

Air Quality Technical Note  
Hampstead Police Station  
4<sup>th</sup> September 2019  
AQ106285c1

## **1.0 – AIR QUALITY TECHNICAL NOTE - PRIMARY SCHOOL AT THE FORMER HAMPSTEAD POLICE STATION (2019/2375/P)**

REC have been requested to provide a formal response to objections raised by Katherine Frost (via email) Senior Sustainability Officer (Planning), London Borough of Camden, on 28<sup>th</sup> June 2019 and further comments received on 9<sup>th</sup> July 2019 (via email).

REC have provided the following responses based on the findings of the 'Air Quality Assessment, Hampstead Police Station AQ106285R1' was undertaken for the proposed development which has been supplemented by "Air Quality Monitoring Report AQ106285-2'.

## **2.0 COMMENTS AND RESPONSES**

The following sections detail the responses to each relevant comment relating to air quality.

### **2.1 Issue 1**

#### **2.1.1 Comment**

Monitoring was only carried out for 3 months. Action: At least 6 months of continuous monitoring should be undertaken. Further information required.

#### **2.1.2 Response to Comment**

Air Quality Assessment, Hampstead Police Station AQ106285R1' presents the results of a modelling exercises which underwent a verification process which follow the methodology contained within IAQM and EPUK guidance LLAQM (TG16) using annual monitoring datasets. The 3-month monitoring was undertaken to confirm the assumptions of the modelling exercise. It is considered that the modelling results present a highly conservative estimation of pollutant concentrations across the site. Comparison shows that the monitored concentrations are less than the modelled predictions. This indicates that the predictions in the assessment represent a robust estimate of annual mean NO<sub>2</sub> concentrations at the development site.

### **2.2 Issue 2**

#### **2.2.1 Comment**

The 3<sup>rd</sup> month included the 2+ week Easter holidays – where a noticeable drop in pollution is seen therefore the lower readings may have been affected by different traffic in the school holidays than during term time. These lower readings reduced the averages. Action: Due to the occupation periods of the school, reductions during school holidays should be considered when interpreting the results.



Further information required

### **2.2.2 Response to Comment**

The monitoring data provided is representative of an annual average concentration. National air quality objectives are set as annual averages to take into account the variability in exposure over time. The results presented have been annualised and bias corrected in line with TG(16) methodology and guidance and is considered to provide a representation of pollutant concentrations in line with current industry practice.

## **2.3 Issue 3**

### **2.3.1 Comment**

Diffusion tubes monitor an average across a period, covering nights and weekends when pollution may be lower whereas a school is occupied during the week days when pollution is likely to peak. Action: This should be considered when interpreting the data. Further information required.

### **2.3.2 Response to Comment**

It is noted that diffusion tubes cannot be used to interpret for short term concentrations. The monitoring report does not attempt to compare to short term averaging periods. It is typically impractical to install a reference equivalent monitoring station, to take into account short term variability in pollutant concentrations, on a project basis. Instead, a modelling exercise supported by bias adjusted monitoring data has been used determine concentrations across the application site. Reference should be made to 'Air Quality Assessment, Hampstead Police Station AQ106285R1' which has been submitted in conjunction with the planning application. The air quality assessment predicted annual mean NO<sub>2</sub> concentrations to range from 34.34 – 40.03 µg/m<sup>3</sup> at the location of the proposed outdoor space (playground). As stated in LLAQM (TG16) if annual mean NO<sub>2</sub> concentrations are below 60 µg/m<sup>3</sup> then it is unlikely that the 1-hour AQO will be exceeded. As such based on the results it is not predicted that concentrations will exceed the 1 hour mean AQO for NO<sub>2</sub> across the development site.

## **2.4 Issue 4**

### **2.4.1 Comment**

Photos of the diffusion tubes were provided of the monitors at the development site but not for the co-location at the Camden Kerbside Automatic monitoring station. The co-located diffusion tubes seem to be in close proximity to a bus stop which could affect the readings. From the map evidence provided this co-location is not suitable to provide an accurate Bias adjustment factor. Action: Further evidence of the co-location tubes required. If not within 1m of the inlet of the automatic monitoring station the results are not considered valid. Further information required.

