



**Air Quality Review:**  
Wheelabrator Harewood  
Waste to Energy Facility –  
Review of Air Quality  
Sections of PEIR

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November 2019



Experts in air quality  
management & assessment

## Document Control

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### Document Status and Review Schedule

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# 1 Introduction

1.1 Air Quality Consultants Ltd (AQC) has reviewed Chapter 7 (Air Quality), Appendix 7.1 (Air Quality), and related sections of Chapter 10 (Biodiversity) and Appendix 4.1 (Outline CEMP) of the Preliminary Environmental Information Report (PEIR) which has been submitted on behalf of WTI/EfW Holdings Ltd. to support consultation for a proposed Waste-to-Energy plant to the north of Barton Stacey in Hampshire (the ‘Scheme’). This review has considered:

- whether the air quality assessment is robust;
- whether the reported conclusions are supported by the evidence provided; and
- whether the information presented is sufficient to understand the likely air quality impacts of the scheme.

1.2 Where errors or omissions have been identified, they have been categorised as either a:

- **Major Issue** - in the opinion of the reviewers, any one individual failing would be highly likely to invalidate the reported conclusions;
- **Moderate Issue** - weaknesses have been identified which, individually, may or may not affect the conclusions ; or
- **Minor Issue** - weaknesses have been identified but the professional experience of the reviewers suggests that each one, in isolation, would be unlikely to affect the conclusions of the assessment. There remains, however, the potential for multiple minor issues to combine to invalidate the reported conclusions. Minor issues have also been identified where the material presented is unclear, misleading, or otherwise inappropriate to inform the consultation.

1.3 A large number of failings with the PEIR have been identified. Furthermore, the information presented within the PEIR is frequently unclear, contradictory, or misleading. For these reasons, the failure of this current note to highlight additional issues does not mean that no further issues exist or that the assessment is, in other respects, accepted. The professional experience of the consultants carrying out this review is summarised in Appendix A1.

## 2 Errors and Omissions in the PEIR

### Major Issues

#### *Predicted Exceedences of the Air Quality Objective and Limit Value*

- 2.1 The Industrial Emissions Directive ('IED') sets different limits for emissions depending on whether they are averaged over long or short durations. The difference allows for short periods with higher emissions on the basis that, when averaged out over longer periods, the emissions will be lower. For nitrogen oxides (NO<sub>x</sub>) there is one limit for half-hour average emissions and one limit for daily average emissions<sup>1</sup>.
- 2.2 The UK Government has set two air quality Objectives for ambient nitrogen dioxide (NO<sub>2</sub>) concentrations<sup>2</sup>. One relates to annual mean concentrations and one to 1-hour mean concentrations. The European Commission has set the same concentrations, over the same averaging periods, as Limit Values.
- 2.3 It is common and best practice to use the short-term emissions limits to assess impacts in relation to the 1-hour mean nitrogen dioxide Objective and the long-term emissions limits to assess impacts in relation to the annual mean Objective. The PEIR provides this assessment but these results are then not reflected in the reported conclusions. The argument is instead made<sup>3</sup> that the daily-mean emissions limits are most appropriate in relation to the 1-hour mean objective. This is not robust since, as shown in Table 4-12 of Appendix 7.1, short-term emissions may be much higher than daily-mean emission rates; meaning that achieving a daily-average emission limit does not preclude exceedences of the 1-hour mean objective. Neither is such an approach typical practice.
- 2.4 The most appropriate<sup>4</sup> results in relation to 1-hour mean nitrogen dioxide concentrations are those presented in Table 5-12 of Appendix 7.1. These predict that the Scheme will cause an exceedence of the UK Objective for 1-hour mean nitrogen dioxide concentrations. No information is given regarding where the values in Table 5-12 of Appendix 7.1 have been predicted; which might be used to consider whether or not they represent relevant exposure in relation to either the 1-hour mean Objective or the 1-hour mean Limit Value<sup>5</sup>. There is thus no credible evidence provided as to why the Scheme, as assessed, will not cause an exceedence of the UK Objective. Similarly, while exceedences of the Limit Value are ultimately reported by Defra rather than by

<sup>1</sup> The PEIR modelling uses a daily average emission rate which is lower than the IED and it is reasonable to expect this to be reflected in any permit to operate which is ultimately granted by the Environment Agency.

