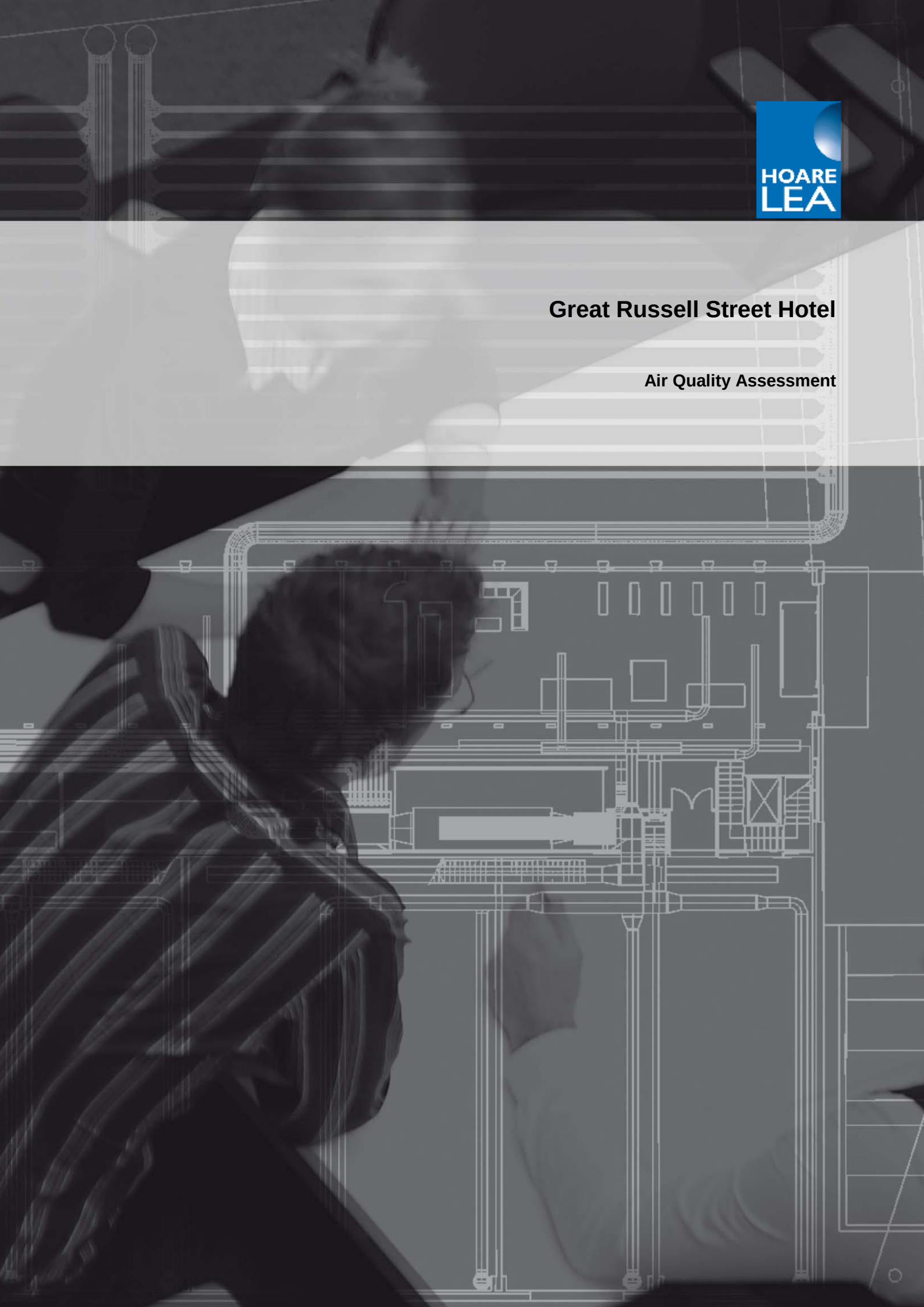

Great Russell Street Hotel

Air Quality Assessment

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Audit Sheet

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1.0 Executive Summary

This report describes the potential air quality impacts associated with the proposed redevelopment of an underground NCP car park, located at 112 Great Russell Street, in the London Borough of Camden. It is proposed that two floors of the car park be converted into a budget hotel.

The air quality impacts during the construction and the operational phases have been assessed. The construction works consist primarily of refurbishment of the existing underground space and the risk of impacts is considered to be low. However, to ensure that there are no significant impacts, mitigation measures commensurate with the risk have been recommended.

As the proposed development will result in less traffic than the current use and an air source heat pump is proposed for space and water heating, there will be no adverse impact on air quality in the surrounding area. The site lies within an Air Quality Management Area where background annual mean nitrogen dioxide (NO_2) concentrations exceed the national air quality objective. The air intake for the hotel ventilation system will be drawn from ground level at the building's Adeline Place façade, and future hotel guests could be exposed to unacceptable air quality. To mitigate this impact it is proposed that the air intake is treated to remove NO_2. The PM_{10} objectives are unlikely to be exceeded in the vicinity of the air intake.

Subject to these mitigation measures being applied the residual effects are considered to be **not significant**.

2.0 Introduction

This report describes the potential air quality impacts associated with the construction and operational phases of the proposed redevelopment of an underground NCP car park located at 112 Great Russell Street, in the London Borough of Camden. It is proposed that two basement floors of the car park be converted into a budget hotel.