### **2.4.2 Response to Comment**

The colocation monitoring station used for bias adjustment was the closest automatic site, Camden Kerbside (located at NGR: 526633, 184390) approximately 1.1km south of the development site as indicated in 'Figure 2 within Appendix II'. There appears to be an error in the report and two, 'Figure 2' have been presented. The second 'Figure 2', referred to by the Sustainability officer is not relevant for this project and should be disregarded, we apologise for any confusion that may of occurred. The



first 'Figure 2' is however correct and displays the correct location of the Camden monitoring station used for co-location.

With regards for evidence of co-location please Plate 1 for images of the collocated diffusion tubes. It should be noted that there are several sets of diffusion tubes at the station as it appears to be used frequently for co-location. It is further noted that Camden was contacted with regard to the suitability of using this location and no objections were raised.

**Plate 1 – Diffusion Tube Col-locations with Camden monitoring station**



**2.5 Issue 5 (also see Issue 9 in conjunction)**

**2.5.1 Comment**

The application is for a Primary school. For younger years in the school there is usually free access to outside space. The report notes that Reception, Year 1 and year 2 classrooms would be on the ground floor, presumably for this purpose. Therefore exposure to outside air is unlikely to be limited to playtimes. Action: If a revised assessment concludes that the Air Quality Objective is exceeded then further information is required on the playground exposure. Further information required.

**2.5.2 Response to Comment**

Air Quality Assessment, Hampstead Police Station AQ106285R1' considered detailed dispersion modelling which indicated that classrooms on the proposed lower ground floor (Reception, Year 1 and Year 2) may be exposed to concentrations of NO<sub>2</sub> between 5% below or above the annual mean AQO, and were subsequently classified as APEC – B. As such it is proposed to include mechanical ventilation within the building design for the Reception, Year 1 and Year 2 classrooms across the proposed ground floor level. The air inlet should be located at the highest and farthest from the road possible location in an area with NO<sub>2</sub> concentrations below 38 µg/m<sup>3</sup>. Alternatively, the air inlet can be located at lower



levels, at areas above  $38 \mu\text{g}/\text{m}^3$ , if required by design, providing a NO<sub>x</sub> filtration system is included to the ventilation system. Additionally, a high specification of air tightness on the windows and doors should be incorporated at the Reception, Year 1 and Year 2 classroom facades across ground floor level. The high specification of air tightness will also ensure the classrooms will be well ventilated by the mechanical ventilation system.

## **2.6 Issue 6**

### **2.6.1 Comment**

As set out in the Mayor's Sustainable design and construction SPG April 2014 "Where individual and/or communal gas boilers are installed in commercial and domestic buildings they should achieve a NO<sub>x</sub> rating of <40 mgNO<sub>x</sub>/kWh.

### **2.6.2 Response to Comment**

It is confirmed that the all boilers to be installed will be low NO<sub>x</sub> boilers with a maximum NO<sub>x</sub> rating of 40 mgNO<sub>x</sub>/kWh.

## **2.7 Issue 7**

### **2.7.1 Comment**

The text states that 2016 emission factors have been utilised for the predicted pollution levels however the maps in Appendix 1 refer to predicted annual mean for 2022. ACTION: Further information required to confirm the maps are based on the 2016 emission factors.

### **2.7.2 Response to Comment**

Appendix II of the AQA provides clarification on assessment input data where it states "...2016 emission factors have been utilised for the prediction of pollution levels for all scenarios in preference to the development opening year in order to provide a robust assessment..... Similar, to emission factors, background concentrations for 2016 were utilised in preference to the development opening year of 2022. This provided a robust assessment and is likely to overestimate actual pollutant concentrations during the operation of the proposals". This is considered a highly conservative approach to modelling. The only difference between the 2016 and 2022 scenarios relate to change in traffic volume (increase) again stated in Appendix II where "Growth factors provided by the Trip End Model Presentation Program (TEMPRO) software package were utilised to allow for conversion from the obtained 2013 traffic flow year to 2016, for model verification, and to 2022 which was used to represent the operational year of the proposed development."

## **2.8 Issue 8**

### **2.8.1 Comment**

Mitigation is referred to for the Ground floor level in the AQA however the proposal in the Design and access Statement page 31 indicates that the Reception and Year 1 and year 2 classrooms will be on the Lower ground floor. ACTION: Clarification required of the concentrations at the Lower Ground floor level.

