Report

RFL Hybrid Theatre Extension

Air Quality Assessment

For Royal Free London NHS Foundation Trust

11 October 2024

Air Quality CONSULTANTS | PART OF Logika Group

Document Control

Project Title:	RFL Hybrid Theatre Extension
Project Number:	J10/15442A/10
Client:	Royal Free London NHS Foundation Trust
Principal Contacts:	Harry Pluckrose (Gardiner & Theobald LLP) and Colin Sinclair (Montagu Evans)
Document Title:	Air Quality Assessment
Document Number:	J10/15442A/10/F1
Prepared By:	Dr Helen Robinson and Dr Frances Marshall
Reviewed By:	Penny Wilson (Technical Director)

Revision History

01	24/09/2024	Draft for client review.
02	11/10/2024	Final issue.

Registered Office: 3rd Floor St Augustine's Court, 1 St. Augustine's Place Bristol BS1 4UD Tel: +44(0)117 974 1086

24 Greville Street, Farringdon, London, EC1N 8SS Tel: +44(0)20 3873 4780

First Floor, Patten House, Moulders Lane, Warrington WA1 2BA Tel: +44(0)1925 937 195

8-9 Ship St, Brighton and Hove, Brighton BN1 1AD Tel: +44(0)20 3873 4780

Avenue du Port, 86c Box 204, 1000 Bruxelles Tel: +44(0)20 3873 47840

Contents

Tables

Figures

1 Introduction

1.1 This report describes the potential air quality impacts associated with a proposed extension to notably deliver new hybrid theatre accommodation to the Royal Free London (RFL) Hospital in the London Borough of Camden (LB of Camden) (hereafter referred to as the 'proposed development'). The proposed development is described as:

"Proposed extension to hospital at second and third storey level (above ground) with undercroft area beneath to deliver extension to hybrid theatres alongside roof-level plant and enclosure and associated works".

1.2 The proposed development lies within a borough-wide Air Quality Management Area (AQMA) declared by the LB of Camden for exceedances of the annual mean nitrogen dioxide (NO_2) objective and 24-hour mean particulate matter (PM_{10}) objective. It is set back by approximately 40 m from the B518 (Pond St), and by approximately 70 m from the A502 (Haverstock Hill). The location of the proposed development, to the immediate west of the existing main RFL Hospital building, is shown in Figure 1.

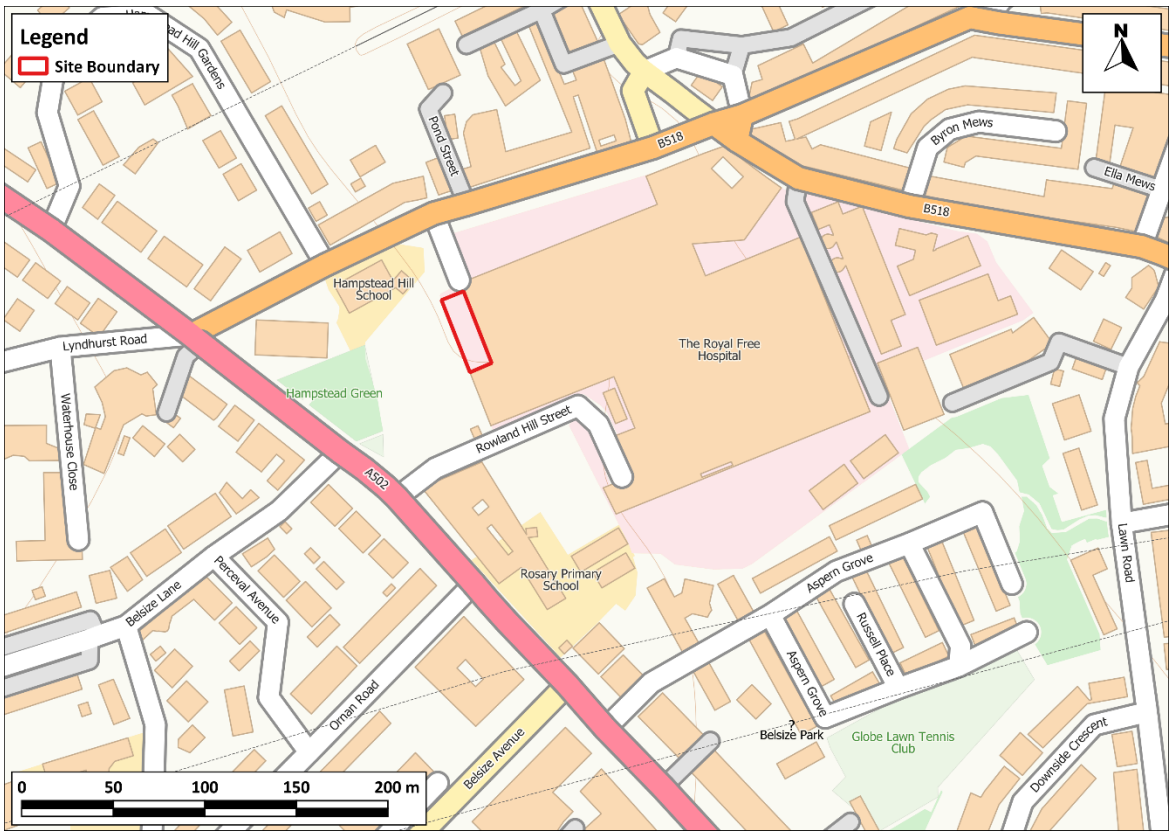

Figure 1: Proposed Development Setting

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

1.3 Whilst the proposals are 'car free' and do not include any additional parking provision (given existing provision within the wider hospital complex), the proposed development will lead to changes in vehicle flows on local roads, which may impact on air quality at existing residential properties, schools and the existing hospital buildings along the affected road network. Air quality also needs to be

considered to ensure that users of the extension are not exposed to exceedances of the air quality objectives.

1.4 The energy strategy for the proposed development is for an all-electric system which utilises air-source heat pumps; there will be no centralised combustion plant and thus there will be no significant local point sources of emissions within the proposed development that require consideration.

1.5 Emergency energy supply for the extension will be provided by connecting to the hospital's existing standby generators which are being upgraded as part of a separate application. These generators will exhaust from the roof of the main hospital building at the 14th-floor, which is approximately 80 m away. There will be no change to the servicing and maintenance regime, or operating load requirements, due to the proposed development, and thus emissions from these generators will not impact air quality within the proposed development or wider hospital, and no further consideration is necessary.

1.6 The Greater London Authority's (GLA's) London Plan (GLA, 2021) requires new developments to be air quality neutral. The air quality neutrality of the proposed development has been assessed following the methodology provided in the GLA's latest London Plan Guidance (Air Quality Neutral) (GLA, 2023a).

1.7 The GLA has also released Supplementary Planning Guidance (SPG) on the Control of Dust and Emissions from Construction and Demolition (GLA, 2014). The SPG outlines a risk assessment approach for construction dust assessments and helps determine the mitigation measures that will be necessary to apply. A construction dust assessment has been undertaken and the appropriate mitigation has been set out.

1.8 This report has been prepared taking into account all relevant local and national guidance and regulations, including the LB of Camden's Air Quality Planning Guidance (LB of Camden, 2021). The LB of Camden also requires an Air Quality Planning Checklist and Proforma to be submitted alongside air quality assessments for planning applications. The checklist is completed in Appendix A1 and the Proforma is submitted as a separate Excel document.

2 Policy Context

2.1 All European legislation referred to in this report is written into UK law and remains in place. The following Policy, Legislation and Guidance has been followed when preparing this document. For details of each, please see Appendix A1

- Air Quality Strategy 2007;
- Air Quality Strategy 2023;
- Clean Air Strategy 2019;
- Reducing Emissions from Road Transport: Road to Zero Strategy;
- Environment Act 2021;
- Environmental Improvement Plan 2023;
- National Planning Policy;
- London-Specific Policies;
    i) The London Plan;
    ii) London Environment Strategy;
    iii) Mayor's Transport Strategy;
    iv) GLA SPG: The Control of Dust and Emissions During Construction and Demolition;
    v) GLA London Plan Guidance (LPG): Air Quality Neutral;
    vi) Air Quality Focus Areas;
- Local Transport Plan;
- Local Policies (including LB of Camden Planning Guidance and adopted Local Plan);
- Building Standards;
- Air Quality Action Plans;
    vii) National Air Quality Plan; and
    viii) Local Air Quality Action Plan.

3 Pollutants of Concern

National & Regional Criteria

3.1 The main air pollutants of concern are NO_2 and fine particulate matter (PM_{10} and $PM_{2.5}$). These are the pollutants most related to road traffic emissions and known to have adverse health impacts. The UK-wide objectives for NO_2 and PM_{10} were to have been achieved by 2005 and 2004, respectively, and continue to apply in all future years thereafter.

3.2 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in London (GLA, 2019). The annual mean objectives for NO_2 and PM_{10} are considered to apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The 24-hour mean objective for PM_{10} is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for NO_2 applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.

3.3 For $PM_{2.5}$, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value[1], originally set at 25 µg/m^3 and currently set at 20 µg/m^3.

3.4 Defra has also recently set two new targets, and two new interim targets, for $PM_{2.5}$ concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean $PM_{2.5}$ concentration of 10 µg/m^3 by the end of 2040, with the interim target being a value of 12 µg/m^3 by the start of 2028[2]. The second set of targets relate to reducing overall population exposure to $PM_{2.5}$. By the end of 2040, overall population exposure to $PM_{2.5}$ should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.

3.5 Defra has provided advice (Defra, 2023a) which explains that there is no current requirement to consider the new $PM_{2.5}$ targets in planning decisions and that guidance to local planning authorities will be forthcoming before this position changes. In the future, when planning decisions do need to consider the new targets, the expectation is that this will focus on reducing emissions from new development rather than there being a direct requirement for planning-related air quality assessments to predict $PM_{2.5}$ concentrations.

3.6 For the time being, therefore, no assessment is required, and indeed no robust assessment is possible, in relation to the new $PM_{2.5}$ targets and they are not considered further.

3.7 As explained in Appendix A1, the GLA has set a target to achieve an annual mean $PM_{2.5}$ concentration of 10 µg/m^3 by 2030. This target was derived from an air quality guideline set by the World Health Organisation (WHO) in 2005. In 2021, WHO updated its guidelines, but the London Environment Strategy (GLA, 2018a) considers the 2005 guideline of 10 µg/m^3. While there is no explicit

[1] European Union (EU) Directive 2008/50/EC sets limit values for NO_2, PM_{10} and $PM_{2.5}$, and is implemented in UK law through the Air Quality Standards Regulations (2010). The limit values for NO_2 and PM_{10} are the same numerical concentrations as the UK objectives, but achievement of the limit values is a national obligation rather than a local one and concentrations are reported to the nearest whole number. In the UK, only monitoring and modelling carried out by UK Central Government meets the specification required to assess compliance with the limit values.

[2] Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m^3 would not exceed the 10 µg/m^3 target.

requirement to assess against the GLA target of 10 µg/m^3, it has nevertheless been included within this assessment.

3.8 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: National & Regional Air Quality Criteria for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Value
NO_2	1-hour Mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3
PM_{10}	24-hour Mean	50 µg/m^3 not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3
$PM_{2.5}$	Annual Mean	20 µg/m^3 [a]
	Annual Mean	10 µg/m^3 by 2030

[a] There is no numerical $PM_{2.5}$ objective for local authorities (see Paragraph 3.3). Convention is to assess against the UK limit value which is currently 20 µg/m^3.

Camden Criteria

3.9 The LB of Camden has committed within the Air Quality Camden Planning Guidance (CPG) (LB of Camden, 2021) and combined Clean Air Strategy and Clean Air Action Plan (CAAP) (LB of Camden, 2022) to meeting the WHO guideline limits for NO_2, PM_{10} and $PM_{2.5}$, as discussed in Appendix A1. However, the two documents quote different WHO limits; the CPG refers to the previous (2005) WHO limits to be met in 2030, while the CAAP refers to the current (2021) WHO limits to be met in 2034.