The site is bound to the west by Tottenham Court Road, to the south by Great Russell Street, to the east by Adeline Place and to the north by Bedford Avenue. The site entrances are located on Great Russell Street and Adeline Place. Tottenham Court Road is approximately 80 metres (m) west of the junction of Great Russell Street and Adeline Place, and Bloomsbury Street is approximately 150 m to the east. The site is surrounded by hotels, offices and small retail developments, with major retail on Tottenham Court Road. Immediately above the site is St Giles Hotel which is accessed from Bedford Avenue. There is also a YMCA which is accessed from Great Russell Street, adjacent to the pedestrian entrance to the car park. To the east, there are hotels on Great Russell Street. The site is well located with excellent accessibility by public transport, walking and cycling.

The proposed development is situated within an Air Quality Management Area (AQMA), declared by the London Borough (LB) of Camden for exceedances of the nitrogen dioxide (NO_2) and fine particulate matter (PM_{10}) objectives.

The proposed redevelopment involves the refurbishment of basement levels -4 and -5 of the car park. The air intake for the proposed hotel's ventilation system will be from Adeline Place, at street level, as indicated in Annex 2. Further detail in relation to the location of the air intake is provided by the submitted drawings as part of this planning application, specifically drawing 2897/P/17RevD 'Proposed Elevations'. The proposed hotel would provide budget accommodation with no ancillary facilities such as restaurants, bars, cafes or conference rooms. No car parking is proposed on site.

As the proposed development will result in less traffic than the current use and an air source heat pump is proposed for space and water heating, there will be no adverse impact from the proposed development on air quality in the surrounding area. However, as it is an AQMA, this assessment has considered whether future hotel guests are likely to be exposed to unacceptable air quality.

The impacts of construction works proposed have also been assessed, however these are minimal as works consist mostly of refurbishment underground.

3.0 Legislation, Policy and Guidance Documents

3.1 Air Quality

Air Quality Strategy and Local Air Quality Management

The Air Quality Strategy (Defra, 2007) provides the policy framework for air quality management and assessment in the UK. It sets out the 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. Local authorities are seen to play a particularly important role.

The strategy describes the Local Air Quality Management (LAQM) regime which was established by the Environment Act 1995. Local authorities are required to carry out regular reviews and assessments of air quality in their areas to identify whether the objectives have been, or will be, achieved at relevant locations, by the applicable date. If the objectives are not achieved, the authority must declare an Air Quality Management Area (AQMA), and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations, 2000 and the Air Quality (England) (Amendment) Regulations 2002.

The objectives for NO_2 and PM_{10} are set out in Table 1 and were to have been achieved by 2005 and 2004 respectively, and continue to apply in all future years thereafter. The $PM_{2.5}$ objective is to be achieved by 2020. Measurements across the UK have shown that the 1-hour NO_2 objective is unlikely to be exceeded where the annual mean concentration is below 60 mg/m^3.

Table 1 Air Quality Objectives for Nitrogen Dioxide, PM_{10} and $PM_{2.5}$

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour Mean	200 mg/m^3 not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3
Fine Particles (PM_{10})	24-hour Mean	50 mg/m^3 not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m^3
Fine Particles ($PM_{2.5}$)*	Annual Mean	25 µg/m^3

* The $PM_{2.5}$ objective, which is to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. The EU limit value is the same, but is to be met by 2015.

The objectives apply at locations where members of the public are likely to be regularly present and exposed over the averaging period of the objective. The annual mean objectives for NO_2 and PM_{10} are considered to apply at the façades of residential properties, schools, hospitals etc. and should generally not apply at hotels unless people live there as their permanent residence. The 24-hour objective for PM_{10} is considered to apply at the same locations as the annual mean objective, as well as in gardens of residential properties and also 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.

The European Union has also set limit values for NO_2, PM_{10} and $PM_{2.5}$. Achievement of these values is a national obligation rather than a local requirement. The limit values for NO_2 are the same as the English objectives, but apply from 2010 (The Air Quality Standards Regulations (No. 1001), 2010). The limit values for PM_{10} and $PM_{2.5}$ are also the same as the English objectives, but apply from 2005 for PM_{10} and from 2015 for $PM_{2.5}$. Where Member States have difficulty achieving compliance they may apply to the European Commission for a time extension for up to five years. Defra has estimated that the Greater London agglomeration will not comply with the NO_2 annual mean limit value until after 2030.

The Mayor's Air Quality Strategy

The most recent Mayor's Air Quality Strategy (MAQS) for London was published in December 2010. The overarching aim of the Strategy is to reduce pollution concentrations in London to achieve compliance with the EU limit values as soon as possible. The Strategy commits to the continuation of measures identified in the 2002 MAQS, and sets out a series of additional measures.

Policy 7 specifically relates to using the planning process to improve air quality, detailing that the Mayor will ensure that new developments in London shall as a minimum be 'air quality neutral' through the adoption of best practice in the management and mitigation of emissions. Specific proposals within this policy are set below:

- Develop a checklist to guide boroughs and developers in the assessment of the potential emissions from new developments.
- Minimise increased exposure to existing poor air quality, particularly within AQMAs or where a development is likely to be used by a large number of people who are particularly vulnerable to poor air quality.
- Ensure air quality benefits are realised through developer contributions and mitigation measures as secured through planning conditions, section 106 agreements or the Community Infrastructure Levy, where appropriate.
- Provide guidance for boroughs in producing their Supplementary Planning Documents on air quality to assist them in determining planning applications.

The output from this policy is to ensure that measures to improve air quality are embedded in the planning process.

