



**Gravesham Borough Council
Air Quality Peer Review
Lower Thames Crossing – PEIR**

November 2018

Move Forward with Confidence





**BUREAU
VERITAS**

Document Control Sheet

Identification	
Client	Gravesham Borough Council
Document Title	Air Quality Peer Review – Lower Thames Crossing - PEIR
Bureau Veritas Project No.	6481789/AQ/R1

Contact Details		
Company Name	Bureau Veritas UK Limited	Gravesham Borough Council
Contact Name	Jamie Clayton	Tony Chadwick
Position	Principal Consultant (Air Quality)	Acting Planning Policy Manager
Address	2 nd Floor, Atlantic House Atlas Business Park Simonsway, Wythenshawe Manchester M22 5PR	Civic Centre Gravesend Kent DA12 1AU
Telephone	07794 119598	01474 337404
e-mail	jamie.clayton@uk.bureauveritas.com	Tony.chadwick@gravesham.gov.uk
Websites	www.bureauveritas.co.uk	www.gravesham.gov.uk

Configuration				
Version	Date	Author	Reason for Issue/Summary of Changes	Status
1	14/11/2018	J Clayton	Issued to Client	Draft

	Name	Job Title	Signature
Prepared By	J Clayton	Principal Consultant	
Approved By	R Maggs	Consulting Group Manager	

Commercial In Confidence

© Bureau Veritas UK Limited

The copyright in this work is vested in Bureau Veritas UK Limited, and the information contained herein is confidential. This work, either in whole or in part, may not be reproduced or disclosed to others or used for any purpose, other than for internal client evaluation, without Bureau Veritas' prior written approval.

Bureau Veritas UK Limited, Registered in England & Wales, Company Number: 01758622
 Registered Office: Suite 308, Fort Dunlop, Fort Parkway, Birmingham B24 9FD

Table of Contents

1	Introduction	2
2	Methodology	2
3	Peer Review Findings	4
3.1	Scoping	4
3.2	PEIR	9
3.2.1	Baseline	9
3.2.2	Construction Phase	9
3.2.3	Operational Phase	10
4	Conclusions and Recommendations	12

1 Introduction

Bureau Veritas (BV) has been appointed by Gravesham Borough Council (the Council) to peer review the air quality chapter of the Preliminary Environmental Information Report (PEIR) for the proposed Lower Thames Crossing (LTC) road scheme. Highways England (the Applicant) is seeking a Development Consent Order (DCO) for this major highways development, which is partially within the boundary of The Council.

The current proposals for the LTC comprise a new road link (three lanes in each direction) connecting the A2 in Kent, east of Gravesend with the M25, south of junction 29. The highway will pass under the Thames via two 16m diameter tunnels, with a length of approximately 4km. The aim of this new highway connection will be to reduce congestion at the existing Thames crossing (bridge and tunnel) at Dartford.

Construction of the new highway, and all associated junctions and road improvements, is expected to take approximately seven years, with a provisional opening year of 2027.

The primary purpose of this report is to ensure that the preliminary air quality information submitted by the applicant, and subsequently the proposals for further detailed assessment, follows an appropriate methodology and makes reference to – and utilises as far as possible – the custom and practice guidance that is available locally and nationally for such an assessment.

2 Methodology

A number of methodologies can be applied to the peer review of air quality assessments. In brief, the assessment, or proposals for such, should comply with:

- the need to clearly set the defined existing conditions at the Site;
- the extent to which the development is likely to impact on the environment; and
- an assessment of the significance of such impacts as benchmarked against relevant and available criteria.

The whole assessment should be made against prevailing planning policies set by Government, local and regional bodies.