3.10 The commitment to meet the new WHO guidelines in the CAAP is described within the context of the Council's Local Air Quality Management (LAQM) responsibilities; the CAAP states that "*We will not consider that we have achieved the WHO guideline objectives until every monitoring location at which the pollutants are measured records annual mean concentrations which meet the relevant standards*". The purpose of the CAAP is to help fulfil the Council's requirements under the LAQM regime, rather than development control. The CAAP does not reference the WHO guidelines for planning, nor does the CAAP include any measures with respect to updating the Air Quality CPG to account for the latest WHO guidelines.

3.11 For the purpose of this assessment, the WHO guidelines outlined in the Air Quality CPG have been used as these relate to planning and are the guidelines quoted in the LB of Camden Air Quality Proforma to be submitted to accompany planning applications (LB of Camden, 2023). These guidelines are presented in Table 2 below. The corresponding interim target years for achievement as outlined in the Camden CAAP have also been provided.

Table 2: LB of Camden Air Quality Criteria for NO_2, PM_{10} and $PM_{2.5}$

Pollutant	Guideline Target (as an annual mean)	Target Achievement Year
NO_2	38 µg/m^3 [a]	- [b]
PM_{10}	20 µg/m^3	2026
$PM_{2.5}$	10 µg/m^3	2030

[a] While the WHO guideline is 40 µg/m^3, 38 µg/m^3 has been used in accordance with the Air Quality CPG which states that *"consideration must be paid to uncertainty in NO_2 data, therefore 38 µg/m^3 (the 40 µg/m^3 WHO limit less 5%) shall be taken as the limit for this pollutant."*.

[b] No achievement target timeframe for NO_2 as a target of 38 µg/m^3 should have already been met.

Construction Dust Criteria

3.12 There are no formal assessment criteria for dust. In the absence of formal criteria, the approach developed by the Institute of Air Quality Management (IAQM)[3] (2024) has been used (the GLA's SPG (GLA, 2014) recommends that the assessment be based on the latest version of the IAQM guidance). Full details of this approach are provided in Appendix A4.

[3] The IAQM is the professional body for air quality practitioners in the UK.

4 Assessment Approach

Existing Conditions

4.1 Existing sources of emissions and baseline air quality conditions within the study area have been defined using a number of approaches:

- industrial sources that may affect the area have been identified using Defra's Pollutant Release and Transfer Register (Defra, 2024);
- information on existing air quality has been obtained by collating the results of monitoring carried out by the LB of Camden; and
- information on existing air quality has also been obtained through examination of the London Atmospheric Emissions Inventory (LAEI) database produced by the GLA (GLA, 2023b). These predicted concentrations cover the whole of the GLA area at 20 m grid resolution.

Construction Impacts

4.2 The construction dust assessment considers the potential for impacts within 250 m of the site boundary, or within 50 m of roads used by construction vehicles. The assessment methodology follows the GLA's SPG on the Control of Dust and Emissions During Construction and Demolition (GLA, 2014), which is based on that provided by IAQM (2024).

4.3 This follows a sequence of steps. Step 1 is a basic screening stage, to determine whether the more detailed assessment provided in Step 2 is required. Step 2a determines the potential for dust to be raised from on-site works and by vehicles leaving the site. Step 2b defines the sensitivity of the area to any dust that may be raised. Step 2c combines the information from Steps 2a and 2b to determine the risk of dust impacts without appropriate mitigation. Step 3 uses this information to determine the appropriate level of mitigation required to ensure that there should be no significant impacts. Appendix A4 explains the approach in more detail.

4.4 Guidance from the IAQM (2024) is that, with appropriate mitigation in place, the effects of construction dust will be 'not significant'. This is the latest version of the guidance upon which the assessment methodology set out in the GLA guidance (GLA, 2014) is based (the GLA guidance advises that the latest version of the IAQM guidance should always be used). The assessment thus focuses on determining the appropriate level of mitigation so as to ensure that effects will normally be 'not significant'.

Impacts of Road Traffic from the Proposed Development

4.5 Environmental Protection UK (EPUK) and IAQM recommend a two-stage screening approach (Moorcroft and Barrowcliffe et al, 2017) to determine whether emissions from road traffic generated by a development have the potential for significant air quality effects. The approach, as described in Appendix A3, first considers the size of a development; if the development is for fewer than ten homes or covers less than 1,000 m^2 of other land uses and will provide ten or fewer parking spaces, then there is no need to progress to a detailed assessment.

4.6 Since the proposed development is above the development size, the potential impacts on air quality from traffic generated by the development need to be considered. The EPUK/IAQM guidance has also set out screening criteria, below which it can be assumed that there will not be significant effects on air quality. The criteria for inside an AQMA are a change in traffic flows of more than 100 Light Duty

Vehicles (LDVs) as an Annual Average Daily Traffic (AADT) flow, or more than 25 Heavy Duty Vehicles (HDVs) as an AADT flow. The traffic flows generated by the proposed development have, therefore, initially been compared to these screening criteria.

Impacts of Road Traffic on Future Users of the Proposed Development

4.7 The impacts of NO_2, PM_{10} and $PM_{2.5}$ concentrations on the development have been assessed qualitatively. The assessment considers air quality conditions within the site taking account of local air quality monitoring data, proximity to local roads and the predicted LAEI concentrations.

4.8 There is no official guidance in the UK in relation to development control on how to assess the significance of air quality impacts. The overall significance of the air quality impacts is determined based on comparison between the likely concentrations at the development and the air quality objectives. Where concentrations remain below the objectives, it can be concluded that the overall effect will be 'not significant'.

'Air Quality Neutral'

4.9 The GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2023a) sets out guidance on how an 'air quality neutral' assessment should be undertaken. It also provides a methodology for calculating an offsetting payment if a development is not 'air quality neutral' and it is not possible to identify or agree appropriate and adequate mitigation.

4.10 The guidance provides a simplified assessment approach for developments that are 'car free' and do not include any centralised combustion plant for the routine provision of energy. This simplified approach has been followed in this report.

5 Construction Phase Assessment

Construction Traffic

5.1 Given the small size of the proposed development and the use of consolidated deliveries, as outlined in the Construction Management Plan (CMP) prepared by Blue Sky Building, it is anticipated that the additional heavy vehicle movements on local roads will be well below the 25 AADT screening criterion recommended by EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017).

5.2 It is, therefore, not considered necessary to assess the impacts of traffic emissions during the construction phase and it can be concluded that emissions from construction traffic generated by the proposed development will not have a significant effect on local roadside air quality.

On-Site Exhaust Emissions

5.3 The IAQM guidance (IAQM, 2024) states:

"Experience of assessing the exhaust emissions from on-site plant (also known as non-road mobile machinery or NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. For site plant and on-site traffic, consideration should be given to the number of plant/vehicles and their operating hours and locations to assess whether a significant effect is likely to occur".

5.4 The proposed development is small in scale, thus the number of NRMM able to operate at any one time will be limited. In line with the GLA's Control of Dust and Emissions During Construction and Demolition SPG, and as described in Appendix A4, NRMM are expected to comply with emissions standards. Additionally, there will be no idling when vehicles are not in use, and machinery will be located away from sensitive receptors as far as possible and turned off when not in use.

5.5 It is judged that there is no risk of significant effects at existing receptors as a result of on-site machinery emissions.

Construction Dust and Particulate Matter Emissions

5.6 The construction works will give rise to a risk of dust impacts during demolition, earthworks and construction, as well as from trackout of dust and dirt by vehicles onto the public highway. Step 1 of the assessment procedure is to screen the need for a risk assessment. There are receptors within the distances set out in the guidance (see Appendix A4), thus a detailed assessment is required. The following section sets out Step 2 of the assessment procedure.

Potential Dust Emission Magnitude

Demolition

5.7 Demolition will be kept to a minimum; it will highly localised and only take place where required to adjoin the extension to the main hospital building.

5.8 Based on the example definitions set out in Table A4-1 in Appendix A4, the dust emission class for demolition is considered to be *small*.

Earthworks

5.9 The characteristics of the soil at the site have been defined using the British Geological Survey's UK Soil Observatory website (British Geological Survey, 2024), as set out in Table 3. Overall, it is considered that, when dry, this soil has the potential to be moderately dusty.

Table 3: Summary of Soil Characteristics

Category	Record
Soil Layer Thickness	Deep
Soil Parent Material Grain Size	Argillaceous [a]
European Soil Bureau Description	Pre-quaternary marine/estuarine sand and silt
Soil Group	Medium to Light (silty) to Heavy
Soil Texture	Clayey Loam [b] to Silty Loam

[a] grain size < 0.06 mm.

[b] a loam is composed mostly of sand and silt.

5.10 The site covers approximately 2,100 m^2 and will be subject to limited earthworks to redirect existing buried services and prepare the ground for piled foundations. Dust will arise mainly from the handling of dusty materials (such as dry soil).

5.11 Based on the example definitions set out in Table A4-1 in Appendix A4, the dust emission class for earthworks is considered to be *small.*

Construction

5.12 The proposed development involves the construction of an extension at second and third storey level (above ground) with an undercroft area beneath and roof-level plant. The total building volume is estimated to be 4,500 m^3. Due to limited space on site, it is intended that many aspects of the construction will be prefabricated, and thus there will be limited dust-generating activities on site.

5.13 Based on the example definitions set out in Table A4-1 in Appendix A4, the dust emission class for construction is considered to be *small*.

Trackout

5.14 Due to the limited space for vehicles to enter the site, deliver materials, and exit again, vehicles will not travel over unpaved roads before exiting the site. However, the consideration of trackout has been included in the assessment to provide a conservative assessment. The number of heavy vehicles which may track out dust and dirt is currently unknown but given the small size of the site and consolidated delivery plan, it is likely that there will be less than 20 outward heavy vehicle movements per day.

5.15 Based on the example definitions set out in Table A4-1 in Appendix A4, the dust emission class for trackout is considered to be *small*.

5.16 Table 4 summarises the dust emission magnitude for the proposed development.

Table 4: Summary of Dust Emission Magnitude

Source	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Small

Sensitivity of the Area

5.17 This assessment step combines the sensitivity of individual receptors to dust effects with the number of receptors in the area and their proximity to the site. It also considers additional site-specific factors such as topography and screening, and in the case of sensitivity to human health effects, baseline PM_{10} concentrations.

5.18 The IAQM guidance, upon which the GLA's guidance is based, explains that 'high' sensitivity receptors to dust soiling are where *"the people or property would reasonably be expected to be present continuously"*, and 'high' sensitivity receptors to human health effects are *"locations where members of the public may be exposed for eight hours or more in a day"* (Table A4-2 in Appendix A4). Hospitals and schools are, therefore, classified as being of 'high' sensitivity to dust soiling and human health effects. Given the constrained nature of the site with the existing Royal Free Hospital to the east, Hampstead Hill school to the north-west, and the new Pears Building (in construction on Google imagery) to the west, it is judged that there are more than 100 high-sensitivity receptors within 20 m of the site boundary (see Figure 2).

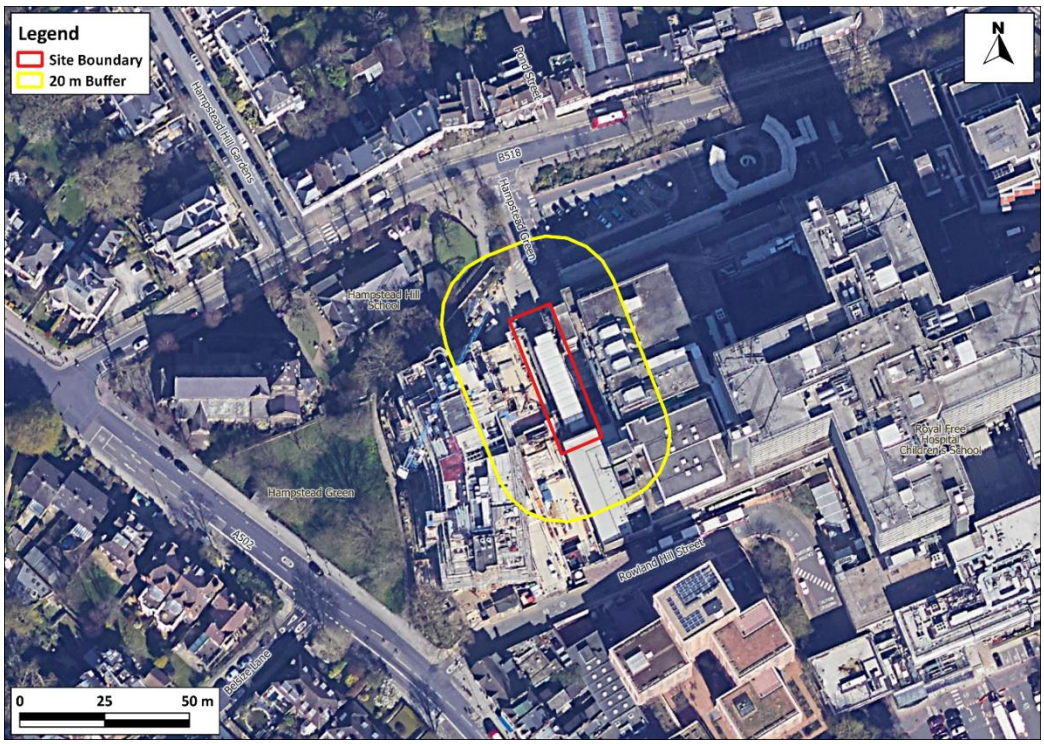

Figure 2: 20 m Distance Band around Site Boundary

5.19 The IAQM guidance (IAQM, 2024) explains that there is a risk of material being tracked 250 m from the site exit. Whilst vehicles are required to turn left out of the hospital main access road onto Pond Street, it is currently not known which way they will route at the junction with the A502. As such, it has been assumed that vehicles could travel in both directions on the A502. There are approximately 35 residential properties and Hampstead Hill School (365 pupils on the school roll[4]) within 20 m of the roads along which material could be tracked (see Figure 3). There are, therefore, more than 100 receptors within 20 m of the roads along which material could be tracked, in addition to receptors within the hospital itself.

