

## TECHNICAL NOTE

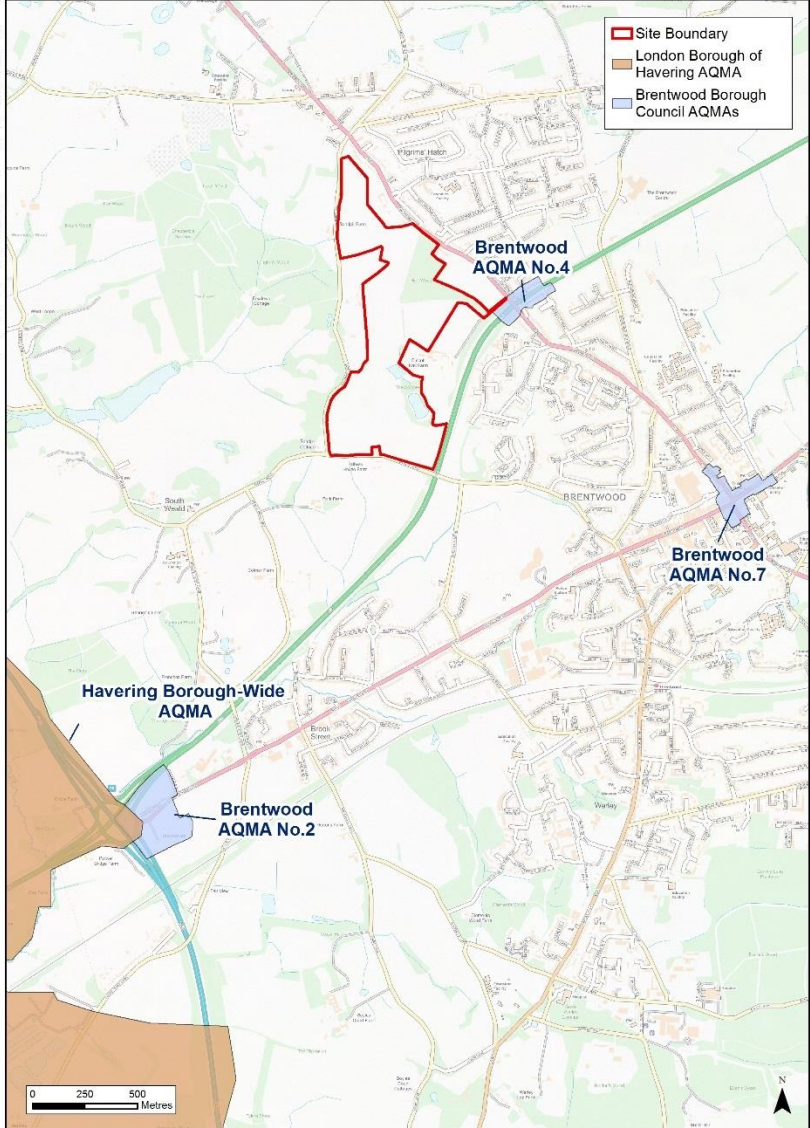






**Job Name:** Calcott Hall Farm, Brentwood  
**Job No:** 42579  
**Note No:** 3002/TN001  
**Date:** 8 February 2019  
 (Rev C – 4 March 2019)  
**Prepared By:** Laura Smart  
**Subject:** Preliminary Air Quality Review

Item	Subject
1.	<p><b>Introduction</b></p> <p>Peter Brett Associates (PBA), now part of Stantec, has been commissioned to undertake a desktop review of the likely air quality constraints associated with the proposed residential development for approximately 800 dwellings on land at Calcott Hall Farm, south of Ongar Road Brentford.</p> <p>The site has a total area of approximately 47.6ha and is bounded by the A128 Ongar Road to the north, the A12, to the east, Weald Road to the south and Sandpit Lane to the west.</p> <p>The complex of existing farm buildings and some surrounding land will be excluded from the proposed development and will also form part of the eastern boundary of the development site. To the north and east of the site are the existing residential areas of Pilgrims Hatch and Brentwood. The site is largely surrounded by agricultural fields to the south and west. There is an area of designated ancient woodland, High Wood, to the northeast of the site, adjacent to Ongar Road.</p> <p>The land is currently arable farm land with some woodland and lakes. The highest point is within the centre of the site, which slopes gently to the north and more steeply to the south east.</p> <p>The proposed development is indicated on fpcr drawing 8363-L-01 contained in Appendix A. The site will have an access road running north-south through the site (Community Link Road) giving access to the residential development parcels, and over 50% of the overall development site area will be “Green Infrastructure”.</p>