<sup>2</sup> NO<sub>x</sub> is the sum of nitric oxide (NO) and NO<sub>2</sub>. NO<sub>x</sub> emissions tend to be dominated by NO, but NO can form NO<sub>2</sub> in the atmosphere. Thus, while the air quality Objectives are for NO<sub>2</sub> the relevant emission limits are for NO<sub>x</sub>.

<sup>3</sup> in Paragraph 5.49 of Appendix 7.1

<sup>4</sup> Subject to the other assessment limitations identified in this note.

<sup>5</sup> It would be usual to use isopleth maps showing the areas of exceedence for this purpose.

individual developers, no information is presented as to why the Scheme, based on the modelling presented, will not cause an exceedence of the Limit Value and thus a breach of European law.

- 2.5 Based on the modelling presented, Paragraph 7.4 in the conclusions of Appendix 7.1 is plainly incorrect. This paragraph describes “*small increases*” in concentrations and states the concentrations would be “*within current environmental standards for the protection of human health*”. The evidence presented in Appendix 7.1 suggests the opposite.
- 2.6 Similarly, the appropriate results from Appendix 7.1 regarding the 1-hour mean NO<sub>2</sub> objective are not reported in Chapter 7 of the PEIR. Instead, the assessment focuses on the result at the worst-case receptor with respect to the annual mean objective (see Table 7-14 of Chapter 7). This is additionally misleading since the 1-hour objective can apply in locations where the annual mean objective does not.

### **Emergency Back-up Generators**

- 2.7 It is routine practice on schemes similar to this to include a backup source of electrical power in order to avoid major accidents during emergency shut-down. Where back-up generators are used, it is usually a requirement to test these regularly by running them for short periods. The nature of the back-up plant which are often used is such that the air quality impacts of their requisite testing can be significant, even if this testing is only for short periods. No mention is made, within Chapter 7 or Appendix 7.1, of emissions from back-up generators. It is unclear whether this is because such generators will not be used, or because they have been erroneously omitted from the assessment. Clearly, if it is the case that back-up generators will be routinely operated as part of the Scheme, then this represents a major omission from the PEIR since the air quality impacts will have been misrepresented.

### **Road Traffic Emissions**

- 2.8 Emissions from road traffic have not been included in the PEIR air quality assessment (the PEIR suggests that these emissions will be included in the Environmental Statement (‘ES’)). Road traffic emissions are, however, integral to both understanding the baseline situation and determining the effects of the scheme.
- 2.9 Table 7-5 of the PEIR shows that the impact descriptors used in the PEIR are dependent not only on the incremental increase but also the baseline concentrations to which this increase is added. As an example of this, Table 7.3 of the PEIR determines a “Negligible” effect at Receptor R1, which is based on the main exhaust stacks increasing annual mean nitrogen dioxide concentrations by 1.3 µg/m<sup>3</sup> above an assumed baseline concentration of 9.5 µg/m<sup>3</sup>. However, Table 7-5 of the PEIR shows that if the assumed baseline concentration were higher, then the same incremental change which is currently categorised as “Negligible” might be considered either “Moderate” or “Major”. Thus, it is not possible to know whether a 1.3 µg/m<sup>3</sup> increase in annual

mean nitrogen dioxide concentrations is “Negligible”, “Minor”, “Moderate”, or “Major”, without first understanding the baseline concentration.