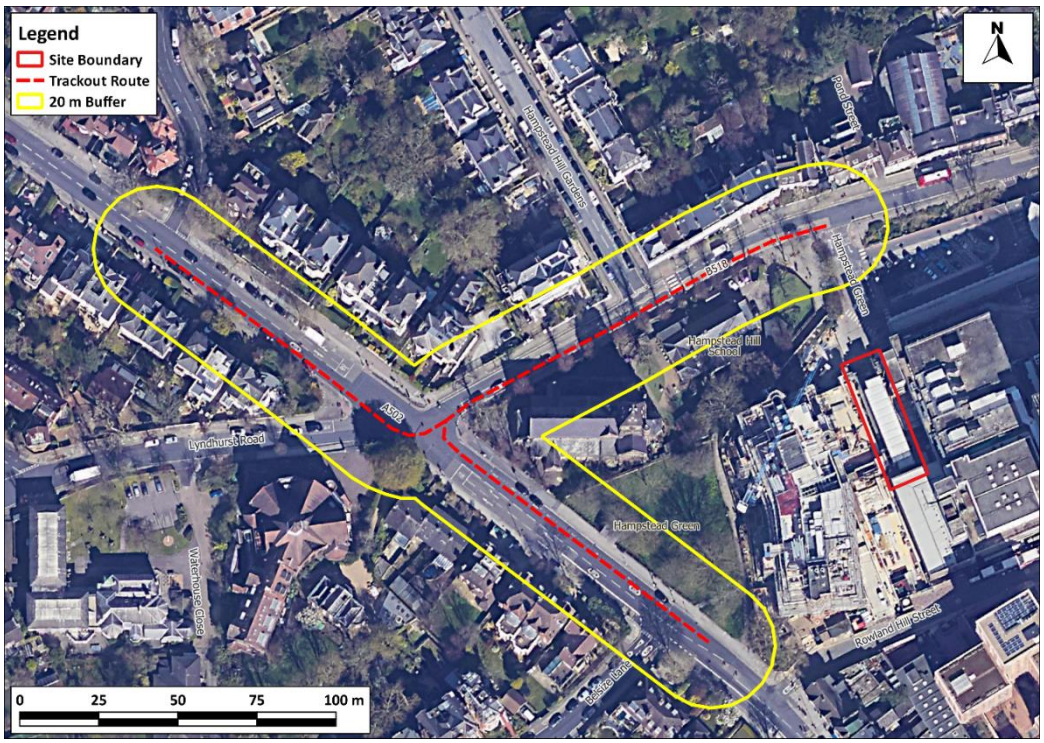

Figure 3: 20 m Distance Band around Roads Used by Construction Traffic Within 250 m of the Site Exit

Sensitivity of the Area to Effects from Dust Soiling

5.20 Using the information set out in Paragraph 5.18 and Figure 2 alongside the matrix set out in Table A4-3 in Appendix A4, the area surrounding the onsite works is of 'high' sensitivity to dust soiling.

5.21 Using the information set out in Paragraph 5.19 and Figure 3 alongside the same matrix, the area is also of 'high' sensitivity to dust soiling due to trackout. However, as outlined in Paragraph 5.14, this represent a conservative assessment as the potential for trackout is limited due to vehicles not travelling over unpaved roads.

Sensitivity of the Area to any Human Health Effects

5.22 The matrix in Table A4-4 in Appendix A4 requires information on the baseline annual mean PM_{10} concentration in the area. It is considered that the predicted PM_{10} concentrations from the LAEI are

[4] https://hampsteadhillschool.co.uk/wp-content/uploads/2021/09/HHS-2018-Ofsted.pdf

the best representation of local concentrations; all the grid squares within the areas outlined in Figure 2 and Figure 3 are below 24 µg/m^3 in 2019.

5.23 Using the information set out in Paragraph 5.18 and Figure 2 alongside the matrix in Table A4-4 in Appendix A4, the area surrounding the onsite works is of 'medium' sensitivity to human health effects. Using the information set out in Paragraph 5.19 and Figure 3 alongside the same matrix, the area surrounding roads along which material may be tracked from the site is also of 'medium' sensitivity.

Sensitivity of the Area to any Ecological Effects

5.24 The guidance only considers designated ecological sites within 50 m to have the potential to be impacted by the construction works. There are no designated ecological sites within 50 m of the site boundary or those roads along which material may be tracked, thus ecological impacts will not be considered further.

Summary of the Area Sensitivity

5.25 Table 5 summarises the sensitivity of the area around the proposed construction works.

Table 5: Summary of the Area Sensitivity

Effects Associated With:	Sensitivity of the Surrounding Area	
	On-site Works	Trackout
Dust Soiling	High Sensitivity	High Sensitivity
Human Health	Medium Sensitivity	Medium Sensitivity

Risk and Significance

5.26 The dust emission magnitudes in Table 4 have been combined with the sensitivities of the area in Table 5 using the matrix in Table A4-6 in Appendix A4, in order to assign a risk category to each activity. The resulting risk categories for the four construction activities, without mitigation, are set out in Table 6. These risk categories have been used to determine the appropriate level of mitigation as set out in Section 8 (Step 3 of the assessment procedure).

Table 6: Summary of Risk of Impacts Without Mitigation

Source	Dust Soiling	Human Health
Demolition	Medium Risk	Low Risk
Earthworks	Low Risk	Low Risk
Construction	Low Risk	Low Risk
Trackout	Low Risk	Low Risk

5.27 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant' (IAQM, 2024).

6 Operational Phase Impact Assessment

Relevant Features

6.1 The proposed development lies within a borough-wide AQMA declared by the LB of Camden for exceedances of the annual mean NO_2 objective and 24-hour mean PM_{10} objective.

6.2 The proposed extension is to the western side of the existing Royal Free Hospital, and is set back by approximately 40 m from the B518 (Pond St), and by approximately 70 m from the A502 (Haverstock Hill), as shown in Figure 1.

Impacts at Existing Receptors

6.3 The proposed development is expected to generate a total of 78 daily LDV trips and very few operational heavy vehicle trips; these daily trip rates are below the screening threshold of 100 LDVs recommended for use inside an AQMA in the EPUK/IAQM guidance (Moorcroft and Barrowcliffe et al, 2017) (see Appendix A3). As such, it is judged that the relevant screening thresholds will not be exceeded and there is no requirement for a detailed assessment of road traffic impacts at existing receptors.

6.4 The proposed development places a solid structure over an existing access road to the underground car park for the adjacent Pears Building, which could lead to restricted dispersion of vehicle emissions. Nonetheless, it is understood that there are no openable windows, doors, or ventilation intakes for the neighbouring buildings in the small area that will be covered. If necessary, this will be confirmed at a later stage in the planning process. Similarly, members of the public are unlikely to congregate in the covered area.

6.5 As such, it can be concluded that the proposed development will have a negligible impact on local roadside air quality.

Impacts of Existing Sources on Future Occupants of the Development

Industrial Sources

6.6 No significant industrial sources have been identified that are likely to affect the proposed development, in terms of air quality.

Local Air Quality Monitoring

6.7 The LB of Camden operates five automatic monitoring stations within its area. The automatic monitoring locations most representative of likely concentrations at the proposed development are the urban background sites ('BL0' and 'KGX') as they are set back from the nearest respective main roads by approximately 50 m (compared to 70 m between the proposed development and the A502).

6.8 Concentrations of NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) are measured at 'BL0', while only particulate matter concentrations are measured at 'KGX'. The locations of these automatic monitoring sites are shown in Figure 4.

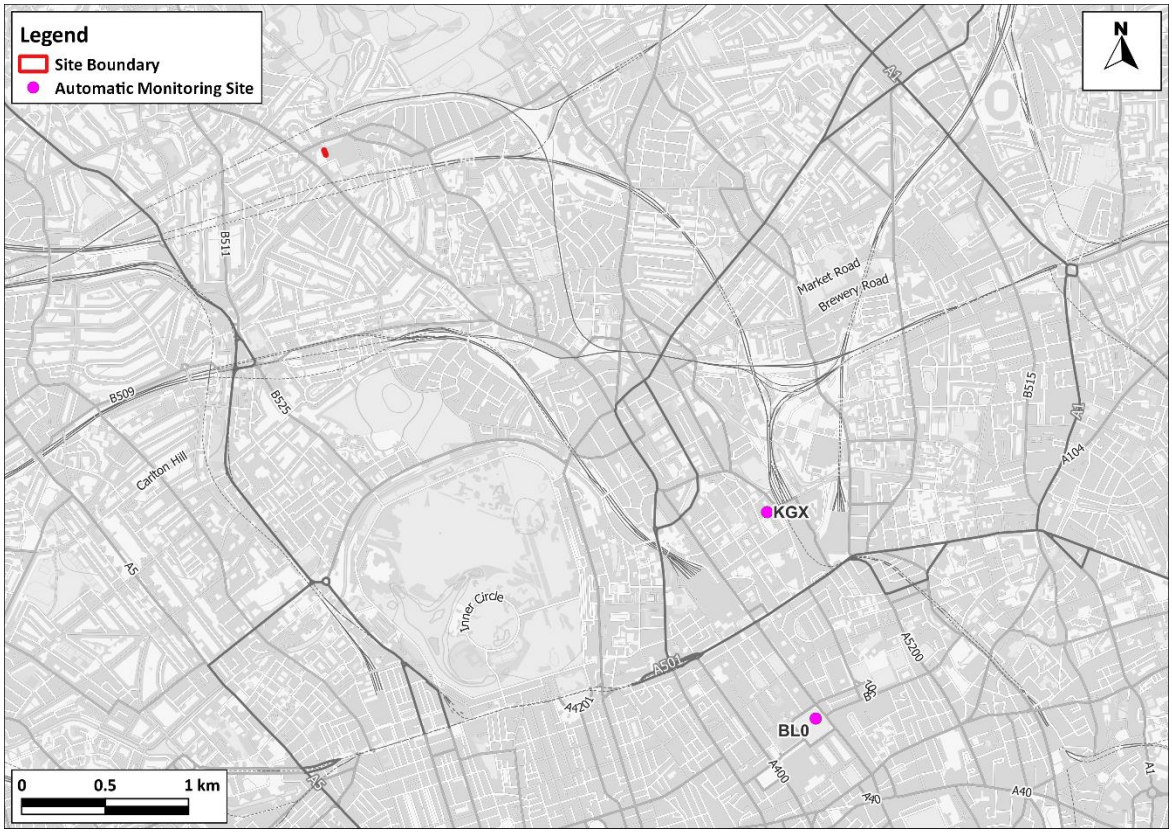

Figure 4: Automatic Monitoring Locations

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

6.9 The Council also operates a number of NO_2 monitoring sites using diffusion tubes prepared and analysed by Socotec UK[5] (using the 50% TEA in acetone method). These currently include seven locations within 500 m of the proposed development. Historically, there was a diffusion tube located on Pond St, but this has been decommissioned. The current diffusion tube monitoring locations are shown in Figure 5.

