 2018 results to 2025 modelled results, the two cannot be compared”.

Since Entran did not provide modelled values for 2018, there was no alternative. But this misses the point. Since the discrepancies between the UoK measurements and Entran’s predictions were both positive and negative, they occupy a saddle position which contradicts Entran’s work **regardless of whether emissions decrease or increase**. Thus it is completely appropriate to compare these results, given the discrepancies identified.

Summary

Phlorum provide a cursory review of Entran’s AQA which is, essentially, uncritical praise. It is demonstrably uncritical as evidenced here by discrepancies identified between that which Phlorum claims Entran’s AQA to state, and the actual contents of Entran’s AQA.

On the other hand, Phlorum is completely dismissive of UoK’s AQA and makes no attempt to critically assess its claims or to understand the evidence based approach used. It is possible, as in our case, for a process to be different from a recommended approach, and yet still be accurate. The UoK report should be qualitatively judged on its own merits, not threshold rejected on the basis of arbitrary and minor complaints without any reflection or consideration of the actual contents.

No comparison of the accuracy or likelihood of error between the UoK’s AQA and Entran’s AQA is provided by Phlorum so there is no context within which to judge the claims of Phlorum’s review.

The claims made individually about each report by Phlorum are meaningful only in direct comparison, along the dimensions of accuracy of baseline assumptions, potential for error in modelling, etc.

The pertinent question, never asked by Phlorum, is which is more accurate. We argue that the UoK report is likely to be more accurate than the Entran report and should be considered the more authoritative of the two.

References

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- [4] Quinn Estates Ltd Land at Southwest Sittingbourne, Kent Environmental Statement: Volume 1, Main Text, Revision 1.2, 20/09/17, Entran Limited
- [5] Quinn Estates Ltd Land at Southwest Sittingbourne, Kent Environmental Statement: Updated Air Quality Chapter, Revision 1.3, 10/05/18, Entran Limited
- [6] Land at Southwest Sittingbourne, Kent, ES Addendum Information Explanation Note, 07/06/18, Entran Limited
- [7] Nitrogen Dioxide falloff with distance calculator, DEFRA, <https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>
- [8] Annual New Car Registrations, Society of Motor Manufacturers and Traders (SMMT), <https://www.smmt.co.uk/vehicle-data/car-registrations/>
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- [10] Air Quality Evidence Review, Manor Farm, Sittingbourne, Kent, October 2018 - Phlorum Ltd
- [11] Air Quality Report for Borden Village Parish Council, 20 June 2018 - Centre for Health Services Studies, University of Kent