Camden Council

Camden Council has declared an Air Quality Management Area (AQMA) for the whole of the Borough for both NO_2 and PM_{10}.

An Air Quality Action Plan 2013 – 2015 was published in January 2013, which contains a number of actions and measures. The plan introduces a number of measures to improve air quality and has listed a number of actions to help reduce the key air pollutants in Camden, NO_2 and PM_{10} from traffic, boilers and other sources. These actions are separated into key sections that include reducing transport emissions, reducing emissions associated with new developments, reducing emissions from gas boilers and industrial processes and lobbying and partnership working.

Guidance on the Assessment of Dust from Demolition and Construction

The Institute of Air Quality Management (IAQM) produced a guidance document on the assessment of dust from demolition and construction in 2014. This document is designed to provide guidance for developers, their consultants and environmental health practitioners on how to undertake a construction impact assessment (including demolition and earthworks as appropriate).

Environmental Protection UK

Guidance produced by Environmental Protection UK (EPUK), entitled Development Control: Planning for Air Quality (2010 Update), aims to ensure that air quality is properly accounted for in the development control process. The main focus of the guidance is the impact of traffic emissions. One of the key elements is advice on describing air quality impacts and assessment of their significance. This guidance is being updated in association with the Institute of Air Quality Management with a revised document due to be published in late April/May 2015. The 2015 guidance is unlikely to make a material difference to the conclusions of this assessment.

3.2 Planning

National Planning Policy Framework

The National Planning Policy Framework (NPPF) 2012 sets out planning policy for the UK. It includes advice on when air quality should be a material consideration in development control decisions. It states that "*The planning system should contribute to and enhance the national and local environment by … preventing both new and existing development from contributing to or being put to an unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or and instability...*"

The London Plan

The London Plan 2013 sets out the spatial development strategy for London. It brings together all relevant strategies, including the MAQS.

Policy 7.14, 'Improving Air Quality', addresses the spatial implications of the MAQS and how development and land use can help achieve its objectives. It recognises that Boroughs should have policies in place to reduce pollutant concentrations, having regard to the Mayor's Air Quality Strategy.

A Supplementary Planning Guidance (SPG) 'The Control of Dust and Emissions During Construction and Demolition' requires an assessment of the impacts of construction works on air quality, using the IAQM methodology. An Air Quality (Dust) Risk Assessment (AQDRA), is to be submitted with the planning application, together with confirmation that an Air Quality and Dust Management Plan (AQDMP) will be provided to the local authority prior to the commencement of works. In this report these documents are referred to as the Air Quality Assessment and the Dust Management Plan respectively.

A SPG on Sustainable Design and Construction sets out how development proposals can be 'air quality neutral', as required under Policy 7.14 of The London Plan and minimum requirements for emissions from boilers.

All major developments in London need to be assessed against emissions benchmarks for buildings and transport. Developments with emissions of NOx and PM_{10} below these benchmarks are considered to be 'air quality neutral'.

Camden Council Planning Policies

Camden Council have adopted a number of planning documents that in conjunction with the London Plan form the development plan for Camden, which is used as a key resource for planning decisions in the borough.

Among these documents are Development Policies setting out detailed planning criteria that are used in the determination process. The principle policies are set out below:

- DP32 – Air quality and Camden's Clear Zone – as part of this policy the council work to designate Central London as a Clear Zone region as a mechanism to reduce congestion and promote walking and cycling as a way of improving the borough's air quality. As part of this policy it states that an air tight building with mechanical ventilation and good insulation can make living adjacent to railways and busy roads acceptable with regards to noise, vibration and internal air quality. In line with this Camden will require any attenuation measures to be identified prior to planning permission being granted and secured for the lifetime of the development.

4.0 Scope and Methodology of Assessment

4.1 Scope

The following potential air quality impacts have been considered in this assessment:

- Construction impacts on dust and ambient PM_{10} concentrations
- The impact of poor air quality on the exposure of future users of the proposed development

As noted in the introduction the impact of traffic and boiler/CHP emissions have been screened out of the assessment for the following reasons;

- There will be less traffic with the proposed hotel than with its current use as a car park; and
- There will not be no boiler plant.

As the emissions from the proposed development will be less than those currently, the project will be air quality neutral and therefore the benchmarking assessment required by the London Plan's SPG on sustainable design and construction development is not relevant and has not been undertaken.

4.2 Construction Phase

Fugitive dust emissions during the construction may give rise to increased PM_{10} concentrations and dust deposition. These impacts have been assessed using the IAQM methodology, in accordance with the SPG on 'The Control of Dust and Emissions During Construction and Demolition' (2014).

Activities on the proposed construction site have been divided into two types to reflect their different potential impacts. These are:

- Construction; and
- Trackout.

No significant earthworks or demolition are anticipated as the redevelopment is principally a refurbishment of the existing space. Earthworks and demolition have therefore been screened out from further assessment.

The potential for dust emissions was assessed for each activity that is likely to occur and considered two separate dust effects:

- Annoyance due to dust soiling; and,
- The risk of health effects due to a significant increase in exposure to PM_{10}.

There are no designated ecological sites close to the proposed works and so are not included in the assessment.

4.3 Operational Phase

A review of current air quality in the vicinity of the proposed development was undertaken to identify whether the inlet air for the proposed hotel's ventilation system is likely to contain concentrations of NO_2 and/or PM_{10} above the air quality objective value (see Table 1).