[5] 2023 is the first year LB of Camden used Socotec UK; results for years prior to 2023 were analysed by Gradko International.

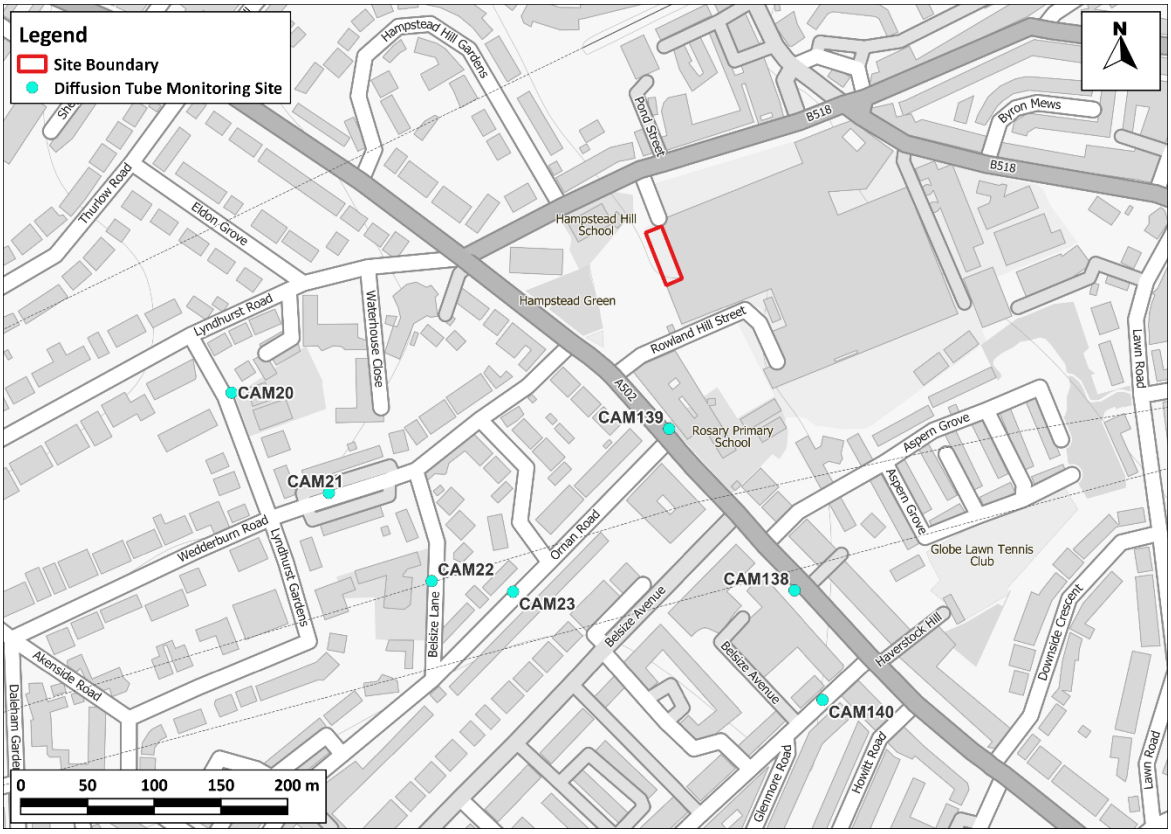

Figure 5: Diffusion Tube Monitoring Locations

Additional data sourced from third parties, including public sector information licensed under the Open Government Licence v3.0.

6.10 Annual mean NO_2 results for the years 2018 to 2023[6] are summarised in Table 7, while results relating to the 1-hour mean objective are summarised in Table 8. The monitoring data have been taken from LB of Camden's Air Quality Annual Status Report for 2023 (LB of Camden, 2024a).

Table 7: Summary of Annual Mean NO_2 Monitoring (µg/m³) [a]

Site ID	Site Type	Location	2018	2019	2020	2021	2022	2023
BL0	Urban background	London Bloomsbury – Russell Square Gardens	36.0	32.0	28.0	27.0	26.0	24.0
CAM20	Roadside	HSS Phase 4&5 8 - Lyndhurst House Prep - Lyndhurst Gardens	-	-	-	19.6	19.0	20.9
CAM21	Roadside	HSS Phase 4&5 9 - Lyndhurst House Prep - Wedderburn Road	-	-	-	19.3	19.0	20.8

[6] While 2020 and 2021 results have been presented in this Section for completeness, they are not relied upon in any way as they will not be representative of 'typical' air quality conditions due to the impact of the Covid-19 pandemic on traffic volumes and thus pollutant concentrations.

Site ID	Site Type	Location	2018	2019	2020	2021	2022	2023
CAM22	Roadside	HSS Phase 4&5 10 - St Christopher's - Belsize Lane	-	-	-	19.5	19.5	21.5
CAM23	Roadside	HSS Phase 4&5 11 - St Christopher's - Orman Road	-	-	-	20.3	21.0	22.7
CAM138	Roadside	Haverstock Hill 1 - Haverstock Hill northbound	-	-	30.8	30.9	32.1	32.8
CAM139	Roadside	Haverstock Hill 2 - Haverstock Hill southbound	-	-	32.2	37.3	34.5	35.7
CAM140	Roadside	Haverstock Hill 3 - Glenloch Road	-	-	22.5	21.8	20.7	24.3
Objective / Camden Criteria			**40 / 38**					

[a] Results presented to one decimal place.

Table 8: Number of Hours with NO_2 Concentrations Above 200 µg/m³

Site ID	Site Type	Location	2018	2019	2020	2021	2022	2023
BL0	Urban background	London Bloomsbury – Russell Square Gardens	0	0	0	0	0	0
Objective			**18**					

6.11 The annual mean NO_2 concentrations presented in Table 7 show there have been no exceedances of the objective or Camden criteria in the last six years. Monitoring at 'BL0' demonstrates a significant reduction in NO_2 concentrations from 36.0 µg/m³ in 2018 to 24.0 µg/m³ in 2023. In the most recent year of monitoring (2023) concentrations across all sites presented were below the objective, including sites 'CAM138' and 'CAM139' which are located adjacent to the nearest major road.

6.12 Table 8 demonstrates that there have also been no exceedances of the 1-hour mean NO_2 objective in the last six years.

6.13 Annual mean particulate matter (PM_{10} and $PM_{2.5}$) results for the years 2018 to 2023[6] are summarised in Table 9, while results relating to the daily mean PM_{10} objective are summarised in Table 10. Exceedances of the assessment criteria are shown in bold.

Table 9: Summary of Annual Mean PM_{10} and $PM_{2.5}$ Monitoring (µg/m³)

Site ID	Site Type	Location	2018	2019	2020	2021	2022	2023
PM_{10}								
BL0	Urban background	London Bloomsbury – Russell Square Gardens	17	18	16	16	17	13
KGX	Urban background / Industrial	Coopers Lane	15	15	13	13	15	14
Objective / Camden Criteria			**40 / 20**					
$PM_{2.5}$								
BL0	Urban background	London Bloomsbury – Russell Square Gardens	10	**11**	9	9	9	8
KGX	Urban background / Industrial	Coopers Lane	-	-	-	-	10	8
Objective / Camden Criteria & GLA Target			**20 / 10**					

Table 10: Number of Days with PM_{10} Concentrations Above 50 µg/m³

Site ID	Site Type	Location	2018	2019	2020	2021	2022	2023
BL0	Urban background	London Bloomsbury – Russell Square Gardens	1	9	4	0	5	0
KGX	Urban background / Industrial	Coopers Lane	1	5	1	0	5	1
Objective			**35**					

6.14 The data presented in Table 9 show that PM_{10} and $PM_{2.5}$ concentrations have remained below the national objective at the selected monitoring sites throughout the previous six years. While there was a small uplift in concentrations at some sites in 2019, there has been an overall downward trend in both PM_{10} and $PM_{2.5}$ concentrations between 2018 and 2023.

6.15 Measured PM_{10} concentrations have also met the Camden criteria throughout the whole period presented. While $PM_{2.5}$ concentrations exceeded 10 µg/m³ (Camden criteria and GLA target) at site 'BL0' in 2019, they were below the criteria/target at both sites in 2023.

6.16 Table 10 also demonstrates that there have been no exceedances of the 24-hour PM_{10} objective in the last six years.

LAEI Concentration Maps

6.17 In addition to the locally measured concentrations discussed above, the maximum pollutant concentrations predicted across the site in 2019, 2025 and 2030 (all modelled scenarios available)

have been determined from the LAEI database produced by the GLA (2023b), and are presented in Table 11.

6.18 The predicted concentrations are below the national objectives across all years, and also meet the Camden criteria in 2025 and 2030.

Table 11: Maximum Predicted LAEI Concentrations at the Proposed Development in 2019, 2025 and 2030 (µg/m³)

Year	NO_2	PM_{10}	$PM_{2.5}$
2019	32.5	17.4	11.3
2025	22.4	16.3	10.0
2030	17.7	15.2	9.2
Objective / Camden Criteria / GLA Target	**40 / 38**	**40 / 20 (by 2026)**	**20 [a] / 10 (by 2030) / 10 [b]**

[a] The 20 µg/m³ $PM_{2.5}$ objective is not in Regulations and there is no requirement for local authorities to meet it.

[b] 10 µg/m³ is the GLA target for annual mean $PM_{2.5}$; again, there is no requirement for local authorities to meet this.

Impacts

6.19 The proposed development is located well away from any busy roads, in an area where pollutant concentrations have been shown to be below the national objectives and relevant Camden criteria (see Table 11).

6.20 Nevertheless, due to the nature of the facility, mechanical ventilation is required and air intakes will be located on the roof of the proposed development, thus maximising the distance to nearby road traffic sources. There are also no NOx or PM-generating plant equipment located on the same roof as the ventilation equipment, and there are no openable windows within the proposed development.

6.21 It can be therefore considered that future users of the proposed development will experience acceptable air quality conditions, and there is no need for more detailed assessment.

Significance

6.22 The operational air quality effects without mitigation are judged to be 'not significant'. This professional judgement is made in accordance with the methodology set out in Appendix A3, and takes account of the assessment that:

- pollutant concentrations within the proposed development will all be below the national objectives and Camden criteria, and the $PM_{2.5}$ GLA target will be met by 2030, thus future users will experience acceptable air quality; and
- the proposed development will generate traffic below industry screening thresholds and does not include any combustion plant, thus will not lead to significant emissions.

7 'Air Quality Neutral'

7.1 The purpose of the London Plan's requirement that development proposals be 'air quality neutral' is to prevent the gradual deterioration of air quality throughout Greater London. The 'air quality neutrality' of a proposed development, as assessed in this section, does not directly indicate the potential of the proposed development to have significant effects on human health (this has been assessed separately in the previous section).

7.2 The air quality neutral assessment has been undertaken using the latest GLA's London Plan Guidance (Air Quality Neutral) (GLA, 2023a).

Building Emissions

7.3 The proposed development does not include any combustion plant for the routine provision of electricity, heating or hot water and will thus have no direct building emissions.

7.4 The proposed development is, therefore, air quality neutral in terms of building emissions.

Road Transport Emissions

7.5 The proposed development will not provide any additional car parking spaces, and therefore meets the requirement of 'car free'[7]. Paragraph 4.1.2 of the guidance states "*where major developments meet the definition of 'car-free', they can be assumed to meet the TEB*" (Transport Emission Benchmark).

7.6 The proposed development is, therefore, air quality neutral in terms of transport emissions.

Summary

7.7 The proposed development complies with the requirement that all new developments in London should be at least air quality neutral.

[7] The Air Quality Neutral guidance states that "*Developments that are defined as 'car-free' may include provision for disabled persons parking*". Taxi, delivery and servicing vehicle trips are not covered by the Air Quality Neutral process.

8 Mitigation

Good Design and Best Practice

8.1 The EPUK/IAQM guidance advises that good design and best practice measures should be considered, whether or not more specific mitigation is required.