The following primary documents have been reviewed:

- LTC Preliminary Environmental Information Report (2018) - Volume 1 (Chapter 6 Air Quality)
- LTC Preliminary Environmental Information Report (2018) - Volume 2 (Air Quality Appendices A - D)
- LTC Preliminary Environmental Information Report (2018) - Volume 3 (Air Quality Figures 6.1 - 6.2)
- LTC 13a Map book 1: General Arrangements
- LTC 13b Map book 2: Land use plans

The review has also included consideration of information provided by the Applicant within the Environmental Impact Assessment (EIA) Scoping Report (SR) (October 2017) submitted by the Applicant, and the subsequent scoping response issued by the Council (1 December 2017), and the Scoping Opinion issued by the Planning Inspectorate (PINS) (December 2017).

Primary Regulations, standards and best practice guidance referred to in this review include:

- The National Policy Statement for National Networks (December 2014) [NPSNN]
- The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 [EIA Regs]



- The Design Manual for Roads and Bridges, Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 Air Quality HA 207/07
- Local Air Quality Management Technical Guidance (LAQM.TG)(16) issued by the Department for the Environment, Food and Rural Affairs (Defra, 2016)
- IAN 170/12v3 Updated air quality advice on the assessment of future NO_x and NO₂ projections for users of DMRB Volume 11, Section 3, Part 1 'Air Quality, November 2013
- IAN 174/13 Updated advice for evaluating significant local air quality effects for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07), June 2013
- IAN 175/13 Updated advice on risk assessment related to compliance with the EU Directive on ambient air quality and on the production of Scheme Air Quality Action Plans for users of DMRB Volume 11, Section 3, Part 1 Air Quality (HA207/07), June 2013
- IAN 185/15, Updated traffic, air quality and noise advice on the assessment of link speeds and generation of vehicle data into 'speed-bands' for users of DMRB Volume 11, Section 3, Part 1 'Air Quality and Volume 11

The air quality assessment has thus been peer reviewed in order to inform the Council around issues that may constitute the need for:

- any further clarification: namely those issues for which further detail would provide for additional transparency and/or a clearer understanding on; or
- an omission: those issues deemed within the peer review to be lacking within the preliminary assessment which, if not addressed within the subsequent Environmental Statement (ES), may prevent the local planning authority (LPA) from making an informed decision related to the impacts of the proposed development.

3 Peer Review Findings

3.1 Scoping

Table 1 below provides a summary of the comments by the Council within their scoping response, and commentary on whether, and to what extent, these comments have been acknowledged or addressed within the PEIR.

Table 1: Scoping Responses by the Council

Item	Commentary
<p>There is serious concern about the effect of the introduction of a significant new source of pollution on the Borough (particularly at Marling Cross, Thong, Riverview Park and Chalk) as well as the impact on the existing AQMA [Air Quality Management Area] on the A2 because of widening.</p>	<p>Three receptors have been considered at Marling Cross and Riverview Park (PEIR0507, PEIR0112 and PEIR0086). The highest predicted NO₂ concentration in the Do Something (DS) scenario at any of these three receptors is 28.1µg/m³ at PEIR0507, an increase of 0.7µg/m³ from the Do minimum (DM) scenario.</p> <p>Two receptors have been considered at Thong (PEIR0506 and PEIR0078). The highest predicted NO₂ concentration in the DS scenario at either of these two receptors is 18.5µg/m³ at PEIR0078. The maximum increase in NO₂ concentrations between the DM and DS scenarios occurs at PEIR0506 where an increase of 2.9µg/m³ is predicted.</p> <p>Three receptors have been considered at Chalk (PEIR0003, PEIR0526 and PEIR0527). The highest predicted NO₂ concentration in the DS scenario at any of these three receptors is 20.9µg/m³ at PEIR0526. The maximum increase in NO₂ concentrations between the DM and DS scenarios occurs at PEIR0527 where an increase of 3.8µg/m³ is predicted.</p> <p>24 existing receptors have been considered along the A2 AQMA. The highest predicted NO₂ concentration in the DS scenario at any of these receptors is 34.7µg/m³ at PEIR0177. The maximum increase in NO₂ concentrations between the DM and DS scenarios occurs at PEIR0244 where an increase of 5.4µg/m³ is predicted.</p> <p>It is understood that a revised assessment of impacts from emissions from operational road traffic will be presented in the ES using revised traffic inputs. All modelled results presented in the PEIR are therefore subject to change in the final assessment presented in the subsequent ES.</p>