- 2.10 The assumed baseline annual mean nitrogen dioxide concentration used at Receptor R1 is  $9.5 \mu\text{g}/\text{m}^3$ , which is the concentration measured at the Chilbolton Observatory; 6 km from the scheme and well away from any main roads. Receptor R1 is immediately adjacent to the A303, where it is inevitable that concentrations will be much higher than those measured at Chilbolton because of emissions from existing road traffic on the A303.
- 2.11 Thus, notwithstanding the omission of the *scheme-related* traffic in the air quality assessment, the failure to even include *existing* traffic on local roads leads to a position where it is not possible to determine whether the impacts are “Negligible”, “Minor”, “Moderate”, or “Major”. The PEIR bases the conclusion that the air quality effects will be “not significant” on all of the changes being “Negligible”, but there is no robust basis for reaching this conclusion.
- 2.12 The PEIR thus does not provide sufficient evidence to determine baseline conditions nor whether or not the impacts of the scheme are likely to be significant. Furthermore, Appendix 7.1 of the PEIR is highly misleading in this respect. The methodology description does not align with the results presented. Furthermore, and for example, Table 5.7 is entitled “*Predicted change in ..... due to emissions from the WtE and operational traffic emissions*” (emphasis added). The traffic component of this change has, however, been omitted from the values presented. All of the description in Appendix 7.1 regarding these results is thus incorrect. Similarly, all description of the impact of the scheme on  $\text{NO}_2$ ,  $\text{PM}_{10}$ , and  $\text{PM}_{2.5}$  concentrations in Chapter 7 of the PEIR (in particular 7.143 to 7.148 and Table 7.17) will be incorrect and potentially misleading.

### ***Impacts on Designated Ecological Sites***

- 2.13 Appendix 7.1 of the PEIR predicts that the Scheme will cause exceedences of its adopted screening criteria at all of the ecological sites considered and at the priority habitats. Chapter 10 of the PEIR states that the implications of this will be considered in the ES. It is thus not currently possible to make any judgement regarding whether the impacts of the scheme on these sites are acceptable. Nevertheless, Paragraph 7.6 of the conclusions section of Appendix 7.1 states that none of the impacts are considered significant. There is no evidence to support this assertion. Furthermore, the fact that a conclusion has been reached and reported for consultation before carrying out the assessment is scientifically troubling.

### **Moderate Issues**

#### ***Critical Level for Annual Mean Ammonia***

- 2.14 There are two points of note in relation to this critical level. The first is a simple point of clarification. Paragraph 7.13 states that a more stringent critical level for ammonia applies where

lichens and bryophytes “are present”. This is correct, but this more stringent critical level also applies where lichens and bryophytes are not currently present but are important to ecosystem integrity. The importance of this distinction has recently been clarified by one of the leaders of the group responsible for setting this critical level, Prof. Mark Sutton, when he wrote (in relation to another air quality assessment carried out by AECOM):

*“AECOM considers that “the critical level of ammonia of 1  $\mu\text{g}/\text{m}^3$  is only relevant if significant lichen interest is present within the affected area, otherwise the more appropriate critical level is 3  $\mu\text{g}/\text{m}^3$ . AECOMs investigations indicate that the area ... does not support significant lichen interest. This represents an error of understanding by AECOM. When we revised the ammonia critical level, I made sure that the statement was included that this was a critical level set for “Lichens and bryophytes (including ecosystems where lichens and bryophytes are a key part of ecosystem integrity)” (2017 edition of the UNECE Mapping Manual, Chapter 3)<sup>6</sup>. The intent of the bracketed clarification was to make certain that habitats where lichens and bryophytes are part of the integrity would not be excluded, whether or not lichens were actually present at particular locations.”<sup>7</sup>*

- 2.15 It is thus essential that the more stringent critical level for annual mean ammonia (1  $\mu\text{g}/\text{m}^3$ ) is used wherever lichens and bryophytes are part of the ecosystem’s integrity, whether or not they are actually present at particular locations. Full justification should be given wherever the higher critical level for ammonia is used. At present, no information is provided and so it is not possible to ascertain whether the assessment is robust.
- 2.16 The second point of note regarding this critical level is potentially is more concerning. Table 4-15 of Appendix 7.1 to the PEIR lists site-specific critical levels which are 1  $\mu\text{g}/\text{m}^3$  for some sites and 3  $\mu\text{g}/\text{m}^3$  for others. However, when it comes to assessing the modelled impacts of the Scheme, Table 5-15 of Appendix 7.1 uses the higher critical level (3  $\mu\text{g}/\text{m}^3$ ) for all sites. For example, Receptor E1 has a reported critical level of 1  $\mu\text{g}/\text{m}^3$  in Table 4-15 and of 3  $\mu\text{g}/\text{m}^3$  in Table 5-15. While both critical levels are predicted to be exceeded, the magnitude of exceedence is much higher if the lower critical level is used.
- 2.17 Either Table 4-15 of Appendix 7.1 to the PEIR is incorrect, or Table 5-15 is. Both tables cannot be correct. The information in the PEIR is thus not sufficient to be able to understand the likely effects of the Scheme.