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2.	<p><b>Air Quality Objectives</b></p> <p>The National Air Quality Objectives (NAQOs) for nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>) set out in the Air Quality Regulations (England) 2000 and the Air Quality (England) (Amendment) Regulations 2002 have been designed for the protection of human health. These objectives are shown in Table 1.</p> <p>In addition, the Air Quality Strategy for England, Scotland and Wales 2007, includes an exposure reduction target for smaller particles known as PM<sub>2.5</sub>. These are an annual mean target of 25 µg/m<sup>3</sup> by 2020 and an average urban background exposure reduction target of 15% between 2010 and 2020.</p> <p><b>Table 1: NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> Objectives</b></p> <table border="1" data-bbox="373 696 1442 1070"> <thead> <tr> <th>Pollutant</th> <th>Time Period</th> <th>Objective</th> </tr> </thead> <tbody> <tr> <td rowspan="2">NO<sub>2</sub></td> <td>One-hour mean</td> <td>200 µg/m<sup>3</sup> not to be exceeded more than 18 times a year</td> </tr> <tr> <td>Annual mean</td> <td>40 µg/m<sup>3</sup></td> </tr> <tr> <td rowspan="2">PM<sub>10</sub></td> <td>24-hour mean</td> <td>50 µg/m<sup>3</sup> not to be exceeded more than 35 times a year</td> </tr> <tr> <td>Annual mean</td> <td>40 µg/m<sup>3</sup></td> </tr> <tr> <td rowspan="2">PM<sub>2.5</sub></td> <td>Annual mean</td> <td>25 µg/m<sup>3</sup></td> </tr> <tr> <td>3-year running annual mean</td> <td>15% reduction in concentrations measured at urban background sites.</td> </tr> </tbody> </table> <p>Analysis of long-term monitoring data suggests that if the annual mean NO<sub>2</sub> concentration is less than 60 µg/m<sup>3</sup>, then the one-hour mean NO<sub>2</sub> objective is unlikely to be exceeded, where road transport is the main source of pollution.</p>	Pollutant	Time Period	Objective	NO <sub>2</sub>	One-hour mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	Annual mean	40 µg/m <sup>3</sup>	PM <sub>10</sub>	24-hour mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	Annual mean	40 µg/m <sup>3</sup>	PM <sub>2.5</sub>	Annual mean	25 µg/m <sup>3</sup>	3-year running annual mean	15% reduction in concentrations measured at urban background sites.
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3.	<p><b>Local Air Quality Management</b></p> <p>Brentwood Borough Council (BBC) has declared three Air Quality Management Areas (AQMAs) for exceedances of the annual mean NO<sub>2</sub> objective. The closest AQMA to the development site is AQMA No.4, directly adjacent to the northeast corner of the site, shown in Figure 1. AQMA No.4 encompasses an area covering Hurstwood Avenue, Warescot Road, and a section of Ongar Road and the A12.</p> <p>In addition, AQMA No.7 is located approximately 1.3 km southeast of the site, and covers an area around the A128 and A1023 High Street junction. AQMA No.2 is located 1.9 km southwest of the site, and covers a part of Brook Street and the A12, adjacent to the M25. The London Borough of Havering has also declared a borough-wide AQMA, approximately 2.2 km from the site.</p>  <table border="1" data-bbox="534 1836 1348 1921"> <tr> <td rowspan="4">   </td> <td>Service Layer Credits:</td> <td>1:20,000 @ A4</td> <td rowspan="4"> <b>Calcott Hall Farm, Brentwood</b>                  AQMA Locations                  Figure 2    Rev A             </td> </tr> <tr> <td>Contains Ordnance Survey Data © Crown Copyright and Database Right 2019</td> <td>20/02/2019</td> </tr> <tr> <td>Drawn: LS</td> <td></td> </tr> <tr> <td>Checked: JK</td> <td></td> </tr> </table>	 	Service Layer Credits:	1:20,000 @ A4	<b>Calcott Hall Farm, Brentwood</b> AQMA Locations Figure 2    Rev A	Contains Ordnance Survey Data © Crown Copyright and Database Right 2019	20/02/2019	Drawn: LS		Checked: JK	
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**Figure 1: Brentwood Borough Council and London Borough of Havering AQMAs**