Item	Commentary
<p>It is noted that although nitrogen dioxide NO₂ and particulate matter PM₁₀ are to be modelled and monitored, there is a significant omission of PM_{2.5}, which should be included in the analysis. It is already included in the Public Health Outcomes Framework (PHOF) for Public Health purposes. This should also apply to the analysis of the regional implications (para 6.7.17).</p>	<p>Paragraph 6.3.19 states that whilst the PEIR has not specifically modelled the PM_{2.5} concentration annual mean concentrations are expected to be well below the EU limit value of 25µg/m³ at all receptors. Annual mean PM₁₀ concentrations modelled at receptors in the Do Minimum (DM) and Do Something (DS) scenarios have however been compared to the PM_{2.5} limit value to demonstrate that PM_{2.5} concentrations will be below this threshold.</p> <p>Impacts from PM_{2.5} will therefore be inferred by assuming that PM₁₀ predicted concentrations will remain below PM_{2.5} objective levels. Given the emerging evidence pointing towards exposure to PM_{2.5} having no safe threshold GBC may wish to seek a more complete PM_{2.5} assessment.</p>
<p>Part of the route is within the A2 Trunk Road Air Quality Management Area, and measures should be taken to mitigate any adverse impact on this AQMA during both the construction and operation phase so that air pollution levels do not worsen in the existing AQMA and also so that its area does not need to be expanded.</p>	<p>Impacts from the construction phase of the project have not been considered in the PEIR. Air quality impacts from construction will need to be considered as part of the ES submitted with the DCO application and careful consideration needed to ensure no detriment to air quality during construction arises.</p>
<p>The key test is whether air quality standards are breached at any point on the network.</p>	<p>The results of the PEIR assessment indicate that breaches of the annual mean NO₂ air quality objective will occur at 16 receptor locations in the DS scenario. However all 16 of these receptors are observed to also exceed in the DM scenario. The assessment therefore does not predict that the development will cause and exceedences of air quality objective.</p> <p>It is understood that a revised assessment of impacts from emissions from operational road traffic will be presented in the ES using revised traffic inputs. All modelled results presented in the PEIR are therefore subject to change in the final assessment presented in the subsequent ES.</p>

Item	Commentary																									
<p>6.4.3 - local background monitoring data should be used if the data set shows monitored background levels to be higher than the national background mapping. Again, it would be useful for both to be used for comparison. Some additional monitoring locations are suggested:</p> <table border="1" data-bbox="188 551 782 779"> <thead> <tr> <th>Site Ref</th> <th>Site Type</th> <th>Location</th> <th>Pollutant</th> <th>AQMA</th> </tr> </thead> <tbody> <tr> <td>GR137</td> <td>RS</td> <td>570719, 171143</td> <td>NO₂</td> <td>No</td> </tr> <tr> <td>GR138</td> <td>RS</td> <td>570583, 169549</td> <td>NO₂</td> <td>Yes</td> </tr> <tr> <td>GR141</td> <td>RS</td> <td>569588, 169603</td> <td>NO₂</td> <td>Yes</td> </tr> <tr> <td>GR142</td> <td>RS</td> <td>567500, 169836</td> <td>NO₂</td> <td>Yes</td> </tr> </tbody> </table>	Site Ref	Site Type	Location	Pollutant	AQMA	GR137	RS	570719, 171143	NO ₂	No	GR138	RS	570583, 169549	NO ₂	Yes	GR141	RS	569588, 169603	NO ₂	Yes	GR142	RS	567500, 169836	NO ₂	Yes	<p>Paragraphs 6.3.54 – 6.3.57 details the approach the assessment has taken regarding assumed background concentrations in the model. A comparison between 31 background monitoring sites across the study area with Defra mapped background concentrations has been undertaken. Based on this comparison the Defra mapped background concentrations have been uplifted by a factor of 1.45 for NO₂ for all modelled scenarios. Background PM₁₀ concentrations have not been adjusted from Defra mapped concentrations due to limited background monitoring sites across the study area.</p> <p>The study has therefore not assessed impacts using either local background monitoring or the Defra background maps in isolation but with a single approach which considers both sources.</p> <p>The additional roadside monitoring locations suggested are not considered in the assessment as they were not commissioned until 2017 and the base year of the study (year model verification was undertaken) was 2016. The additional roadside monitoring locations do not appear as modelled receptor locations in the PEIR.</p>
Site Ref	Site Type	Location	Pollutant	AQMA																						
GR137	RS	570719, 171143	NO ₂	No																						
GR138	RS	570583, 169549	NO ₂	Yes																						
GR141	RS	569588, 169603	NO ₂	Yes																						
GR142	RS	567500, 169836	NO ₂	Yes																						
<p>6.6.5 - consideration of the exposure of the vehicle occupants to air pollution should be made in relation to congestion particularly in cuttings and in the tunnel. Mitigation measures must then be included in the design to ensure their exposure does not exceed the EU Limit Values.</p>	<p>Paragraphs 6.3.48 – 6.3. 51 details the human receptors which have been considered in the PEIR air quality assessment. The receptor locations have been chosen based on guidance provided in LAQM.TG(16). This does not include receptors relating to occupants of road vehicles.</p> <p>It is not standard practice for pollutant exposure to occupants of road vehicles to be included within an air quality assessment as the location would not meet this siting criteria for annual mean objectives outlined in Box 1.1 of LAQM.TG(16).</p> <p>Air quality mitigation measures for operational impacts have not been included within the PEIR but should be included within the final Environmental Statement (ES).</p>																									