### **2.8.2 Response to Comment**

The AQA should state 'lower ground' where mitigation is proposed for classrooms instead of 'ground'. For further clarification the modelling assessment reports concentrations at a height (z) of 1.5m. This is considered to be representative of the physical ground or road level. 1.5m and of the



height of the Lower Ground Floor. 1.5m is a standard assessment height and represents the breathing space of human receptors. It also avoids modelling errors associated with modelling at a height of 0m.

## **2.9 Issue 9**

### **2.9.1 Comment**

The results show the annual mean. It is noted that the operational hours and therefore exposure hours will not be at night or weekends when traffic is usually lighter and therefore pollution reduces. Further by only mechanically ventilating part of the building the pollution is likely to migrate from areas which are not mitigated. As such the application should seek to go beyond the bare minimum and any mitigation should be maximised. ACTION: Windows should be non-opening and air tight, all areas should be ventilated by mechanical ventilation with the air inlets away from busy roads and as close to roof level as possible and with a NO<sub>x</sub> filtration system. The details should be secured through a condition.

### **2.9.2 Response to Comment**

It is proposed to provide Mechanical Ventilation with Heat Recovery (MVHR) units within the lower ground, ground, 1st and 2nd floors. Air intake will be from the 1st floor roof area, through external weather louvre(s), which will supply air to the lower ground, ground and 1st floor MHVR units. In line with the air quality assessment, modelling results at the location of the 1st floor supply louvre(s) are anticipated to have annual mean NO<sub>2</sub> concentrations between 34-36 µg/m<sup>3</sup> which is categorised as APEC-A or >5% below the national objective. Locating air supply intakes in this area removes the requirement to install NO<sub>x</sub> filtration technology into the intake ducting of the MHVR. In addition, the lower ground and ground floor windows along the Rosslyn Hill façade will be non-opening with no trickle ventilation and achieve a low air permeability. This combined with the slight negative pressure from MHVR will aid provision of air throughout the lower, ground and 1st floors. There is no provision to provide MHVR to additional floors as they are categorised as being APEC-A.

## **2.10 Issue 10**

### **2.10.1 Comment**

The application is for a Primary school. For younger years in the school there is usually increased access to outside space and therefore exposure to outside air is unlikely to be limited to 'playtimes'. The report notes that Reception, Year 1 and year 2 classrooms would be on the ground floor, presumably for this purpose. ACTION: Further information required on screening of reception playground area to minimise pollution exposure and how access to outside areas will be managed to ensure doors are not left open allowing pollution to infiltrate.

Further to the Camden Clean Air Action plan the school should join TfL STARS school travel plan initiative, develop bespoke clean air routes to the school and actively encourage parents to take their children to school through more sustainable forms of transport such as walking and cycling.

### **2.10.2 Response to Comment**

As stated in Issue 3 response the air quality assessment predicted annual mean NO<sub>2</sub> concentrations to range from 34.34 – 40.03 µg/m<sup>3</sup> at the location of the proposed outdoor space (playground). As stated in LLAQM (TG16) if annual mean NO<sub>2</sub> concentrations are below 60 µg/m<sup>3</sup> then it is unlikely that the 1-



hour AQO will be exceeded. As such based on the results it is not predicted that concentrations will exceed the 1 hour mean AQO for NO<sub>2</sub> across the development site.

Vegetative screening as a mode of playground exposure reduction to pollutants is an area of current research. At present there is limited scientific evidence to suggest vegetation screening is any more effective in providing a pollutant barrier and reducing NO<sub>2</sub> concentrations than a non-vegetative screening e.g. wooden fence. However, an acoustic wall is proposed for the playground to shield the neighbours from noise during outside play time which will incorporate a galvanized metal grid allow climbing plants to cover the wall. Climbing vegetation will be planted on the school side of the wall, pruned annually.

Abacus Belsize Primary School is currently achieving Bronze STARS (Sustainable Travel: Active Responsibility, Safe) in the temporary site and will target Gold STARS when relocated to the Former Hampstead Police Station.

***Note prepared by Matt Mitchell, Air Quality Associate Director at REC Ltd, on 4th September 2019***