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4.	<p data-bbox="370 302 734 331"><b>Local Air Quality Monitoring</b></p> <p data-bbox="370 362 1465 515">BBC operates one automatic monitoring site in the Borough, however this is located 1.7 km from the development site. The Council also operates a network of 35 passive (diffusion tube) monitors. The closest monitoring location to the development site is BRW 22, at 339 Ongar Road, approximately 57 m from the site boundary. Measured concentrations for the closest monitoring locations (shown in Figure 2) are presented in Table 2.</p> <div data-bbox="526 555 1348 1765"> <table border="1" data-bbox="539 1680 1343 1765"> <tr> <td data-bbox="539 1680 837 1765"> </td> <td data-bbox="837 1680 1013 1765">                 Service Layer Credits:                  Contains Ordnance Survey Data © Crown Copyright and Database Right 2019             </td> <td data-bbox="1013 1680 1236 1765">                 1:7,000 @ A4                  20/02/2019                  Drawn: LS                  Checked: JK             </td> <td data-bbox="1236 1680 1343 1765"> <b>Calcott Hall Farm, Brentwood</b>                  Brentwood Borough Council AQMA No.4 and Monitoring Locations                  Figure 2 Rev A             </td> </tr> </table> </div>		Service Layer Credits: Contains Ordnance Survey Data © Crown Copyright and Database Right 2019	1:7,000 @ A4 20/02/2019 Drawn: LS Checked: JK	<b>Calcott Hall Farm, Brentwood</b> Brentwood Borough Council AQMA No.4 and Monitoring Locations Figure 2 Rev A
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**Figure 2: Brentwood Borough Council Nearby Monitoring Locations**



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NO<sub>2</sub> annual means &gt;60 µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> hourly mean National Air Quality Strategy objective are shown in bold and underlined</p> <p>Measured concentrations at the closest monitoring location to the development site, BRW 22, have been below the annual mean NO<sub>2</sub> objective over the past five years. Measured concentrations at the majority of the remaining monitoring locations have also been below the annual mean objective, with the exception of BRW 20 and BRW 23 in 2013, and BRW 37 between 2013 and 2017. As measured annual mean concentrations at BRW 37 exceeded 60 µg/m<sup>3</sup> between 2013 and 2017, this is an indication that the hourly mean NO<sub>2</sub> objective was also exceeded during these years. However, BRW 37 is not a representative location for public exposure as members of the public are not expected to be present at that location over the course of the hourly and annual averaging periods and is not representative of conditions within the development site.</p> <p>In addition to these measured concentrations, background concentrations for the site have been obtained from the national maps provided by Defra. Background concentrations for the site are presented in Table 3. The estimated background concentrations are all well below the relevant objectives. <b>Table 3: Estimated Annual Mean Background Concentrations in 2017</b></p> <table border="1"> <thead> <tr> <th rowspan="2" style="background-color: #003366; color: white;">Grid Square</th> <th colspan="4" style="background-color: #003366; color: white;">Annual Mean (µg/m<sup>3</sup>) in 2017</th> </tr> <tr> <th style="background-color: #003366; color: white;">NO<sub>x</sub></th> <th style="background-color: #003366; color: white;">NO<sub>2</sub></th> <th style="background-color: #003366; color: white;">PM<sub>10</sub></th> <th style="background-color: #003366; color: white;">PM<sub>2.5</sub></th> </tr> </thead> <tbody> <tr> <td>557_194</td> <td>17.4</td> <td>12.8</td> <td>14.4</td> <td>9.7</td> </tr> <tr> <td>557_195</td> <td>16.5</td> <td>12.2</td> <td>14.5</td> <td>9.8</td> </tr> <tr> <td>558_194</td> <td>24.2</td> <td>17.3</td> <td>17.5</td> <td>11.5</td> </tr> <tr> <td>558_195</td> <td>19.5</td> <td>14.3</td> <td>15.6</td> <td>10.7</td> </tr> <tr> <td><b>Objectives</b></td> <td style="text-align: center;">-</td> <td style="text-align: center;"><b>40</b></td> <td style="text-align: center;"><b>40</b></td> <td style="text-align: center;"><b>25</b></td> </tr> </tbody> </table>						Site ID and Location	Site Type	Annual Mean (µg/m <sup>3</sup> )					2013	2014	2015	2016	2017	BRW 19 – 61, Warescot Rd	R	33.1	26.7	26.1	29.6	29.2	BRW 20 – 76, Warescot Rd	K	<b>43.6</b>	28.0	31.5	39.0	36.6	BRW 21 – 316 Ongar Rd	R	29.6	23.9	23.6	26.5	27.1	BRW 22 – 339 Ongar Rd	R	38.3	33.0	31.6	35.1	34.5	BRW 23 – 12 Hurstwood Av.	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5.	<p><b>Site Evaluation</b></p> <p>There are three air quality issues that could potentially arise from the proposed development:</p> <ul style="list-style-type: none"> <li>• the impact of the development during the construction phase;</li> <li>• the impact of the development on local air quality during the operational phase, particularly on the three Brentwood AQMAs and High Wood, an area of designated ancient woodland.</li> <li>• the impact of existing emission sources on the site, in particular local road traffic emissions from the A12, A128 Ongar Road and Weald Road.</li> </ul> <p>The main potential effects during construction are dust deposition and elevated PM<sub>10</sub> concentrations. Construction dust impacts will be assessed at a range of worst-case receptor locations which will include High Wood and existing residential properties closest to the development. Typically, construction dust impacts can be controlled through a suite of mitigation measures implemented through a Construction Environmental Management Plan (CEMP). Following mitigation, the residual impacts are unlikely to be significant.</p> <p>The impacts of the development on local air quality will also be assessed at a range of worst-case receptor locations. For traffic-related impacts, these will be the existing residential properties that are closest to roads, in particular those closest to junctions, where traffic emissions are greatest. Dispersion modelling will be used to identify whether traffic from the development would significantly affect worst-case receptor locations in the surrounding area, particularly within the Brentwood AQMAs. Where significant adverse impacts are identified, mitigation measures to reduce these impacts will be recommended. The current development proposals already include a number of measures that will reduce the impact of development traffic on air quality in the local area, such as the preparation of a Travel Plan to reduce the number of vehicle trips made to and from the site, and to promote sustainable forms of transport. In addition, the delivery of a Community Link Road (CLR) through the site will provide an alternative route for vehicles travelling towards the M25 J28 via the A1023 High Street, which forms part of AQMA No.7. The Development related traffic is considered in more detail in the Transport Feasibility Study also prepared by PBA in support of this proposed development.</p> <p>For impacts of existing emission sources on future residential properties within the site, the masterplan layout will ensure that the proposed properties are located sufficiently far from the roads adjacent to the site boundary so as not to be adversely affected by road traffic emissions. Dispersion modelling will be used to confirm that the separation distance between proposed residential properties and the adjacent road sources is sufficient. The current Capacity Plan for the site shows that proposed residential development parcels will be located approximately 70m from the A12 and more than 100 m from AQMA No.4. At these distances, the impact of existing emissions sources on future residential properties within the site are unlikely to be a significant issue. In addition, there is sufficient space within the overall 47.6ha development site for the development parcels to be located such that impacts from existing emissions sources should not impede the development of the site.</p> <p>High Wood is located approximately 20 m from the northern site access road via Ongar Road. At this distance, High Wood is located at a sufficient distance so as not to be adversely affected by emissions from the northern access road. High Wood is also located directly adjacent to Ongar Road. However, this area of High Wood is already likely to be impacted by emissions from this road source and therefore is less likely to be sensitive to increases in road traffic emissions on Ongar Road from the development.</p>