Item	Commentary
<p>6.7.4 - all reasonable steps should be taken to design the route, the road's construction and intrinsic design and construction so that there are no adverse impacts on any relevant receptor during the operation phase. It is noted that if the tunnels are bored from the south there are significant implications for the Chalk area and any access routes. The impact on the locality through the storage of spoil must be assessed and relevant mitigation measures implemented into the construction phase.</p>	<p>Impacts from the construction phase of the project have not been considered in the PEIR although it is acknowledged that the construction phase of the project has the potential to affect air quality because of emissions of dust, emissions from Non-Road Mobile Machinery (NRMM) and from construction vehicle movements by road, river and rail (para 6.6.3).</p> <p>Air quality impacts from construction will be considered as part of the ES submitted with the DCO application.</p> <p>A Code of Construction Practice (CoCP) will be prepared as part of the ES, which will set out mitigation measures to be implemented during the construction phase.</p>
<p>6.7.5 - disappointingly the Scoping Report states that if there are no sensitive receptors (such as residential properties, schools and designated sites) within 200m of the affected roads then the local air quality effect of the scheme can be considered not significant and no further air quality assessment is required. During heavy congestion, particularly with a high proportion of HGV/HDV vehicles in the queues this is likely to affect an area bigger than 200m. It may also cause breaches of the EU Limit Values. The Scoping Report makes reference to the EU Limit Values in 6.7.10, 6.7.11 and 6.7.16 and confirms that a Compliance Assessment will be undertaken to determine whether the Project will have an impact on compliance with the EU Air Quality Directive. All steps should be taken so as not to cause a breach of the EU Limit Values.</p>	<p>Paragraph 6.3.18 states that pollutant concentrations have been predicted at sensitive receptors within 200m of the Affected Road Network (ARN) in line with the DMRB guidance. The PEIR has not included all roads which trigger the DMRB ARN criteria, however paragraph 6.3.18 states that The ES will provide the modelled results for the full ARN and be fully compliant with DMRB.</p> <p>No sensitive receptors at distances greater than 200m from the ARN have been considered in the PEIR.</p> <p>An indicative Compliance Risk Assessment is detailed in paragraphs 6.6.43 - 6.6.44, however this only considers the maximum predicted concentrations in the Do Something (DS) scenario and the maximum increase in concentrations predicted by the scheme. The indicative assessment concludes that the project is considered to have a low risk of leading to non-compliance with the EU Directive on Ambient Air Quality. A full compliance risk assessment taking into account of all receptors will be undertaken for the ES.</p>
<p>6.8.1 - there is reference to there being some potential for adverse effects during the construction phase and goes on to say that as these are temporary they will be minimised. However, the construction phase is 6 years, and as such the impact is long term, albeit that it may cease at the end of the construction phase. Six years is a significant amount of time and as such any adverse impact during the construction phase should be given due consideration and all reasonable steps should be carried out to mitigate these impacts as far as is possible.</p>	<p>Impacts from the construction phase of the project have not been considered in the PEIR, although it is acknowledged that the construction phase of the project has the potential to affect air quality because of emissions of dust, emissions from Non-Road Mobile Machinery (NRMM) and from construction vehicle movements by road, river and rail (para 6.6.3).</p> <p>Air quality impacts from construction will need to be considered as part of the ES submitted with the DCO application.</p>