### **Field Margin SINC**

- 2.18 Paragraph 4.35 states that Field Margin SINC has been excluded from the assessment “as there is no appropriate critical load for this habitat type”. However Paragraph 3.8 correctly states: “The critical levels for the protection of vegetation and ecosystems ... apply regardless of habitat type”.

<sup>6</sup> [https://icpvegetation.ceh.ac.uk/sites/default/files/FinalnewChapter3v4Oct2017\\_000.pdf](https://icpvegetation.ceh.ac.uk/sites/default/files/FinalnewChapter3v4Oct2017_000.pdf)

<sup>7</sup> <http://www.wealden.gov.uk/nmsruntime/saveasdialog.aspx?IID=26266&SID=6796> (Paragraph 140).

The absence of a published critical load for nitrogen deposition does not preclude an assessment against the relevant critical levels for ambient concentrations and so no justifiable reason has been given for excluding this SINC from the assessment. The information in the PEIR is thus not sufficient to be able to understand the likely effects of the Scheme.

### **Stack Height Testing**

- 2.19 Paragraphs 5.25 and 5.26 of Appendix 7.1 state that there are pronounced benefits associated with increasing the stack height to 80-85 m and yet a stack height of 70 m has been assumed. No explanation is given as to why the benefits associated with increasing the height to 85 m are not considered worthwhile. Basing the design on 70 m stacks will result in greater impacts than would be the case if higher stacks were used. Since, based on the information presented in the PEIR and as explained elsewhere in this note, it is not possible to reach a robust conclusion that the air quality impacts of the Scheme will be acceptable, it must be concluded that using 70 m stacks might cause unacceptable impacts which might be mitigated using taller stacks.
- 2.20 Paragraph 5.27 states that “*The graph illustrates that the use of a stack releasing emissions at 70 m above ground level or greater would be capable of mitigating both the short-term and long-term impacts of the modelled emissions of all pollutants, **such that no significant effects would occur at any receptor***” (emphasis added). The graph shows no such thing. Emissions have been modelled at a nominal unit emission rate and the graph is purely illustrative of the rate of decay. As explained elsewhere in this note, it is not currently possible to say that there will be no significant effects of the Scheme, either from this graph, or from any of the other material set out in Appendix 7.1 or Chapter 7 of the PEIR.
- 2.21 A minor additional point is that Figure 5.1 shows an orange line and a blue line, one of them represents annual mean NO<sub>2</sub> concentrations and one represents 99.79<sup>th</sup> percentiles of 1-hour mean NO<sub>2</sub> concentrations. However, there is no labelling to show which is which.

### **Isopleths**

- 2.22 Paragraph 7.136 of Chapter 7 explains that the validity of the assessment presented relies on the modelled isopleths. Furthermore the conclusions section states a maximum distance over which potentially significant impacts have been predicted. However, no isopleths are presented and so it is not possible to gauge whether the assessment is appropriate.

## **Minor Issues**

### **Incorrect Release Rates**

Table 4.11 provides the release conditions which have been modelled using the daily average emissions limits. However, different release rates have been modelled using the short-term emissions limits. This is evidenced simply by comparing Tables 4.11, 4.12, and 4.13. It is entirely

appropriate to use different release rates for the two sets of emissions limits, but by not explaining that this has been done, and providing the correct release rates that have been used, the documentation is incorrect.