This review comprised a desk-top study of the following data sources:

- Local monitoring data from the London Air Quality Monitoring Network;
- Camden Council's 2014 Air Quality Progress Report;
- The UK Pollutant Release and Transfer Register;
- Background pollution maps from Defra's Local Air Quality Management (LAQM) website;

- London Air Annual Pollution Maps produced by the Environmental Research Group; and
- Aerial photography from Google Maps.

There is no statutory guidance in the UK on how to describe air quality impacts, or how to assess their significance. The approach developed by the IAQM and incorporated into the 2010 EPUK guidance applies to changes in air quality, which is not applicable for this assessment. Instead professional judgement has been used to determine the need for mitigation measures to ensure that future users of the proposed hotel are not exposed to unacceptable ambient air quality.

4.4 Consultation

The air quality assessment methodology was discussed with Amy Farthing, of the Culture and Environment Department at Camden Council and confirmed by email from Chris Rush of Hoare Lea to Amy Farthing on the 10th February 2015 and an email from Amy Farthing to Chris Rush on the 11th February 2015.

5.0 Baseline Air Quality

This section sets out the available information on air quality near the proposed development.

Camden Council's Monitoring Data

Camden Council operates four automatic monitoring sites. The closest to the proposed development are:

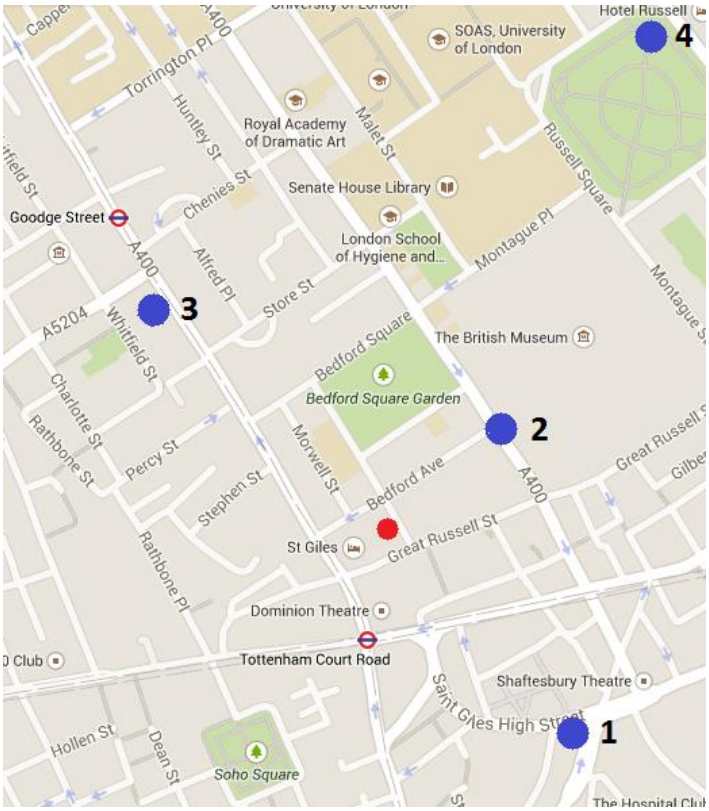
- Shaftesbury Avenue (x 530060, y181290). A roadside monitoring station measuring NO_2 concentrations
- London Bloomsbury (x 5230120, y182034). An urban background monitoring station measuring NO_2 and PM_{10} concentrations.

In addition there are 14 diffusion tube sites located throughout the Borough monitoring NO_2, with the closest to the proposed development at Tottenham Court Road (x 529568, y181728) and Bloomsbury Street (x 529962, y181620).

The Shaftesbury Avenue monitoring station is approximately 275 m south east of the proposed development, and London Bloomsbury approximately 570 m to the north east. The Tottenham Court Road diffusion tube is approximately 320 m to the north west from the proposed development, and the Bloomsbury Street diffusion tube is approximately 50 m to the north east.

The local authority air quality monitoring sites are shown in Figure 1, with concentrations for 2009 to 2013 summarised in Tables 2 and 3.

Figure 1 Monitoring Locations



Blue dot 1 – Shaftesbury Avenue (CD3), Blue dot 2 – Bloomsbury Street (CA21), Blue dot 3 – Tottenham Court Road (CA11), Blue dot 4 – London Bloomsbury (LB), Red dot - proposed development (Google copyright 2015)

Table 2 Summary of Nitrogen Dioxide Automatic and Non-automatic Monitoring (2009-2013)[a,b]

Site ID.	Site Type	Location	2009	2010	2011	2012	2013
Automatic Monitors – Annual Mean (µg/m^3)							
CD3	Roadside	Shaftesbury Avenue	**88**	**89**	**76**	**71**	**74**
LB	Urban background	London Bloomsbury	54	55	50	**55**	**44**
Objective				**40 µg/m^3**			
Automatic Monitors – No. of Hourly Means >200 µg/m^3							
CD3	Roadside	Shaftesbury Avenue	13	**21**	15	12	6
LB	Urban background	London Bloomsbury	2	**1**	0	1	0
Objective				**18 hours >200 µg/m^3 permitted per year**			
Diffusion tubes – Annual Mean (µg/m^3)							
CA11	Kerbside	Tottenham Court Road	**108**	**92**	**92**	**83**	**88**
CA21	Roadside	Bloomsbury Street	**81**	**41**	**77**	**72**	**76**
Objective				**40 µg/m^3**			

[a] – Exceedance of the objectives are shown in bold
[b] – Data obtained from Camden LAQM Progress Report (April 2014)

Annual mean NO_2 concentrations were above the objective between 2009 to 2013 at all the nearby monitoring locations. There have been no exceedances of the 1-hour mean NO_2 since 2010, even though concentrations above 60 µg/m^3 have been measured.