Item	Commentary
<p>6.9.5 - Air Quality monitoring should be continued indefinitely after the opening year so that the local authorities, the public and Highways England are aware of the impact on nearby residents and areas of importance e.g. SSSIs [Sites of Special Scientific Interest] etc. and so that any areas of exceedance of the objectives and any AQMA boundaries are kept up to date.</p>	<p>A 12 month project specific monitoring survey has been undertaken as detailed in paragraph 6.3.11. This covered the period from August 2017 to August 2018.</p> <p>The PEIR provides no commitment for any other monitoring.</p> <p>A Code of Construction Practice (CoCP) will be prepared as part of the ES, which will set out mitigation measures to be implemented during the construction phase. It is possible that air quality monitoring will be included within the CoCP, although this is not explicitly stated.</p>
<p>6.9.5 - the provision of buffer zones along the length of the new road should be ensured so as to provide space for air quality mitigation, e.g. bunding, this will assist in the mitigation of noise also. Bunding would also be a good use for left-over spoil.</p>	<p>The PEIR provides no commitment for buffer zones along the road length to provide space for air quality mitigation.</p> <p>A Code of Construction Practice (CoCP) will be prepared as part of the ES, which will set out mitigation measures to be implemented during the construction phase.</p>

3.2 PEIR

3.2.1 Baseline

- a) The baseline conditions have been established within 200m of the ARN as per the DMRB guidance. Annual mean air quality monitoring data for the year 2016 has been obtained from LAQM monitoring locations from 22 local authorities, Highways England historic air quality monitoring sites and project specific air quality monitoring sites. Data collected from local authority sites is made up of both NO₂ diffusion tubes and automatic monitoring sites.
- b) Background NO₂ concentrations have been calculated by undertaking a comparison of monitored background NO₂ and Defra background mapped NO₂ at 31 background monitoring sites across the study area. Based on this comparison Defra mapped concentrations have been uplifted by a factor of 1.45 for all modelled scenarios. Following model verification an uplift in assumed background values from the Defra mapped concentrations will result in a lower component from modelled road sources, which in turn will result in a smaller change in NO₂ concentrations between the DM and DS scenarios. It is therefore necessary that any uplift to background concentrations is subjected to the correct level of scrutiny to ensure it is appropriate across the full extent of the study area.
- c) All air quality monitoring data utilised presently in the PEIR has been collected in, or adjusted to, the year 2016. It is assumed that 2016 will remain the base year of assessment in the revised air quality assessment to be presented in the ES. It is not clear how the revised assessment will therefore take into account any changes in monitored concentrations between 2016 and 2018. Additionally it is not clear if the revised assessment will consider the use of any monitoring sites commissioned after 2016 such as sites GR137, GR138, GR141 and GR142 commissioned by GBC in 2017. It may therefore be appropriate for the revised version of the modelling assessment presented in the ES to consider a later base year of 2017 or 2018.