8.2 The proposed development incorporates the following good design and best practice measures:

- designing the extension at second floor and above to increase distance from road sources;
- no additional car parking spaces to discourage the use of private vehicles to access the proposed development;
- provision of pedestrian and cycle access to the new development, including cycle parking;
- provision of a travel plan to encourage sustainable transport choices to and from the hospital;
- provision of mechanical ventilation with air inlets located at roof level to provide the cleanest possible air to users;
- use of air-source heating to avoid the need for on-site combustion; and
- the implementation of existing hospital-wide measures set out in the RFL's green commitment (see Appendix A2, paragraph A2.46), such as an anti-idling policy.

Recommended Mitigation

Construction Impacts

8.3 Measures to mitigate dust emissions will be required during the construction phase of the development in order to minimise effects upon nearby sensitive receptors.

8.4 The site has been identified as a *Medium* Risk site during demolition and a *Low* Risk site during earthworks, construction, and for trackout, as set out in Table 6. The GLA's SPG on *The Control of Dust and Emissions During Construction and Demolition* (GLA, 2014) describes measures that should be employed, as appropriate, to reduce the impacts, along with guidance on what monitoring should be undertaken during the construction phase. This reflects best practice experience and has been used, together with the professional experience of the consultant who has undertaken the dust impact assessment and the findings of the assessment, to draw up a set of measures that should be incorporated into the specification for the works. These measures are described in Appendix A5.

8.5 The mitigation measures should be written into a Dust Management Plan (DMP). The GLA's guidance suggests that, for a Medium Risk site, automatic monitoring of particulate matter (as PM_{10}) will be required. It also states that, on certain sites, it may be appropriate to determine the existing (baseline) pollution levels before work begins. However, the guidance is clear that the Local Authority should advise as to the appropriate air quality monitoring procedure and timescale on a case-by-case basis. The LB of Camden's CPG on Air Quality (LB of Camden, 2021) outlines that for Medium Risk sites, the Council typically require a minimum of two real-time monitors. The requirement for monitoring has also been written into the CMP produced by Blue Sky Building.

8.6 Where mitigation measures rely on water, it is expected that only sufficient water will be applied to damp down the material. There should not be any excess to potentially contaminate local watercourses.

Road Traffic Impacts

8.7 The assessment has demonstrated that the overall air quality effect of the proposed development will be 'not significant'; it will not introduce any new exposure into areas of unacceptable air quality, nor will the development-generated traffic emissions have a significant effect on local air quality. It is, therefore, not considered appropriate to propose mitigation measures for this development.

Air Quality Neutral

8.8 The air quality neutral policy is intended to minimise the cumulative impacts of many developments throughout London. The proposed development has been shown to be 'air quality neutral', and therefore, no offsetting of emissions is required.

9 Conclusions

9.1 The assessment has considered the impacts of the proposed development on local air quality in terms of dust and particulate matter emissions during construction and emissions from road traffic generated by the completed and occupied development. It has also identified the air quality conditions that future users will experience.

Construction Impacts

9.2 The construction works have the potential to create dust. During construction it will therefore be necessary to apply a package of mitigation measures to minimise dust emissions. Appropriate measures have been recommended and, with these measures in place, it is expected that any residual effects will be 'not significant'.

Operational Impacts

9.3 Air quality conditions for future users of the proposed development have been shown to be acceptable, with concentrations below the air quality objectives throughout the site. $PM_{2.5}$ concentrations will also be below the GLA target in 2030 and the Camden criteria will also be met in all relevant years.

9.4 The traffic generated by the proposed development will be below industry screening thresholds and it will not introduce any centralised combustion sources. Thus, the proposed development will have a negligible impact on air quality conditions at all existing receptors.

9.5 The proposed development integrates a number of good design and best practice measures, thus it is not necessary to recommend mitigation.

9.6 The overall operational air quality effects of the proposed development are judged to be 'not significant'.

Air Quality Neutral

9.7 The proposed development therefore complies with the requirement that all new developments in London should be at least air quality neutral.

Policy Implications

9.8 Taking into account these conclusions, it is judged that the proposed development is consistent with Paragraph 191 of the NPPF, being appropriate for its location both in terms of its effects on the local air quality environment and the air quality conditions for future users. It is also consistent with Paragraph 192, as it will not affect compliance with relevant limit values or national objectives.

9.9 The proposed development is compliant with Policy SI 1 of the London Plan in the following ways:

- it will not lead to further deterioration of existing poor air quality;
- it will not cause or extend any exceedances of legal air quality limits;
- it will not create new exposure to poor air quality; and
- it is air quality neutral.

9.10 The proposed development is also consistent with the following policies in the LB of Camden's Local Plan:

- Policy CC4, as it will not cause harm to local air quality, it will not introduce sensitive receptors into an area of poor air quality, and a construction dust risk assessment has been completed with associated mitigation measures set out;
- Policy T2, as the proposed development is 'car free'; and
- Policy A1, as the mitigation measures set out in Appendix A5 will ensure that the amenity of communities, occupiers and neighbours is protected.

9.11 The proposed development is also consistent with Policy A3 of the new Draft Local Plan as it is air quality neutral.

10 References

British Geological Survey (2024) *UK Soil Observatory Map Viewer*.

Defra (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland*, Defra.

Defra (2017) *Air quality plan for nitrogen dioxide (NO2) in the UK*, Available: https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017.

Defra (2018a) *A Green Future: Our 25 Year Plan to Improve the Environment*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf.

Defra (2018b) *Supplement to the UK plan for tackling roadside nitrogen dioxide concentrations*, Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746100/air-quality-no2-plan-supplement.pdf.

Defra (2019) *Clean Air Strategy 2019*, Available: https://www.gov.uk/government/publications/clean-air-strategy-2019.

Defra (2023a) *Integrating the Environment Act air quality targets into the planning system*, 102023rd edition.

Defra (2023b) *Air Quality Strategy: Framework for Local Authority Delivery*, [Online], Available: https://www.gov.uk/government/publications/the-air-quality-strategy-for-england/air-quality-strategy-framework-for-local-authority-delivery.

Defra (2023c) *Environmental Improvement Plan 2023*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1133967/environmental-improvement-plan-2023.pdf.

Defra (2024) *UK Pollutant Release and Transfer Register*, Available: http://prtr.defra.gov.uk/map-search.

Department for Health (2021) *Health Technical Memorandum 03-01: Specialised ventilation for healthcare premises*, [Online].

Department for Levelling Up, Housing and Communities (DLUHC) (2023) *National Planning Policy Framework*, [Online], Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf.

DfT (2018) *The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy*.

GLA (2014) *The Control of Dust and Emissions from Construction and Demolition SPG*, Available: https://www.london.gov.uk/what-we-do/planning/implementing-london-plan/supplementary-planning-guidance/control-dust-and.

GLA (2018a) *London Environment Strategy*, Available: https://www.london.gov.uk/what-we-do/environment/london-environment-strategy.

GLA (2018b) *Mayor's Transport Strategy*.

GLA (2019) 'London Local Air Quality Management Technical Guidance 2019', no. https://www.london.gov.uk/sites/default/files/llaqm_technical_guidance_2019.pdf.

GLA (2021) *The London Plan: The Spatial Development Strategy for London*, Available: https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf.

GLA (2023a) *London Plan Guidance - Air Quality Neutral.*, Available: https://www.london.gov.uk/programmes-strategies/planning/implementing-london-plan/london-plan-guidance/air-quality-neutral-aqn-guidance.

GLA (2023b) *London Atmospheric Emissions Investory (LAEI) 2019, Updated 2023*.

HM Government (2021) *Ventilation - Approved Document F*, [Online], Available: https://www.gov.uk/government/publications/ventilation-approved-document-f.

IAQM (2024) *Guidance on the Assessmentof Dust from Demolition and Construction v2.2*, [Online], Available: http://iaqm.co.uk/guidance/.

LB of Camden (2017) *Camden Local Plan 2017*.

LB of Camden (2019) *Healthy Streets, Healthy Travel, Healthy Lives: Camden Transport Strategy 2019-2041*.

LB of Camden (2021) *Camden Planning Guidance Air Quality January 2021*.

LB of Camden (2022) *Camden Clean Air Strategy 2019-2034 and Camden Clean Air Action Plan 2023-2026*.

LB of Camden (2023) *Air Quality Assessment in Planning Applications*, [Online], Available: https://www.camden.gov.uk/air-quality-assessment.

LB of Camden (2024a) *Air Quality Annual Status Report for 2023*, [Online], Available: https://www.camden.gov.uk/documents/d/guest/camden-2023-air-quality-annual-status-report-final-v2.

LB of Camden (2024b) *Draft New Camden Local Plan - Regulation 18 Consultation Version*.

Ministry of Housing, Communities & Local Government (2019) *Planning Practice Guidance*, Available: https://www.gov.uk/government/collections/planning-practice-guidance.

Ministry of Housing, Communities & Local Government (2022) *The Building Regulations 2010 Schedule 1*, 201022141st edition, Available: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/899279/Single_stitched_together_pdf_of_all_ADs__Jun20_.pdf.

Moorcroft and Barrowcliffe et al (2017) *Land-Use Planning & Development Control: Planning For Air Quality v1.2*, IAQM, London, Available: http://iaqm.co.uk/guidance/.

RFL (2021) *Royal Free London's green commitment*, [Online], Available: https://www.royalfree.nhs.uk/news/royal-free-londons-green-commitment.

11 Glossary

AADT	Annual Average Daily Traffic
AQC	Air Quality Consultants
AQMA	Air Quality Management Area
CAZ	Clean Air Zone
CPG	Camden Planning Guidance
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
EV	Electric Vehicle
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
Focus Area	Location that not only exceeds the annual mean limit value for NO_2 but also has a high level of human exposure
GLA	Greater London Authority
HDV	Heavy Duty Vehicles (> 3.5 tonnes)
IAQM	Institute of Air Quality Management
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LB	London Borough
LDV	Light Duty Vehicles (<3.5 tonnes)
LEZ	Low Emission Zone
LPG	London Plan Guidance
µg/m^3	Microgrammes per cubic metre
NO	Nitric oxide
NO_2	Nitrogen dioxide
NOx	Nitrogen oxides (taken to be NO_2 + NO)
NPPF	National Planning Policy Framework

NRMM	Non-road Mobile Machinery
OEP	Office for Environmental Protection
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM_{10}	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
$PM_{2.5}$	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
PPG	Planning Practice Guidance
SPG	Supplementary Planning Guidance
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide
TEB	Transport Emissions Benchmark
TfL	Transport for London
ULEZ	Ultra Low Emission Zone
WHO	World Health Organisation

12 Appendices

A1 Camden Air Quality Planning Checklist

This document is to be completed for all developments that are subject to an Air Quality Assessment (AQA).

Travel and Transport

1) If there will be parking in the development, will electric vehicle charging point/s be included?

   Y/N NA; no parking will be provided for the development

   If yes – please state how many, if no, please state why have they not been included.

2) Will secure cycle storage be provided for users of the building?

   Y/N Yes; there are 163 existing cycle spaces for hospital users and 12 will be added

   If yes – please state how many, if no, please state why have they not been included.

Energy

3) If a CHP is to be included, did you ensure that this technology is suitable for the energy requirements of the building? Please see Camden's Boiler Guidance Manual B for more information.

   Y/N NA; no CHP

   If yes, please briefly summarise why CHP was selected for this site.

4) If CHP is to be included, will it adhere to the GLA CHP Emissions Limits outlined in the *GLA's* Sustainable Design and Construction SPG?

   Y/N – *Please note that it must adhere to these Limits.* NA; no CHP

5) Has the impact of the CHP been modelled within the air quality assessment?

   Y/N – if not please state why. NA; no CHP

   Please note that if CHP modelling was not included due to the fact that the final CHP specification has not been decided, this will need to be clearly stated in the draft AQA, and the potential impact of the CHP will still need to be considered when assessing the exposure of occupants and/or locations of any ventilation inlets, if applicable. If full details of the CHP have not been

included at Planning Application stage, Camden will impose a stringent Planning Condition for the CHP, which will include a requirement for modelling of the impact at all sensitive receptors, as well as a requirement that it adheres to the requirements of the GLA's Sustainable Design and Construction SPG.

Exposure

6) If located in an area of poor air quality and/or next to a busy road or diesel railway line, does the AQA include details of the way in which the building has been designed to reduce the exposure of occupants (e.g. through orientation, greening, placement of residential properties, or, only for developments in areas of very poor air quality, mechanical ventilation?)