### ***Treatment of Benzo[a]Pyrene emissions***

- 2.23 The first step in the assessment is to assume that all polyaromatic hydrocarbons (PAH) are benzo[a]pyrene. This is conservative and an exceedence of the standard, as is the case in the PEIR, does not necessary indicate that there would be an environmental a problem. The next step has been to use an indicative benzo[a]pyrene-specific emission rate. A comment is made that “*This value has been taken from a published assessment undertaken for another proposed WtE facility by AECOM*”. Given the importance of ensuring that members of the public are not exposed to exceedences of this standard, more information on this evidence base and its applicability to the current situation should be provided. Without any evidence, it is not possible to understand the likely effects of the Scheme.

### ***Acid Deposition***

The acid deposition flux presented in Table 5.18 of Appendix 7.1 includes the acidifying effects of nitrogen and sulphur. While it is recognised that the critical load functions are reported in terms of nitrogen and sulphur only, it is common and best practice to also consider the acidifying effects of HCl released from a plant such as this. This has not been done and so the acidifying effects of the Scheme have been under-estimated.

### ***Incorrect Referencing***

- 2.24 Throughout Appendix 7.1 references are made to figures and tables which do not exist, or which contain different information to that stated. Non-exhaustive examples include: Para 4.22 reference to Table 7-15; Para 4.32 reference to Figure 7A.1; footnote ‘a’ to Table 5-4; and Paragraph 5.33 and 5.41 reference to Table 7-29. This misleading information makes it very difficult to understand the air quality assessment. It is also noted that Paragraph 5.54 contains an error which, while simply a minor typographical issue, makes the conclusion potentially misleading.
- 2.25 Paragraph 7.90 of Chapter 7 states that a 1% insignificance criterion has been used, but Appendix 7.1 states that for local ecological sites, this has been relaxed by two orders of magnitude to 100%. Chapter 7 thus suggests that the assessment is more stringent than is, in fact, the case and is thus misleading.
- 2.26 The amount of misleading and incorrect information within the PEIR means that the material is not sufficient to inform the consultation with respect to likely air quality impacts.

### **Background Ammonia Concentrations**

- 2.27 Table 5.5 of Appendix 7.1 of the PEIR explains that background ammonia concentrations have been taken from two separate sources. Concentrations measured at the Chilbolton Observatory, 6 km from the proposed Scheme, have been used to represent existing conditions at human health receptors, while spatially-averaged (over a 5 km x 5 km grid) modelled values have been used to represent existing conditions at ecological receptors. For both types of receptors, the assessment seeks to quantify total annual mean ammonia concentrations, but no explanation is given as to why different sources of data have been used. The measured value is almost twice the spatially-averaged prediction but, again, no explanation for the large difference between the measurement and the model is offered. If no explanation can be given as to why the modelled value is so much lower than the measurement then it would be worst-case to use the higher of the two figures.

### **PM<sub>2.5</sub> vs Total Particulate Matter**

- 2.28 Paragraph 4.26 of Appendix 7.1 to the PEIR states that the assumption that total particulate matter will be in the PM<sub>2.5</sub> fraction “*will result in the over-estimation of impacts on local PM<sub>10</sub> and PM<sub>2.5</sub> concentrations*”. While it is agreed that the modelling approach is sensible, the available literature evidence<sup>8</sup> is that the assumption is correct rather than precautionary (i.e. it is highly likely that all emitted particulate matter will be both PM<sub>10</sub> and PM<sub>2.5</sub>). Thus, the statement that this assumption will cause the concentrations to be over-estimated is incorrect.

### **Building Wake Effects**

- 2.29 The dispersion model has been run including on-site buildings in order to take account of effects on plume dispersion. Given the potential errors introduced by such modelling, it is best practice to model concentrations both with and without buildings included and to report the maximum of the two sets of results.

### **Changes to Building Massing**

- 2.30 Paragraph 7.41 of Chapter 7 notes that the design of the main building has changed since the modelling was carried out. The air quality modelling should be based on the correct design. The assessment presented in the PEIR is not of the proposed Scheme and is not, therefore sufficient to be able to understand the likely environmental effects.