Table 3 Summary of PM_{10} Automatic Monitoring (2009 – 2013)[a,b]

Site ID.	Site Type	Location	2009	2010	2011	2012	2013
PM_{10} Annual Mean (µg/m^3)							
CD3	Roadside	Shaftesbury Avenue	30	29	32	29	29
LB	Urban background	London Bloomsbury	23	18	22	19	18
Objective				**40**			
PM_{10} No. of Days >50 µg/m^3							
CD3	Roadside	Shaftesbury Avenue	30	29	27	18	17
LB	Urban background	London Bloomsbury	15	2	17	10	4
Objective				**35 days >50 µg/m^3 permitted per year**			

[a] – Exceedance of the objectives are shown in bold
[b] – Data obtained from Camden LAQM Progress Report (April 2014)

Concentrations of PM_{10} were below the objectives at the nearby monitoring locations.

Environment Agency

The UK Pollutant Release and Transfer Register did not identify any significant industrial or waste management sources that are likely to affect the proposed development in regards to air quality.

Defra's Local Background Data

Defra estimated background concentration of NO_2 for 2014 is 48 µg/m^3 for the 1 km by 1 km grid where the site is located. This is above the objective value of 40 µg/m^3. Defra estimated background concentration for 2014 for PM_{10} is 25.5 µg/m^3, which is below the objective value. The grid reference from which this data was obtained was x 529500 y181500.

Environmental Research Group, King's College London, Pollution Maps

The annual pollution maps on the London Air website, produced by the Environmental Research Group (ERG) were reviewed. Maps are provided which show the annual mean concentrations of NO_2 and PM_{10} during 2010 across London. Figures 2 and 3 illustrate the annual mean NO_2 and PM_{10} concentration bands in the immediate area of the proposed development.

Figure 2 **Modelled annual mean NO_2 air pollution, based on measurements made during 2010 (Environmental Research Group 2015)**

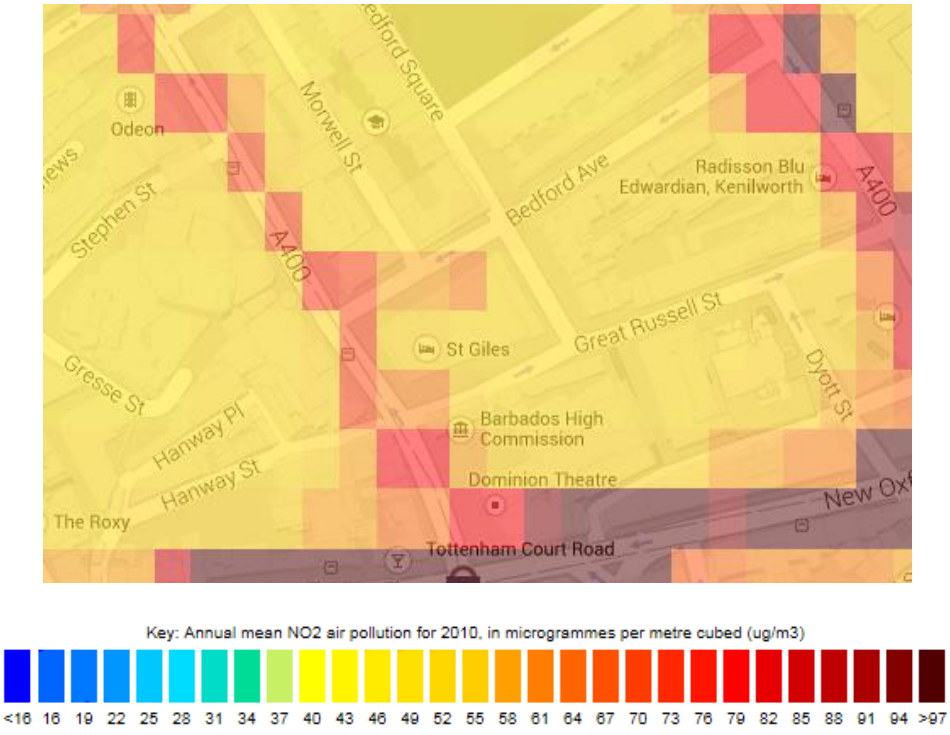


Figure 2 shows that annual mean NO_2 concentrations in Adeline Place are in the range 46 to 55 µg/m^3, which is above the objective value of 40 µg/m^3.

Figure 3 **Modelled annual mean PM_{10} air pollution, based on measurements made during 2010 (Environmental Research Group, 2015)**