Y/N NA; not located in an area of poor air quality

If not, the AQA must be revised to include this information.

Construction Dust

7) Does the project have a Construction Management Plan written in accordance with the recommendations in the Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance, including an assessment of the risk? And, if the risk is Medium or High, a real time monitoring proposal?

Y/N Yes

If not, this must be provided.

Air Quality Neutral

8) Does the AQA include an assessment against the GLA's Air Quality Neutral Standard?

Y/N Yes

If not, this must be included, as outlined in the GLA's Sustainable Design and Construction SPG.

Please return this form with your AQA with your Planning Application

A2 Policy

Air Quality Strategy 2007

A2.1 The Air Quality Strategy (Defra, 2007) published by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK. It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives.

Air Quality Strategy 2023

A2.2 The Air Quality Strategy: Framework for Local Authority Delivery 2023 (Defra, 2023b) sets out the strategic air quality framework for local authorities and other Air Quality Partners in England. It sets out their powers and responsibilities, and actions the Government expects them to take. It does not replace other air quality guidance documents relevant to local authorities.

Clean Air Strategy 2019

A2.3 The Clean Air Strategy (Defra, 2019) sets out a wide range of actions by which the UK Government, in partnership with the Governments of Scotland, Wales and Northern Ireland, will seek to reduce pollutant emissions and improve air quality. Actions are targeted at four main sources of emissions: Transport, Domestic, Farming and Industry. At this stage, there is no straightforward way to take account of the expected future benefits to air quality within this assessment.

Reducing Emissions from Road Transport: Road to Zero Strategy

A2.4 The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper (DfT, 2018) in July 2018 outlining how the government will support the transition to zero tailpipe emission road transport and reduce tailpipe emissions from conventional vehicles during the transition. This paper affirms the Government's pledge to end the sale of new conventional petrol and diesel cars and vans by 2040, and states that the Government expects the majority of new cars and vans sold to be 100% zero tailpipe emission and all new cars and vans to have significant zero tailpipe emission capability by this year, and that by 2050 almost every car and van should have zero tailpipe emissions. It states that the Government wants to see at least 50%, and as many as 70%, of new car sales, and up to 40% of new van sales, being ultra-low emission by 2030.

A2.5 The paper sets out a number of measures by which Government will support this transition, but is clear that Government expects this transition to be industry and consumer led. The Government has recently announced that 80% of new cars and 70% of new vans sold in Great Britain must be zero emission by 2030, increasing to 100% by 2035. If these ambitions are realised then road traffic-related NOx emissions can be expected to reduce significantly over the coming decades.

Environment Act 2021

A2.6 The UK's new legal framework for protection of the natural environment, the Environment Act (2021) passed into UK law in November 2021. The Act gives the Government the power to set long-term, legally binding environmental targets. It also establishes an Office for Environmental Protection (OEP), responsible for holding the Government to account and ensuring compliance with these targets.

A2.7 The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023 No. 96) sets two new targets for future concentrations of $PM_{2.5}$. These targets are described in Paragraph 3.4.

Environmental Improvement Plan 2023

A2.8 Defra published its 25 Year Environment Plan in 2018 (Defra, 2018a). The Environment Act (2021) requires Defra to review this Plan at least every five years. The Environmental Improvement Plan 2023 (Defra, 2023c) is the first revision. This outlines the progress made since 2018 and adds detail to the goals defined in the 2018 Plan, including that of achieving clean air.

A2.9 The Environmental Improvement Plan 2023 sets out the new air quality targets which have been set for concentrations of $PM_{2.5}$. These targets, which are described in more detail in Paragraph 3.4, include the long-term targets in the Statutory Instrument described in Paragraph A2.7, and interim targets to be achieved by 2028.

A2.10 The 2023 Plan outlines the role of local authorities in helping it meet both its targets and existing commitments. It also outlines the respective roles of industry, agricultural sectors, and the DfT in providing the coordinated action required to meet both its new, and pre-existing targets and commitments.

Planning Policy

National Policies

A2.11 The National Planning Policy Framework (NPPF) (Department for Levelling Up, Housing and Communities (DLUHC) , 2023) sets out planning policy for England. It states that the purpose of the planning system is to contribute to the achievement of sustainable development, and that the planning system has three overarching objectives, one of which (Paragraph 8c) is an environmental objective:

"to protect and enhance our natural, built and historic environment; including making effective use of land, improving biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy".

A2.12 To prevent unacceptable risks from air pollution, Paragraph 180 of the NPPF states that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by…preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air quality."

A2.13 Paragraph 191 states:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development".

A2.14 More specifically, on air quality, Paragraph 192 makes clear that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas."

A2.15 The NPPF is supported by Planning Practice Guidance (PPG) (Ministry of Housing, Communities & Local Government, 2019), which includes guiding principles on how planning can take account of the impacts of new development on air quality.

A2.16 The PPG sets out the information that may be required in an air quality assessment, making clear that:

"Assessments need to be proportionate to the nature and scale of development proposed and the potential impacts (taking into account existing air quality conditions), and because of this are likely to be locationally specific".

London-Specific Policies

The London Plan

A2.17 The London Plan (GLA, 2021) sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The key policy relating to air quality is Policy SI 1 on Improving air quality, Part B1 of which sets out three key requirements for developments:

"Development proposals should not:

lead to further deterioration of existing poor air quality

create any new areas that exceed air quality limits, or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits

create unacceptable risk of high levels of exposure to poor air quality".

A2.18 The Policy then details how developments should meet these requirements, stating:

"In order to meet the requirements in Part 1, as a minimum:

development proposals must be at least Air Quality Neutral

development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retro-fitted mitigation measures

major development proposals must be submitted with an Air Quality Assessment. Air quality assessments should show how the development will meet the requirements of B1

development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure".

A2.19 Regarding construction and demolition impacts, Part D of Policy SI 1 of the London Plan states:

"In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance".

A2.20 Part E of Policy SI 1 states the following regarding mitigation and offsetting of emissions:

"Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality

acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development".

London Environment Strategy

A2.21 The London Environment Strategy was published in May 2018 (GLA, 2018a). The strategy considers air quality in Chapter 4; the Mayor's main objective is to create a "*zero emission London by 2050*". Policy 4.2.1 aims to "*reduce emissions from London's road transport network by phasing out fossil fuelled vehicles, prioritising action on diesel, and enabling Londoners to switch to more sustainable forms of transport*". The strategy sets a target to achieve, by 2030, the guideline value for $PM_{2.5}$ which was set by the WHO in 2005. An implementation plan for the strategy has also been published which sets out what the Mayor will do between 2018 and 2023 to help achieve the ambitions in the strategy.

Mayor's Transport Strategy

A2.22 The Mayor's Transport Strategy (GLA, 2018b) sets out the Mayor's policies and proposals to reshape transport in London over the next two decades. The Strategy focuses on reducing car dependency and increasing active sustainable travel, with the aim of improving air quality and creating healthier streets. It notes that development proposals should "*be designed so that walking and cycling are the most appealing choices for getting around locally*".

GLA SPG: The Control of Dust and Emissions During Construction and Demolition

A2.23 The GLA's SPG on The Control of Dust and Emissions During Construction and Demolition (GLA, 2014) outlines a risk assessment based approach to considering the potential for dust generation from a construction site, and sets out what mitigation measures should be implemented to minimise the risk of construction dust impacts, dependent on the outcomes of the risk assessment. This guidance is largely based on the IAQM's guidance (IAQM, 2024), and it states that "*the latest version of the IAQM Guidance should be used*".

GLA LPG: Air Quality Neutral

A2.24 The GLA's Air Quality Neutral LPG outlines the assessment approach for determining whether a development is Air Quality Neutral (GLA, 2023a). The guidance sets out benchmarks for the maximum allowable emissions of NOx and particulate matter based on the size and use class of the proposed development. To determine whether the development is Air Quality Neutral, the building and transport emissions from the proposed development are compared to these benchmarks.

Air Quality Focus Areas

A2.25 The GLA has identified 160 air quality Focus Areas in London. These are locations that not only exceed the annual mean limit value for NO_2, but also have high levels of human exposure. They do not represent an exhaustive list of London's air quality hotspot locations, but locations where the GLA believes the problem to be most acute. They are also areas where the GLA considers there to be the most potential for air quality improvements and are, therefore, where the GLA and Transport for London (TfL) will focus actions to improve air quality. The proposed development is not located within any of the air quality Focus Areas.

Local Transport Plan

A2.26 Camden's Transport Strategy Action Plan was published in 2019 (LB of Camden, 2019) with the aim to "*work alongside residents and partners in transforming transport and mobility in Camden, enabling and encouraging people to travel sustainably; nurturing healthier lifestyles; creating radically less*

polluted places; and upgrading the transport network to meets Camden's needs and those of London as a growing capital city".

A2.27 Air quality is also specifically referenced in Policy 5c: *"Use air quality indicators (PM_{10} and NOx emissions levels) as key factors in prioritising locations for LIP-funding through our Area-wide Healthy Streets Projects"*, and Policy 5h: *"Where feasible and appropriate, we will monitor the impact of our highways/streetscape schemes using air quality monitoring, including (for example) the use of diffusion tubes to monitor Nitrogen Dioxide levels pre- and post- implementation".*

Local Policies

A2.28 The LB of Camden Local Plan (LB of Camden, 2017), was adopted in 2017. The Plan sets out the Borough's planning policies, covering the period from 2016-2031. Policy CC4, on Air Quality, states that:

"The Council will ensure that the impact of development on air quality is mitigated and ensure that exposure to poor air quality is reduced in the borough.

The Council will take into account the impact of air quality when assessing development proposals, through the consideration of both the exposure of occupants to air pollution and the effect of the development on air quality. Consideration must be taken to the actions identified in the Council's Air Quality Action Plan.

Air Quality Assessments (AQAs) are required where development is likely to expose residents to high levels of air pollution. Where the AQA shows that a development would cause harm to air quality, the Council will not grant planning permission unless measures are adopted to mitigate the impact. Similarly, developments that introduce sensitive receptors (i.e. housing, schools) in locations of poor air quality will not be acceptable unless designed to mitigate the impact.

Development that involves significant demolition, construction or earthworks will also be required to assess the risk of dust and emissions impacts in an AQA and include appropriate mitigation measures to be secured in a Construction Management Plan."

A2.29 In support of Policy CC4, the Local Plan also includes Policy T2 which requires that *"all new developments in the borough be car free".*

A2.30 Policy A1 on Managing the Impact of Development states that: *"The Council will seek to protect the quality of life of occupiers and neighbours"* and will *"seek to ensure that the amenity of communities, occupiers and neighbours is protected…and require mitigation measures where necessary. Factors that we will consider include…impacts of the construction phase, including the use of Construction Management Plans…odours, fumes and dust".*

A2.31 Policy D1 on Design has implications for air quality as well:

"The Council will seek to secure high quality design in development. The Council will require that development […]

c. is sustainable in design and construction, incorporating best practice in resource management and climate change mitigation and adaptation […]

h. promotes health;

The Council will resist development of poor design that fails to take the opportunities available for improving the character and quality of an area and the way it functions…"

A2.32 The plan elaborates that *"architecture and urban design can affect human health through the quality and design of buildings and spaces, access to open space and nature, air quality, noise, opportunity for active transport such as walking and cycling, crime reduction social cohesion."*

A2.33 LB of Camden has also recently commenced consultation on a new Draft Local Plan (Regulation 18) (LB of Camden, 2024b). Policy A3 (Air Quality) outlines a number of requirements for new developments including for all developments to be at least air quality neutral, to use design solutions to reduce exposure to existing poor air quality and to consider emergency backup power for development sites early in the design process.

A2.34 To support the current Camden Local Plan, the Borough has published a CPG document (LB of Camden, 2021), specifically pertaining to air quality, which forms a Supplementary Planning Document (SPD). The CPG states that:

"All developments are to protect future occupants from exposure to poor air quality; and

All developments are to limit their impact on local air quality and be at least air quality neutral."