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6.	<p><b>Conclusion</b></p> <p>This note provides details relating to the likely air quality impacts which may influence key design constraints to the proposed development.</p> <p>Air quality is not considered to be a constraint to the development as sensitive elements of the development will be located away from areas where air quality is poor. In addition, mitigation measures designed to reduce the number of vehicle trips made to and from the site, and through the AQMAs already form part of the proposals. With these mitigation measures in place, the impacts of road traffic emissions associated with the development are unlikely to be significant.</p> <p>It is recommended that air quality dispersion modelling is undertaken at the planning application stage to quantify the potential air quality impacts of the development and to determine the extent of any mitigation measures. In addition, dispersion modelling will be used at the planning application stage to confirm the suitability of the site for residential development.</p>

### DOCUMENT ISSUE RECORD

Technical Note No	Rev	Date	Prepared	Checked	Reviewed (Discipline Lead)	Approved (Project Director)
42579/3002/TN001	-	08.02.19	LS	JK	PE	RSH
	A	25.02.19	LS	PE	PE	RSH
	B	28.02.19	PE		PE	RSH
	C	04.03.19	LS	PE	PE	RSH

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## TECHNICAL NOTE

Appendix A

fprc drawing 8363-L-01 – Initial Capacity Plan





**NOTES**  
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- KEY**
- Site Boundary 47.6ha
  - Potential Residential (up to 800 dwellings. Orange dashed line shows 1.8ha plot for potential Primary School)
  - P Parking for Weald Country Park
  - Potential Formal Open Space (includes Green Corridors, Structural Planting, Existing Woodland, Existing Lakes, SUDS, Allotments and Multi-Functional Open Space)
  - Play Potential Equipped Play Area (LEAP)
  - Potential Site Access (P = Primary, e = Emergency)
  - Potential Community Link Road
  - Potential Circulation Routes
  - Potential Pedestrian / Cycle Routes
  - Retained Trees and Hedgerow Planting
  - Retained Ponds
  - Potential Structural Planting
  - Potential Attenuation Basins