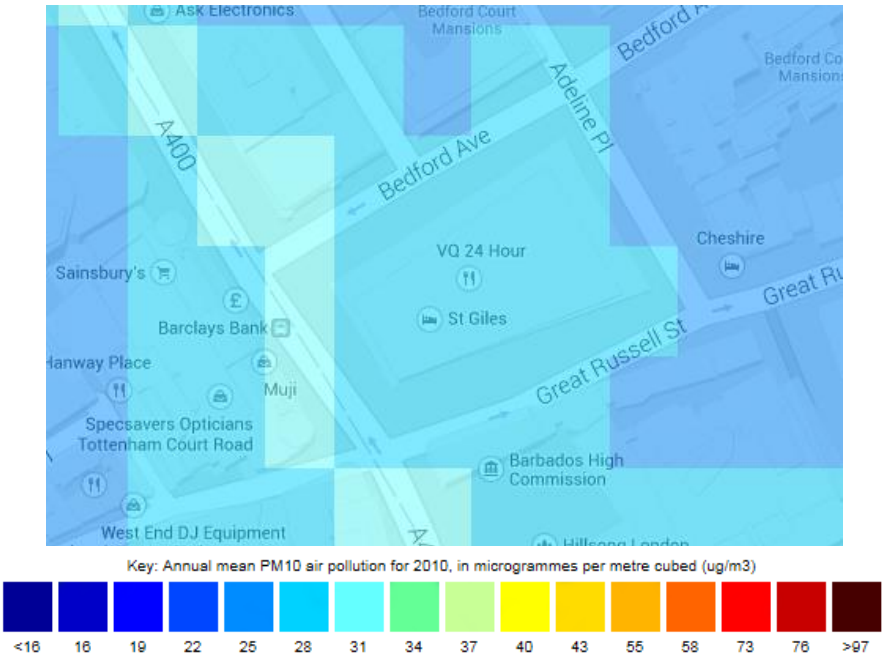


Figure 3 shows that concentrations of PM_{10} in Adeline Place were between predicted to be 25 to 28 µg/m^3, which is significantly below the objective value. Data is not provided regarding the number of days when the short term objective value (50 µg/m^3) is exceeded. Local Air Quality Management Guidance from Defra suggests that the 24-hour objective is unlikely to be exceeded where the annual mean is below 32 µg/m^3, and therefore it is considered the short term PM_{10} objective will be achieved.

6.0 Impact Assessment

The potential for air quality impacts during the construction and operation phases are discussed in this section.

6.1 Construction Phase

This sub section provides the assessment of the construction and trackout impacts. Following this are summary sections summarising the dust emission magnitudes, sensitivity of the area and overall risk of dust effects.

Construction

The total building volume is likely to be less than 25,000m^3. In accordance with the IAQM criteria, the magnitude of potential dust emissions from construction is **small** as there is low potential for dust release from the construction material) likely to be used. This is due to most of the work being underground.

Trackout

Information on the number of HDV trips to be generated during the construction phase of the development was not available at the time of assessment. However, as there will be no unmade roads on the site it is considered unlikely that there will be significant track-out of mud from the site. In accordance with the IAQM criteria the magnitude of potential dust emissions from trackout is **small**.

Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of the anticipated works and is classified as either Small, Medium or Large.

Table 5 below summarises the dust emission magnitude for the proposed development.

Table 5 Dust Emission Magnitude

Activity	Dust Emission Magnitude
Construction	Small
Trackout	Small

Sensitivity of the Area

In assessing sensitivity the number of receptors within specific distance band from the proposed works have been identified.

The existing St Giles hotel located above the proposed development will continue to operate during the works and it has been assumed that the St Giles Hotel is equivalent to 10-100 residential receptors within 20m of the works. Therefore, for the construction works, the surrounding area is considered to be of **high** sensitivity with respect to dust soiling. Receptor sensitivity in terms of human health impacts is considered to be medium as hotel guests are unlikely to be exposed to PM_{10} concentrations over 50 µg/m^3 for more than 35 days per year. The sensitivity of the surrounding area is considered to be of **medium** sensitivity with respect to human health impacts

For trackout there are likely to be more than 100 receptors, including those within the existing St Giles Hotel that may be adversely affected. Therefore the surrounding area for trackout is considered to be **high** with respect to dust soiling and **medium** with respect to PM_{10} impacts on human health.

The sensitivity of the area is summarised for each activity in Table 6.

Table 6 Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area	
	Construction	Trackout
Dust Soiling	High	High
Human Health	Medium	Medium

Risk of Dust Effects

A summary of the unmitigated risk during each potential dust generating activity and potential effect is provided in Table 7.

Table 7 Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk	
	Construction	Trackout
Dust Soiling	Low Risk	Low Risk
Human Health	Low Risk	Negligible

As indicated in Table 7, the potential unmitigated risk of dust soiling and human health effects is **low** for construction and trackout in respect to dust soiling and **negligible** in terms of human health impacts.

It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario in terms or works being undertaken at the site boundary closest to each receptor area. Therefore, the actual risk is likely to be lower than that predicted during most of the construction phase given that the majority of the works will be underground.

6.2 Operational Phase

The relevant air quality criteria are provided in Table 1. It should be noted that the annual mean objectives do not apply for hotel developments, unless people live there as their permanent residence. It is not anticipated that either staff or guests will live at this hotel as their permanent residence; therefore the annual mean objectives do not apply. The short term objectives do apply for this type of development.

The likely annual mean concentrations of NO_2 in the vicinity of the hotel's proposed air intake along Adeline Place are likely to be lower than those measured at the roadside in Shaftesbury Avenue (71-89 $\mu g/m^3$) , as the traffic flows on Adeline Place are lower. Conversely, concentrations are likely to be higher than those at the background site in Bloomsbury Square (44-55 $\mu g/m^3$). The 2010 ERG modelling estimated concentrations in the range of 49 to 55 $\mu g/m^3$. However it is likely that this modelling under-estimated concentrations due to the use of the optimistic emission factors in use when the modelling was undertaken. This combined with Defra's current estimated background concentration of 48 $\mu g/m^3$ for 2014 suggests that concentrations could be higher, possibly as high as 60-70 $\mu g/m^3$. Although the annual mean objective does not strictly apply at hotels, that fact that it could be above 60 $\mu g/m^3$ suggests that there is a potential for the one-hour objective to be exceeded at the Adeline Place façade.