A2.35 The CPG describes air quality in the borough and measures to minimise emissions. The CPG references the 2005 WHO guidelines for NO_2, PM_{10}, and $PM_{2.5}$ of 40 µg/m^3, 20 µg/m^3 and 10 µg/m^3 respectively which Camden aims to achieve by 2030. The CPG also states that *"for the determination of planning applications and appraisal of Construction Management Plans, consideration must be paid to uncertainty in NO_2 data, therefore 38 µg/m^3 (the 40 µg/m^3 WHO limit less 5%) shall be taken as the limit for this pollutant."*

Building Standards

A2.36 Part F(1) of Schedule 1 of the Building Regulations 2010 as amended June 2022 (Ministry of Housing, Communities & Local Government, 2022) places a duty on building owners, or those responsible for relevant building work[8], to ensure adequate ventilation is provided to building occupants.

A2.37 Approved Document F (HM Government, 2021), which accompanies the Building Regulations, explains that care should be taken to minimise entry of external air pollutants. Specific steps should be taken to manage ventilation intakes where the building is near to a significant source of emissions, or if local ambient concentrations exceed values set in the Air Quality Standards Regulations 2010. These steps include maximising the distance between emission source and air intake, considering likely dispersion patterns, and considering the timing of pollution releases when designing the ventilation system.

A2.38 Table 1.1 in Approved Document F collates guidance and regulation documents for a range of use classes that have bespoke ventilation requirements, including hospitals. NHS guidance is signposted in Table 1.1 of Approved Document F, which outlines the level of filtration required, and in the case of Air Handling Units (AHUs), specifically states:

"For AHUs, provided that each filter's pressure drop is monitored by a sensor linked to the BMS, direct reading gauges or manometers will not be required. Capped pressure tappings should be provided so that a portable manometer can be connected for diagnostic purposes when necessary" (Department for Health, 2021).

A2.39 Compliance with the Building Regulations is not required for planning approval, but it is assumed that the Regulations will be complied with in the completed development.

[8] Building work is a legal term for work covered by the Building Regulations. With limited exemptions, the Regulations apply to all significant building work, including erecting or extending a building.

Air Quality Action Plans

National Air Quality Plan

A2.40 Defra has produced an Air Quality Plan to tackle roadside NO_2 concentrations in the UK (Defra, 2017); a supplement to the 2017 Plan (Defra, 2018b) was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the limit value were identified. This assessment has principally been carried out in relation to the air quality objectives, rather than the limit values that are the focus of the Air Quality Plan.

Local Air Quality Action Plan

A2.41 LB of Camden's combined Clean Air Strategy and Clean Air Action Plan (LB of Camden, 2022) sets out the strategic objectives for improving air quality in the Borough between 2019 and 2034 and the actions that will be undertaken between 2023 and 2026 to support the strategic objectives.

A2.42 One of the Clean Air Strategy's key commitments is "*achieving the most stringent evidence-based air quality targets available, in as short a timeframe as possible. Currently these are the World Health Organization's (WHO) air quality guidelines, published in 2021*" of 10 µg/m^3 for NO_2 by 2034, 15 µg/m^3 for PM_{10} by 2030 and 5 µg/m^3 for $PM_{2.5}$ by 2034. These are more stringent than those published in the Air Quality CPG (see Paragraph A2.35), which are based on the 2005 WHO guidelines and which are recommended for use "*for the determination of planning applications and appraisal of Construction Management Plans*" (LB of Camden, 2021).

A2.43 The CAAP also states '*We will explore all available opportunities to reduce and prevent the installation and operation of any further diesel backup generators in Camden, instead requiring or mandating the use of cleaner alternatives such as electric battery storage systems, additional mains power connections. Where non-fossil fuel power systems are not viable, we will enforce the use of the cleanest and most efficient generators available, avoidance of over-sized generators, with the minimum possible number of hours of routine testing, and with a requirement to avoid testing at times of forecast or current high levels of air pollution*."

A2.44 The CAAP contains 36 'Clean Air Outcomes' to help improve air quality and protect health in Camden. The Plan sets out seven themes, around which a number of actions have been developed in order to improve local air quality:

- reducing construction emissions;
- reducing building emissions;
- reducing transport emissions;
- supporting communities and schools;
- indirect emissions and lobbying;
- public health and awareness; and
- indoor air quality and occupational exposure.

A2.45 Under the theme of 'communities and schools', action 18 seeks to reduce exposure outside hospitals and health centres. The CAAP proposes to do so by:

- installing anti-idling traffic signage where possible; and

- working with the NHS and public health to promote and support anti-idling campaigns and other awareness-raising events about vehicle pollution around hospitals.

A2.46 The RFL Hospital has also established its own green commitment (RFL, 2021)to play its part in helping the NHS to reach net zero carbon emissions by 2040. It has outlined a number of measures to be implemented, including:

- *"We will improve local air quality by having RFL anti-idling policy in place and awareness raising";*
- *"We will expand our cycle parking spaces and EV charging points for staff and visitors";*
- *"We will implement cleaner vehicles in our decontamination unit - 50% of our fleet and 75% of our factory forklift trucks will be electric";* and
- *"We will support our staff through advice and education. We will encourage them to take practical steps to reduce carbon footprint in their daily activities at home/work and improve their carbon literacy".*

A3 EPUK & IAQM Planning for Air Quality Guidance

A3.1 The guidance issued by EPUK and IAQM (Moorcroft and Barrowcliffe et al, 2017) is comprehensive in its explanation of the place of air quality in the planning regime. Key sections of the guidance not already mentioned above are set out below.

Air Quality as a Material Consideration

A3.2 *"Any air quality issue that relates to land use and its development is capable of being a material planning consideration. The weight, however, given to air quality in making a planning application decision, in addition to the policies in the local plan, will depend on such factors as:*

- *the severity of the impacts on air quality;*
- *the air quality in the area surrounding the proposed development;*
- *the likely use of the development, i.e. the length of time people are likely to be exposed at that location; and*
- *the positive benefits provided through other material considerations".*

Recommended Best Practice

A3.3 The guidance goes into detail on how all development proposals can and should adopt good design principles that reduce emissions and contribute to better air quality management. It states:

"The basic concept is that good practice to reduce emissions and exposure is incorporated into all developments at the outset, at a scale commensurate with the emissions".

A3.4 The guidance sets out a number of good practice principles that should be applied to all developments that:

- include 10 or more dwellings;
- where the number of dwellings is not known, residential development is carried out on a site of more than 0.5 ha;
- provide more than 1,000 m^2 of commercial floorspace;
- are carried out on land of 1 ha or more.

A3.5 The good practice principles are that:

- New developments should not contravene the Council's Air Quality Action Plan, or render any of the measures unworkable;
- Wherever possible, new developments should not create a new "street canyon", as this inhibits pollution dispersion;
- Delivering sustainable development should be the key theme of any application;
- New development should be designed to minimise public exposure to pollution sources, e.g. by locating habitable rooms away from busy roads;

- The provision of at least 1 Electric Vehicle (EV) "rapid charge" point per 10 residential dwellings and/or 1000 m^2 of commercial floorspace. Where on-site parking is provided for residential dwellings, EV charging points for each parking space should be made available;
- Where development generates significant additional traffic, provision of a detailed travel plan (with provision to measure its implementation and effect) which sets out measures to encourage sustainable means of transport (public, cycling and walking) via subsidised or free-ticketing, improved links to bus stops, improved infrastructure and layouts to improve accessibility and safety;
- All gas-fired boilers to meet a minimum standard of <40 mgNOx/kWh;
- Where emissions are likely to impact on an AQMA, all gas-fired CHP plant to meet a minimum emissions standard of:

    ix) Spark ignition engine: 250 mgNOx/Nm^3;

    x) Compression ignition engine: 400 mgNOx/Nm^3;

    xi) Gas turbine: 50 mgNOx/Nm^3.

A3.6 A presumption should be to use natural gas-fired installations. Where biomass is proposed within an urban area it is to meet minimum emissions standards of 275 mgNOx/Nm^3 and 25 mgPM/Nm^3.

A3.7 The guidance also outlines that offsetting emissions might be used as a mitigation measure for a proposed development. However, it states that:

"It is important that obligations to include offsetting are proportional to the nature and scale of development proposed and the level of concern about air quality; such offsetting can be based on a quantification of the emissions associated with the development. These emissions can be assigned a value, based on the "damage cost approach" used by Defra, and then applied as an indicator of the level of offsetting required, or as a financial obligation on the developer. Unless some form of benchmarking is applied, it is impractical to include building emissions in this approach, but if the boiler and CHP emissions are consistent with the standards as described above then this is not essential".

A3.8 The guidance offers a widely used approach for quantifying costs associated with pollutant emissions from transport. It also outlines the following typical measures that may be considered to offset emissions, stating that measures to offset emissions may also be applied as post assessment mitigation:

- Support and promotion of car clubs;
- Contributions to low emission vehicle refuelling infrastructure;
- Provision of incentives for the uptake of low emission vehicles;
- Financial support to low emission public transport options; and
- Improvements to cycling and walking infrastructures.

Screening

Impacts of the Local Area on the Development

"There may be a requirement to carry out an air quality assessment for the impacts of the local area's emissions on the proposed development itself, to assess the exposure that residents or users might experience. This will need to be a matter of judgement and should take into account:

- the background and future baseline air quality and whether this will be likely to approach or exceed the values set by air quality objectives;
- the presence and location of Air Quality Management Areas as an indicator of local hotspots where the air quality objectives may be exceeded;
- the presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular NO_2), that would cause unacceptably high exposure for users of the new development; and
- the presence of a source of odour and/or dust that may affect amenity for future occupants of the development".

Impacts of the Development on the Local Area

A3.9 The guidance sets out two stages of screening criteria that can be used to identify whether a detailed air quality assessment is required, in terms of the impact of the development on the local area. The first stage is that you should proceed to the second stage if any of the following apply:

- 10 or more residential units or a site area of more than 0.5 ha residential use; and/or
- more than 1,000 m^2 of floor space for all other uses or a site area greater than 1 ha.

A3.10 Coupled with any of the following:

- the development has more than 10 parking spaces; and/or
- the development will have a centralised energy facility or other centralised combustion process.

A3.11 If the above do not apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area. If they do apply then you proceed to stage 2, which sets out indicative criteria for requiring an air quality assessment. The stage 2 criteria relating to vehicle emissions are set out below:

- the development will lead to a change in LDV flows of more than 100 AADT within or adjacent to an AQMA or more than 500 AADT elsewhere;
- the development will lead to a change in HDV flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere;
- the development will lead to a realigning of roads (i.e. changing the proximity of receptors to traffic lanes) where the change is 5m or more and the road is within an AQMA;
- the development will introduce a new junction or remove an existing junction near to relevant receptors, and the junction will cause traffic to significantly change vehicle acceleration/deceleration, e.g. traffic lights or roundabouts;

- the development will introduce or change a bus station where bus flows will change by more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere; and
- the development will have an underground car park with more than 100 movements per day (total in and out) with an extraction system that exhausts within 20 m of a relevant receptor.

A3.12 The criteria are more stringent where the traffic impacts may arise on roads where concentrations are close to the objective. The presence of an AQMA is taken to indicate the possibility of being close to the objective, but where whole authority AQMAs are present and it is known that the affected roads have concentrations below 90% of the objective, the less stringent criteria are likely to be more appropriate.

A3.13 On combustion processes (including standby emergency generators and shipping) where there is a risk of impacts at relevant receptors, the guidance states that:

"Typically, any combustion plant where the single or combined NOx emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. As a guide, the 5 mg/s criterion equates to a 450 kW ultra-low NOx gas boiler or a 30kW CHP unit operating at <95mg/Nm^3.

In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates.

Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable".

A3.14 Should none of the above apply then the development can be screened out as not requiring a detailed air quality assessment of the impact of the development on the local area, provided that professional judgement is applied; the guidance importantly states the following:

"The criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality".

A3.15 Even if a development cannot be screened out, the guidance is clear that a detailed assessment is not necessarily required:

"The use of a Simple Assessment may be appropriate, where it will clearly suffice for the purposes of reaching a conclusion on the significance of effects on local air quality. The principle underlying this guidance is that any assessment should provide enough evidence that will lead to a sound conclusion on the presence, or otherwise, of a significant effect on local air quality. A Simple Assessment will be appropriate, if it can provide this evidence. Similarly, it may be possible to conduct a quantitative assessment that does not require the use of a dispersion model run on a computer".

A3.16 The guidance also outlines what the content of the air quality assessment should include, and this has been adhered to in the production of this report.