### **Surface Roughness**

- 2.31 Fixed surface roughness values have been used in the model when it would be much more precise to use a variable surface roughness file within the ADMS model. The authors also appear to be confused regarding the likely effect of surface roughness lengths. For example in Paragraph 4.48

<sup>8</sup> E.g. Buonanno, G., Ficco, G., and Stabile, L. 2009. Size distribution and number concentration of particles at the stack of a municipal waste incinerator. Waste Management 29, 749-755.

of Appendix 7.1, the choice of (uniform) surface roughness length is supported on the basis of it being the minimum value associated with the terrain type. A higher surface roughness value at the dispersion site (as opposed to at the meteorological site) is most likely to give higher concentrations rather than lower concentrations. The argument presented Appendix 7.1 is thus effectively that the modelling has taken a 'best-case' rather than a 'worst-case' approach. Because a best-case approach has been taken to the assessment, the assessment cannot be considered to be robust. Thus the results presented in the PEIR do not allow the likely effects of the Scheme to be understood.

### **Construction Dust**

- 2.32 The PEIR concludes that impacts from dust raised during the construction phase will be not significant (Paragraph 7.159 of Chapter 7). This conclusion is reached on the basis that mitigation measures outlined in section 8.2 of the IAQM guidance on construction dust<sup>9</sup> for a 'medium risk' site will be in place (Paragraph 4.13 of Appendix 7.1). The IAQM guidance outlines various measures to be included; for example Line 12 on Page 25 explains that dust monitoring is 'highly recommended'<sup>10</sup>, with the monitoring locations to be agreed with the Local Authority.
- 2.33 Appendix 4.1 of the PEIR comprises an outline CEMP, but this does not contain a commitment for dust monitoring; noting that monitoring requirements will be confirmed within a subsequent 'detailed CEMP'. However, the conclusions of the construction dust assessment in the PEIR are predicated on this mitigation being in place. Thus, if the subsequent 'detailed CEMP' determines a suite of dust mitigation measures which falls short of the requirements for a 'medium risk' site in the IAQM guidance, then it will, at that time, be evident that the Stage 2 consultation documents were misleading.

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<sup>9</sup> <http://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

<sup>10</sup> Measures are identified as being either 'not required', 'desirable', or 'highly recommended'. Thus, 'highly recommended' represents the highest classification of requirement given in the guidance cited in the PEIR.

### 3 Future Air Quality Assessment

- 3.1 There are multiple instances within the PEIR where the methodology, as described, is not relevant to the results presented. For example, description is given regarding road traffic modelling, but no road traffic modelling results are presented. The methodological description nevertheless provides an indication of the approach which might be taken to future assessment stages. Comments on this methodology are thus provided below.

#### Road Traffic Modelling

- 3.2 Paragraph 4.33 of Appendix 7.1 states that the effects of scheme-related traffic will only be considered close to roads. This is not appropriate. While it is true that well away from roads, road traffic effects are unlikely to be significant on their own, there remains a potential even well away from roads for traffic emissions to combine with stack emissions and thus change the impact description (e.g. if a screening criterion of 1% of the Objective is used, then an increment of 0.9% (from the stack) + 0.1% (from the road) would go from being screened as insignificant to being potentially significant). For a scheme such as this, which will have both traffic and non-traffic emissions, then the combined effects of both sources should be considered at all modelled receptors.
- 3.3 Chapter 7 of the PEIR states that Highways England's Design Manual for Roads and Bridges (DMRB) will be used to screen those roads which require inclusion in the assessment. The DMRB is intended for highways schemes. It is not intended for a development such as this and is not appropriate. In any event, and for the reasons explained in Paragraph 3.2, above, even where the impacts of traffic alone might be considered insignificant, the combined effects of traffic and stack emissions might be considered significant. Any approach which seeks to screening roads out from inclusion based solely on the incremental change in traffic should take account of this.

#### Choice of Worst-case Meteorological Year

- 3.4 Appendix 7.1 suggests that the approach that will be taken will be to determine the single year of meteorological data that gives rise to the maximum impacts at the single worst receptor and use this one year for the isopleths. It is not clear why the isopleths will not take the receptor-specific maxima across all meteorological datasets; which is both worst-case and common practice.