3.2.2 Construction Phase

Construction Dust Assessment

- a) PEIR Vol 1 para 6.6.3 details that although the project has the potential to affect air quality due to emissions from construction dust, these effects have not been considered in the PEIR. It is further stated that they will be considered as part of the ES to be submitted with the DCO application.
- b) An appropriate assessment of construction dust should be included as part of the ES utilising guidance such as the [Institute of Air Quality Management: Guidance on the assessment of dust from demolition and construction \(2014\)](#). Following the construction dust assessment, appropriate mitigation measures should be outlined to inform the Code of Construction Practice (CoCP) to be submitted as part of the ES. A list of mitigation measures that will be considered is provided following PEIR Vol 1 para 6.6.4, this broadly follows the types of measures outlined in the IAQM guidance and so is considered appropriate subject to the further assessment.

Construction Emissions from Non-Road Mobile Machinery

- c) PEIR Vol 1 para 6.6.3 details that although the project has the potential to affect air quality due to emissions from Non-Road Mobile Machinery (NRMM), these effects have not been considered in the PEIR. It is further stated that they will be considered as part of the ES to be submitted with the DCO application.
- d) An appropriate assessment of NRMM emissions should be included as part of the ES where appropriate taking into account the requirements of the London NRMM standards as outlined in the Mayor of London's [The Control of Dust and Emissions during Construction and Demolition SPG](#).

Construction Emissions from vehicle movements on road, river and rail.

- e) PEIR Vol 1 para 6.6.3 details although the project has the potential to affect air quality due to emissions from construction vehicle movements by road, river and rail, that these effects have not been considered in the PEIR, but that they will be considered as part of the ES.
- f) An appropriate assessment of emissions from construction traffic should be undertaken. As no traffic figures or detailed construction phasing have been provided it is not possible to indicate what an appropriate assessment method would be. GBR comments provided in the scoping report have indicated that as the construction phase will be 6 years it is not appropriate for construction impacts to be considered as temporary. Additionally, as the construction period will occur before the assessment year of 2026, less of a shift to cleaner vehicles will have occurred and so a greater impact is likely to occur than if construction traffic was assessed for the year of 2026. It may therefore be appropriate for the assessment of emissions from construction road vehicles to consider the earliest possible year of peak construction.
- g) As no details of the required construction vehicle movements for river or rail is provided it is not possible to indicate what an appropriate impact assessment method would be. Where appropriate, however, impacts of emissions from vehicle movements from river and rail should be included in the ES submitted as part of the DCO, or suitable justification provided for their exclusion.

3.2.3 Operational Phase

Emissions from Roads Vehicle Movements

- a) It is understood that a revised assessment of impacts from emissions from operational road traffic will be presented in the ES. The assessment presented in the PEIR therefore only provides an indication of assessed impacts at key receptors. Due to the fact that all modelled results are likely to change in the ES assessment submission this review has focused on the proposed assessment methodology, rather than the preliminary results at specific receptors.
- b) The air quality modelling assessment presented in the PEIR has utilised base data for the year 2016 and assumed an operational assessment year of 2026. As pollutant concentrations are in general expected to show a marginal decrease year on year, 2026 is considered an appropriate assessment year in light of the current provisional opening year of 2027.
- c) Key changes to traffic to the South of the River Thames are presented in para 6.6.12. Of particular pertinence to GBC are points d, e and f. Traffic data presented in PEIR Vol 1 chapter 6, presented as Annual Average Daily Traffic (AADT), have been rounded to the nearest 1000 vehicles. AADT traffic flows have only been presented at key receptor locations in the PEIR but it is acknowledged that full traffic data will be made available in the ES submitted with the DCO application.
- d) Although it has not been possible to consider fully traffic data changes at receptors as part of this review there appears to be an error in Table 6.15 in relation to receptor PEIR0023. The tables seems to suggest that an increase in traffic of "<100" results in a decrease in NO₂ concentration from 68µg/m³ to 66.7µg/m³.
- e) GIS traffic data files have been made available for review with the PEIR submission however this data is only for peak hours, and only for future year (2026) scenarios. In order to effectively review the air quality modelling results, and confirm that all appropriate receptor locations have been included, 24 hour AADT data should be made available for both base year (2016) and future year scenarios.
- f) PEIR Vol 1 para 6.3.43 – 6.3.45 provides detail on the road traffic emission factors which the air quality assessment has for NO₂ and PM₁₀. The study has utilised emission factors derived from an update to the speed band emission factors published in the Highways England (HE) Interim Advice Note (IAN) 185/15. These factors were released following the publication of the latest version of the Defra's Emissions Factors Toolkit (EFT). Uncertainty in future year NO₂ projections has been considered by utilising the methodology outlined in HE IAN 170/12 v3. The method outlined in the IAN 170/12 involves undertaking NO₂/NO_x gap analysis, based on