Assessment of Significance

A3.17 There is no official guidance in the UK in relation to development control on how to describe the nature of air quality impacts, nor how to assess their significance. The approach within the EPUK/IAQM guidance has, therefore, been used in this assessment. This approach involves a two stage process:

- a qualitative or quantitative description of the impacts on local air quality arising from the development; and
- a judgement on the overall significance of the effects of any impacts.

A3.18 The guidance recommends that the assessment of significance should be based on professional judgement, with the overall air quality impact of the development described as either 'significant' or 'not significant'. In drawing this conclusion, the following factors should be taken into account:

- the existing and future air quality in the absence of the development;
- the extent of current and future population exposure to the impacts;
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts;
- the potential for cumulative impacts and, in such circumstances, several impacts that are described as '*slight*' individually could, taken together, be regarded as having a significant effect for the purposes of air quality management in an area, especially where it is proving difficult to reduce concentrations of a pollutant. Conversely, a '*moderate*' or '*substantial*' impact may not have a significant effect if it is confined to a very small area and where it is not obviously the cause of harm to human health; and
- the judgement on significance relates to the consequences of the impacts; will they have an effect on human health that could be considered as significant? In the majority of cases, the impacts from an individual development will be insufficiently large to result in measurable changes in health outcomes that could be regarded as significant by health care professionals.

A3.19 The guidance is clear that other factors may be relevant in individual cases. It also states that the effect on the residents of any new development where the air quality is such that an air quality objective is not met will be judged as significant. For people working at new developments in this situation, the same will not be true as occupational exposure standards are different, although any assessment may wish to draw attention to the undesirability of the exposure.

A3.20 A judgement of the significance should be made by a competent professional who is suitably qualified. A summary of the professional experience of the staff contributing to this assessment is provided in Appendix A6.

A4 Construction Dust Assessment Procedure

A4.1 The criteria developed by IAQM (2024), upon which the GLA's guidance is based, divide the activities on construction sites into four types to reflect their different potential impacts. These are:

- demolition;
- earthworks;
- construction; and
- trackout.

A4.2 The assessment procedure includes the four steps summarised below:

STEP 1: Screen the Need for a Detailed Assessment

A4.3 An assessment is required where there is a human receptor within 250 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s), or where there is an ecological receptor within 50 m of the boundary of the site and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

A4.4 Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is *negligible* and that any effects will be 'not significant'. No mitigation measures beyond those required by legislation will be required.

STEP 2: Assess the Risk of Dust Impacts

A4.5 A site is allocated to a risk category based on two factors:

- the scale and nature of the works, which determines the potential dust emission magnitude (Step 2A); and
- the sensitivity of the area to dust effects (Step 2B).

A4.6 These two factors are combined in Step 2C, which is to determine the risk of dust impacts with no mitigation applied. The risk categories assigned to the site may be different for each of the four potential sources of dust (demolition, earthworks, construction and trackout).

Step 2A – Define the Potential Dust Emission Magnitude

A4.7 Dust emission magnitude is defined as either 'Small', 'Medium', or 'Large'. The IAQM guidance explains that this classification should be based on professional judgement, but provides the examples in Table A4-1.

Table A4-1: Examples of How the Dust Emission Magnitude Class May be Defined

Class	Examples
Demolition	
Large	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on site crushing and screening, demolition activities >12 m above ground level

Class	Examples
Medium	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level
Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	
Large	Total site area >110,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry to due small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height.
Medium	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3 m – 6 m in height.
Small	Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height.
Construction	
Large	Total building volume >75,000 m^3, on site concrete batching; sandblasting
Medium	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching
Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout [a]	
Large	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m
Medium	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m
Small	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m

[a] These numbers are for vehicles that leave the site after moving over unpaved ground.

Step 2B – Define the Sensitivity of the Area

A4.8 The sensitivity of the area is defined taking account of a number of factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of those receptors;
- in the case of PM_{10}, the local background concentration; and
- site-specific factors, such as whether there are natural shelters to reduce the risk of wind-blown dust.

A4.9 The first requirement is to determine the specific sensitivities of local receptors. The IAQM guidance recommends that this should be based on professional judgment, taking account of the principles in Table A4-2. These receptor sensitivities are then used in the matrices set out in Table A4-3, Table A4-4 and Table A4-5 to determine the sensitivity of the area. Finally, the sensitivity of the area is considered

in relation to any other site-specific factors, such as the presence of natural shelters etc., and any required adjustments to the defined sensitivities are made.

Step 2C – Define the Risk of Impacts

A4.10 The dust emission magnitude determined at Step 2A is combined with the sensitivity of the area determined at Step 2B to determine the *risk* of impacts with no mitigation applied. The IAQM guidance provides the matrix in Table A4-6 as a method of assigning the level of risk for each activity.

STEP 3: Determine Site-specific Mitigation Requirements

A4.11 The IAQM guidance provides a suite of recommended and desirable mitigation measures which are organised according to whether the outcome of Step 2 indicates a low, medium, or high risk. The list provided in the IAQM guidance has been used as the basis for the requirements set out in Appendix A5.

STEP 4: Determine Significant Effects

A4.12 The IAQM guidance does not provide a method for assessing the significance of effects before mitigation, and advises that pre-mitigation significance should not be determined. With appropriate mitigation in place, the IAQM guidance is clear that the residual effect will normally be 'not significant'.

A4.13 The IAQM guidance recognises that, even with a rigorous dust management plan in place, it is not possible to guarantee that the dust mitigation measures will be effective all of the time, for instance under adverse weather conditions. The local community may therefore experience occasional, short-term dust annoyance. The scale of this would not normally be considered sufficient to change the conclusion that the effects will be 'not significant'.

Table A4-2: Principles to be Used When Defining Receptor Sensitivities

Class	Principles	Examples
Sensitivities of People to Dust Soiling Effects		
High	users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land	dwellings, museum and other culturally important collections, medium and long term car parks and car showrooms
Medium	users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or the appearance, aesthetics or value of their property could be diminished by soiling; or the people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land	parks and places of work
Low	the enjoyment of amenity would not reasonably be expected; or there is property that would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or there is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land	playing fields, farmland (unless commercially-sensitive horticulture), footpaths, short term car parks and roads
Sensitivities of People to the Health Effects of PM_{10}		
High	locations where members of the public may be exposed for eight hours or more in a day	residential properties, hospitals, schools and residential care homes
Medium	locations where the people exposed are workers, and where individuals may be exposed for eight hours or more in a day.	may include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}
Low	locations where human exposure is transient	public footpaths, playing fields, parks and shopping streets
Sensitivities of Receptors to Ecological Effects		
High	locations with an international or national designation and the designated features may be affected by dust soiling; or locations where there is a community of a particularly dust sensitive species	Special Areas of Conservation with dust sensitive features
Medium	locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition	Sites of Special Scientific Interest with dust sensitive features

Class	Principles	Examples
Low	locations with a local designation where the features may be affected by dust deposition	Local Nature Reserves with dust sensitive features

Table A4-3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table A4-4: Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual Mean PM_{10}	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10}	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table A4-5: Sensitivity of the Area to Ecological Effects

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Table A4-6: Defining the Risk of Dust Impacts

Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Construction			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible
Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

A5 Construction Mitigation

A5.1 Table A5-1 presents a set of best-practice measures from the GLA guidance (GLA, 2014) that should be incorporated into the specification for the works. These measures should be written into a Dust Management Plan. Some of the measures may only be necessary during specific phases of work, or during activities with a high potential to produce dust, and the list should be refined and expanded upon in liaison with the construction contractor when producing the Dust Management Plan.

Table A5-1: Best-Practice Mitigation Measures Recommended for the Works

Measure	Desirable	Highly Recommended
Site Management		
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site		✓
Develop a Dust Management Plan (DMP)		✓
Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary		✓
Display the head or regional office contact information		✓
Record and respond to all dust and air quality pollutant emissions complaints		✓
Make a complaints log available to the local authority when asked		✓
Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the Local Authority when asked		✓
Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions are being carried out and during prolonged dry or windy conditions		✓
Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and ensure that the action taken to resolve the situation is recorded in the log book		✓
Preparing and Maintaining the Site		
Plan the site layout so that machinery and dust-causing activities are located away from receptors, as far as is possible		✓
Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site		✓

Measure	Desirable	Highly Recommended
Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period		✓
Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution	✓	
Avoid site runoff of water or mud		✓
Keep site fencing, barriers and scaffolding clean using wet methods		✓
Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below		✓
Cover, seed, or fence stockpiles to prevent wind whipping		✓
Carry out regular dust soiling checks of buildings within 100 m of site boundary and provide cleaning if necessary	✓	
Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly		✓
Agree monitoring locations with the Local Authority		✓
Where possible, commence baseline monitoring at least three months before work begins		✓
Operating Vehicle/Machinery and Sustainable Travel		
Ensure all on-road vehicles comply with the requirements of the London LEZ (and ULEZ)		✓
Ensure all Non-road Mobile Machinery (NRMM) comply with London's NRMM emission standards. From January 2025, NRMM used anywhere in London will be required to meet Stage IV, while from January 2030 the Stage V standard will apply. From January 2040 only zero emission machinery will be allowed.		✓
Ensure all vehicles switch off engines when stationary – no idling vehicles		✓
Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery-powered equipment where practicable		✓
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials		✓
Implement a Travel Plan that supports and encourages sustainable staff travel (public transport, cycling, walking, and car-sharing)		✓
Operations		
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as		✓

Measure	Desirable	Highly Recommended
water sprays or local extraction, e.g. suitable local exhaust ventilation systems		
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate		✓
Use enclosed chutes, conveyors and covered skips		✓
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate		✓
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods		✓
Waste Management		
Reuse and recycle waste to reduce dust from waste materials		✓
Avoid bonfires and burning of waste materials		✓
Measures Specific to Demolition		
Ensure water suppression is used during demolition operations.		✓
Avoid explosive blasting, using appropriate manual or mechanical alternatives		✓
Bag and remove any biological debris or damp down such material before demolition		✓
Measures Specific to Construction		
Avoid scabbling (roughening of concrete surfaces), if possible	✓	
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place	✓	
Measures Specific to Trackout		
Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site	✓	
Avoid dry sweeping of large areas	✓	
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport	✓	

A6 Professional Experience

Penny Wilson, BSc (Hons) CSci MIEnvSc MIAQM

Ms Wilson is a Technical Director with AQC, with more than 20 years' relevant experience in the field of air quality. She has been responsible for numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including dust and odour nuisance. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning and DCO applications. She has provided expert evidence to a number of Public Inquiries and civil court, and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

Dr Frances Marshall, MSci PhD MIEnvSc MIAQM

Dr Marshall is a Principal Consultant with AQC with ten years' relevant experience. Prior to joining AQC, she spent four years carrying out postgraduate research into atmospheric aerosols at the University of Bristol. Dr Marshall has experience preparing air quality assessments for a range of projects, including residential and commercial developments, road traffic schemes, energy centres, energy from waste schemes and numerous power generation schemes. She has experience in producing air quality assessments for EIA schemes, and has also assessed the impacts of Local Plans on designated ecological areas, prepared Annual Status Reports for Local Authorities, and undertaken diffusion tube monitoring studies. She is a Member of both the Institute of Air Quality Management and the Institution of Environmental Sciences.

Dr Helen Robinson, BSc (Hons) MSc PhD MIEnvSc MIAQM

Dr Robinson is a Senior Consultant with AQC with three years of industry experience. Dr Robinson has experience in preparing air quality assessments for a range of projects, including residential and commercial developments, road traffic schemes and energy centres. She has also prepared Annual Status Reports and Air Quality Action Plans for Local Authorities, and undertaken monitoring studies using diffusion tubes and real-time particle monitors. Prior to joining AQC she was based at the University of Birmingham, completing a BSc in Geography, MSc in Applied Meteorology and Climatology, and PhD in Air Quality. Her PhD research specialised in air quality modelling where she developed a range of tools to estimate real-time pollutant concentrations on Birmingham's road network, and to quantify the impacts of Low Traffic Neighbourhoods on residential population exposure. Additionally, she provided the air quality modelling expertise on the NERC-funded project, 'GI4RAQ' (Green Infrastructure for Roadside Air Quality), to quantitively assess the impacts of 'green' interventions in street environments. She is a Member of both the Institute of Air Quality Management and the Institution of Environmental Sciences.

London • Bristol • Warrington • Brussels