Both the annual and 24-hour PM_{10} objectives are likely to be achieved. The highest concentration measured in the last five years at London Bloomsbury monitoring station was 23 $\mu g/m^3$ and even with a contribution from the traffic on Adeline Place it is considered unlikely that the total PM_{10} concentration will exceed 31 $\mu g/m^3$. It is therefore concluded unlikely that the PM_{10} concentrations in the hotel's ventilation

system will exceed either objective and therefore future users of the proposed development will not be exposed to unacceptable concentrations of PM_{10} in the ventilation air.

7.0 Mitigation

7.1 Construction Phase

To mitigate the potential impacts due to the refurbishment works it is suggested that mitigation measures consistent with the GLA's SPD and IAQM's guidance for low risk sites are implemented. Table 8 provides an indicative list of appropriate measures, but is not exhaustive.

To comply with the SPD an Air Quality and Dust Management Plan (AQDMP) should to be agreed with Camden Council prior to work commencing. This should be incorporated into a Construction Environmental Management Plan (CEMP). It is recommended that the planning consent includes a planning condition requiring an AQDMP to be approved by the local planning authority prior to work commencing.

Table 8 Fugitive Dust Mitigation Measures

Issue	Control Measure
Communications	• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary • Display the head or regional office contact information • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the LA
Site Management	• Record all dust and air quality complaints • Mark a complaints log available to the local authority upon request. • Record any exceptional incidents that cause dust/or air emissions, and the action taken to resolve the situation
Monitoring	• Undertake daily on-site and off-site inspection to monitor dust. This should include regular dust soiling checks of surfaces within 100m of site boundary. • Cleaning to be provided if necessary • Carry out regular site inspections to monitor compliance with the DMP • Increase frequency of site inspections when activities with a high potential to produce dust are being carried out
Preparing and Maintaining the Site	• Plan 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. • Fully enclose site or specific operations where there is a high potential for dust production and the site as activities for an extensive period • Avoid site runoff of water or mud • Keep site fencing, barriers and scaffolding clean using wet methods • Use water as dust suppressant where applicable • Remove materials that have a potential to produce dust from site as soon as possible • Cover, seed or fence stockpiles to prevent wind whipping
Operating Vehicles / Machinery and Sustainable Travel	• All vehicles to switch off engines - no idling vehicles • Avoid the use of diesel or petrol powered generators where practicable • Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London non-road mobile machinery (NRMM) standards

Issue	Control Measure
Operations	• Cutting, grinding or sawing equipment to use water as dust suppressant or suitable local extract ventilation • Ensure an adequate water supply on the site for effective dust / particulate matter suppression / mitigation, using non- portable water where possible and appropriate • Use enclosed chutes and covered skips • Minimise drop heights • Ensure equipment is readily available on site to clean any spillages
Waste Management	• No bonfires or burning of waste materials
Construction	• Avoid scabbling (roughening of concrete surfaces) • Ensure sand and other aggregates are stored appropriately and not able to dry out
Trackout	• Use water-assisted dust sweeper on the access and local roads • Avoid dry sweeping of large areas • Ensure vehicles entering and leaving sites are covered to prevent escape of materials

7.2 Operational Phase

Measures to reduce pollutant emissions from road traffic are principally being delivered in the longer term by the introduction of more stringent emissions requirements, including the use of real world emission standards via European legislation and improvements being brought forward by Camden Councils initiatives contained in Camden's Clean Air Action Plan 2013 - 2015.

In the interim, while high ambient concentrations of NO_2 remain, it is proposed that the air intake is fitted with a NO_2 scrubber. Annex 2 shows the proposed location of the air intake.

This filtration system proposed will incorporate a dry 'gas scrubbing' media, such as Nitrosorb™ as supplied by AAC Ltd, on the outside air supply connection to the hotel MVHR system. The dry gas scrubber unit will be provided with a G4 pleated panel dust filter upstream of the gas scrubber media to protect the media from degradation. A further G4 pleated panel filter will also be provided on the downstream side of the gas scrubber media to protect against carryover of the media into the hotel.

Information provided by AAC Ltd suggests that their Nitrosorb™ system removes 76% of NO_2 at an inlet concentration of approximately 50 µg/m^3, and 81% at 95 µg/m^3. If the ambient concentration is 70 µg/m^3, i.e. towards the likely upper range, and its efficiency is 70%, i.e. lower than stated by the supplier, the NO_2 concentration in the air after the scrubber would be 21 µg/m^3. This would provide a good level of protection to the future residents, even if there is some reduction in efficiency over time.

Annex 3 provides further details relating to the filtration system, including maintenance requirements. Annex 4 provides detail in relation to the Nitrosorb™ product.

It is recommended that the planning consent contains a planning condition relating to the provision and maintenance of an appropriate air scrubbing system. The latter could be in the form of a Hotel Management Plan.

8.0 Residual Impacts

7.1 Construction Phase

Assuming the relevant mitigation measures outlined in Table 8 are implemented, the residual effect from dust generating activities associated with this phase of the development is considered to be **not significant.**

7.2 Operational Phase

The residual effect associated with exposure of users of the building to poor air quality is also considered to be **not significant**.