#### Ammonia Monitoring

- 3.5 Chapter 7 of the PEIR describes diffusion tube monitoring for NH<sub>3</sub>. The type of samplers being used is not stated. Ammonia is a difficult gas to measure and certain types of monitor are unlikely

to provide unbiased measurements at typical ambient background concentrations<sup>11</sup>. If the measurements are to be relied upon, details of the monitoring method and its ability to measure at the expected concentration range should be provided.

### Relationships between annual mean and short-term concentrations

- 3.6 Paragraphs 4.71 to 4.76 of Appendix 7.1 present relationships between annual mean and short-term concentrations for PM<sub>10</sub> and NO<sub>2</sub> from road traffic. Given that no road traffic model results are presented in the PEIR, it is difficult to understand precisely how these will be used; particularly with reference to the combined effect of the stack emissions and the road traffic emissions. It should, however, be recognised that the relationships referred to were derived from roadside measurements. Monitors close to industrial emissions were excluded. It is considered appropriate to use them for traffic-related emissions but not for stack-related emissions. There is no suggestion in the PEIR that they will be used incorrectly, it is simply not possible to tell how they will be used from the information provided.

### Abnormal Operations

- 3.7 The PEIR includes an assessment during normal operations only. The IED allows isolated events during which emissions are significantly higher than those which have been modelled. A robust assessment of abnormal operations should be provided before applying for a permit to operate from the Environment Agency.

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<sup>11</sup> There is detailed literature evidence on this point, including comparative evaluations of different sampler types and including common suppliers such as Gradko.  
<https://www.sciencedirect.com/science/article/abs/pii/S1352231018308185>  
<https://www.hindawi.com/journals/tswj/2001/396530/abs/>

## 4 Conclusion

- 4.1 It is clear that the air quality sections of the PEIR are incomplete and thus not sufficient to understand or adequately assess the air quality effects of the Scheme. A recurring issue, throughout many of the topic areas identified in Section 2 of this note, is that the PEIR reaches a conclusion of 'not significant' despite presenting evidence which does not support this conclusion. It is highly concerning that conclusions have been reached and reported prior to the required assessment being carried out. It is recommended that the reported conclusions be disregarded until such time as they can be supported by a robust air quality assessment.

## A1 Professional Experience

### **Dr Ben Marner, BSc (Hons) PhD CSci MEnvSc MIAQM**

Dr Marner is a Technical Director with AQC and has twenty years' experience in the field of air quality. He has been responsible for air quality and greenhouse gas assessments of road schemes, rail schemes, airports, power stations, waste incinerators, commercial developments and residential developments in the UK and abroad. He has been an expert witness at several public inquiries, where he has presented evidence on health-related air quality impacts, the impacts of air quality on sensitive ecosystems, and greenhouse gas impacts. He has extensive experience of using detailed dispersion models, as well as contributing to the development of modelling best practices. Dr Marner has arranged and overseen air quality monitoring surveys, as well as contributing to Defra guidance on harmonising monitoring methods. He has been responsible for air quality review and assessments on behalf of numerous local authorities. He has also developed methods to predict nitrogen deposition fluxes on behalf of the Environment Agency, provided support and advice to the UK Government's air quality review and assessment helpdesk, Transport Scotland, Transport for London, and numerous local authorities. He is a Member of the Institute of Air Quality Management and a Chartered Scientist. Dr Marner is a member of Defra's Network of Evidence Experts and a member of Defra's Air Quality Expert Group.

### **Penny Wilson, BSc (Hons) CSci MEnvSc MIAQM**

Ms Wilson is an Associate Director with AQC, with more than 19 years' relevant experience in the field of air quality. She has been responsible for air quality assessments of a wide range of development projects, covering retail, housing, roads, ports, railways and airports. She has also prepared air quality review and assessment reports and air quality action plans for local authorities and appraised local authority assessments and air quality grant applications on behalf of the UK governments. Ms Wilson has arranged air quality and dust monitoring programmes and carried out dust and odour assessments. She has provided expert witness services for planning appeals and is Member of the Institute of Air Quality Management and a Chartered Scientist.