the adjustment of modelled NO₂/NO_x for both the 2026 DM and 2026 DS scenarios. Para 6.3.61 states that *“although the IAN 170/12 was released prior to the latest version of Defra’s EFT it has still been utilised in the air quality assessment as it provides more pessimistic modelled concentrations than relying solely on Defra modelling tools”*. The assessment therefore does not make use of the latest COPERT emissions factors and modelling tools provided by Defra but seeks to provide more pessimistic predictions for future year scenarios through use of the gap analysis. As the Defra modelling tools have been updated a number of times since the release of HE IAN 170/12 further analysis should be presented to verify the statement that its use still represents a more pessimistic approach.

- g) 185 roadside diffusion tube and automatic monitoring sites have been used for the purpose of model verification. Table B4 in PEIR Vol 2 provides model verification factors for 13 zones across the modelled area. These factors range from 0.97 (a model over prediction) at the A127 Junction to 5.92 (a large model under prediction) at Dartford urban gradient. Although the table provides the number of receptors and verification points associated with each of the verification zones the data presented in the PEIR does not detail which receptors and verification points are linked to which zones. It has therefore not been possible to undertake a full analysis of model verification using the data presented as part of the PEIR submission, so whilst the method presented is in agreement with that presented in LAQM.TG(16) it cannot presently be tested fully.
- h) Other than the mention of the Dartford urban gradient zone in Table B4 of PEIR Vol 2 the assessment does not make any reference as to how emissions from vehicles on roads of different gradients have been considered in the assessment. LAQM.TG(16) para 7.250 onwards provides a methodology for considering changes in emissions from vehicles on roads of different gradients. The impact of different road gradients on pollutant emissions should be considered in the revised assessment to be presented in the ES.

Compliance Risk Assessment

- i) An indicative Compliance Risk Assessment is detailed in PEIR Vol 1 paras 6.6.43 - 6.6.44, however this only considers the maximum predicted concentrations in the Do Something (DS) scenario and the maximum increase in concentrations predicted by the scheme. The indicative assessment concludes that the project is considered to have a low risk of leading to non-compliance with the EU Directive on Ambient Air Quality. A full compliance risk assessment taking into account of all receptors will be undertaken for the ES.

4 Conclusions and Recommendations

Bureau Veritas have undertaken a review of the air quality assessment presented within the PEIR. As the air quality assessment presents only initial results, which are subject to change in submission of the final ES this review has focused mainly on the methodology detailed, rather than results predicted at individual receptors.

As complete traffic data has not been provided it has not been possible replicate results or to test the model verification method applied or to confirm that all appropriate receptor locations have been assessed. Due to the large model domain and complex nature of the zoned verification it is requested that more information around model verification is provided. Although the assessment does not make use of the Defra air quality modelling tools the assessment has been undertaken following the method outlined in the DMRB guidance supplemented by the use of several HE IANs. Further validation of this method is recommended to confirm that future year assessment predictions are not less conservative than if the assessment had utilised the Defra modelling tools which incorporate the latest COPERT emission factors.

The initial assessment provides no consideration to varying of vehicle emissions on roads of different gradients or provides no commentary on how any changes in monitored concentrations from 2016 to 2018 will be captured within the assessment.

The assessment as presented in the PEIR provides no assessment of construction impacts although this should be provided in the ES submitted as part of the DCO application.