9.0 Summary and Conclusions

The proposal is for the refurbishment of an existing underground car park at two levels -4 and -5 to a budget hotel. The proposed development is located in the London Borough of Camden, which has been declared an AQMA for both short term and long term objectives of NO_2 and PM_{10}. The hotel will require a mechanical ventilation system with the air intake from ground level, as there will be no access to the roof of the building

It was agreed with Camden Council that due to the nature and scale of the proposed development that an assessment of the air quality impacts of traffic from the proposed development was not required. Also no new boiler plant or CHP is proposed, and therefore this was not considered further as part of the assessment.

During the proposed development's construction there is considered to be a low risk of dust and PM_{10} impacts given the nature of the proposed works. It is recommended that mitigation measures commensurate with this level of risk are implemented and that there be a planning condition requiring an AQDMP approved by the local planning authority prior to commencement of these works.

The location of the air intake for the ventilation system is proposed to be from the Adeline Place façade at the ground level. Air quality on this façade is likely to be better than on other facades along busier roads, however, the annual mean, and potentially the 1-hour mean NO_2 objectives are not met at this location, although both PM_{10} objectives are achieved. The annual mean objective does not apply at hotel facades, but given the risk that the one hour NO_2 objective may be exceeded it is recommended that filtration NO_2 scrubber is fitted to the air intake.

It is also recommended that there is a planning condition relating to the provision and maintenance of an appropriate air scrubbing system. The latter could be in the form of a Hotel Management Plan.

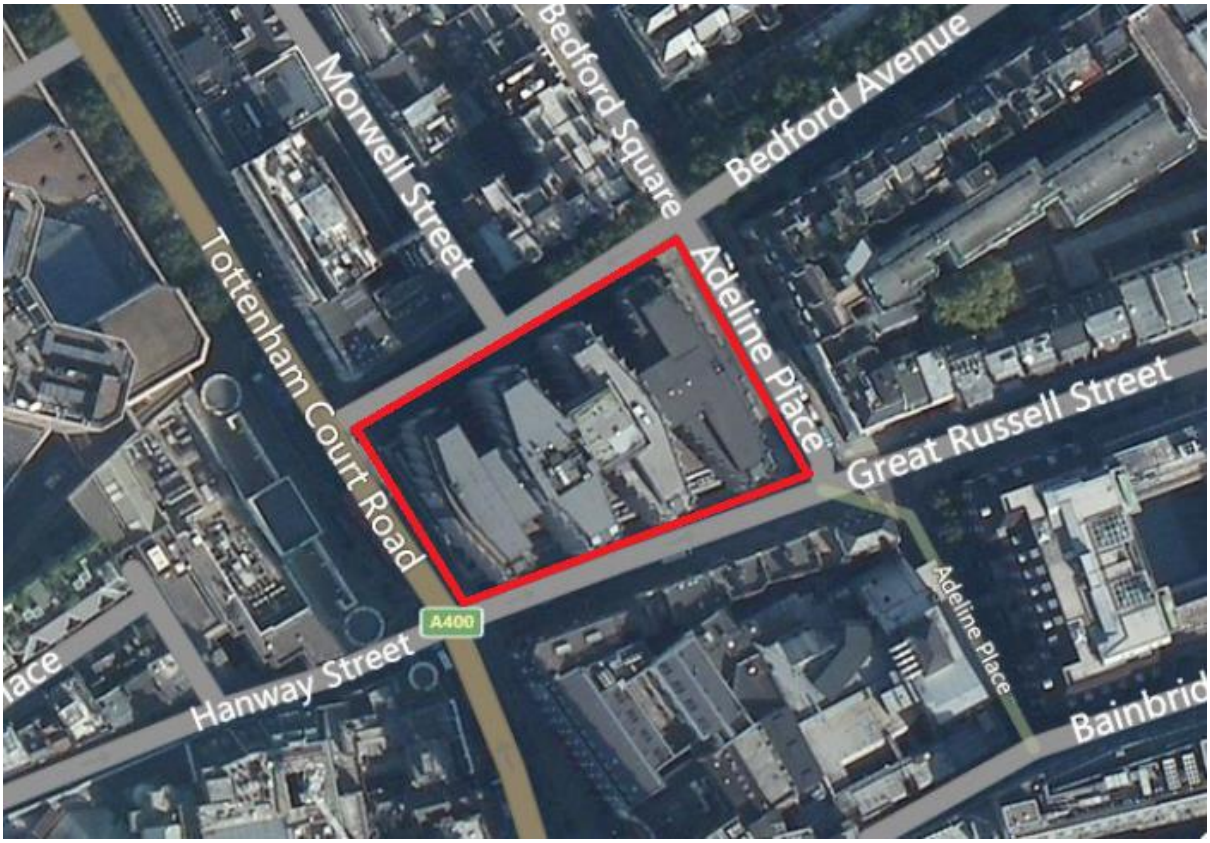
10.0 Glossary of terms

AQMA	Air Quality Management Area
AURN	Automatic Urban and Rural Network
CHP	Combined Heat and Power
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LB	London Borough
LDF	Local Development Framework
µg/m^3	Micrograms per cubic metre
MAQS	Mayor's Air Quality Strategy
NAEI	National Atmospheric Emissions Inventory
NO	Nitric oxide
NO_2	Nitrogen dioxide
NO_x	Nitrogen oxides (taken to be NO_2 + NO)
NPPF	National Planning Policy Framework
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}	Particulate matter with an aerodynamic diameter less than 10 micrometres
$PM_{2.5}$	Particulate matter with an aerodynamic diameter less than 2.5 micrometres
PPG	Planning Practice Guidance
SPG	Supplementary Planning Guidance
SPD	Supplementary Planning Document
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal

11.0 Annexes

Annex 1 Location Plan

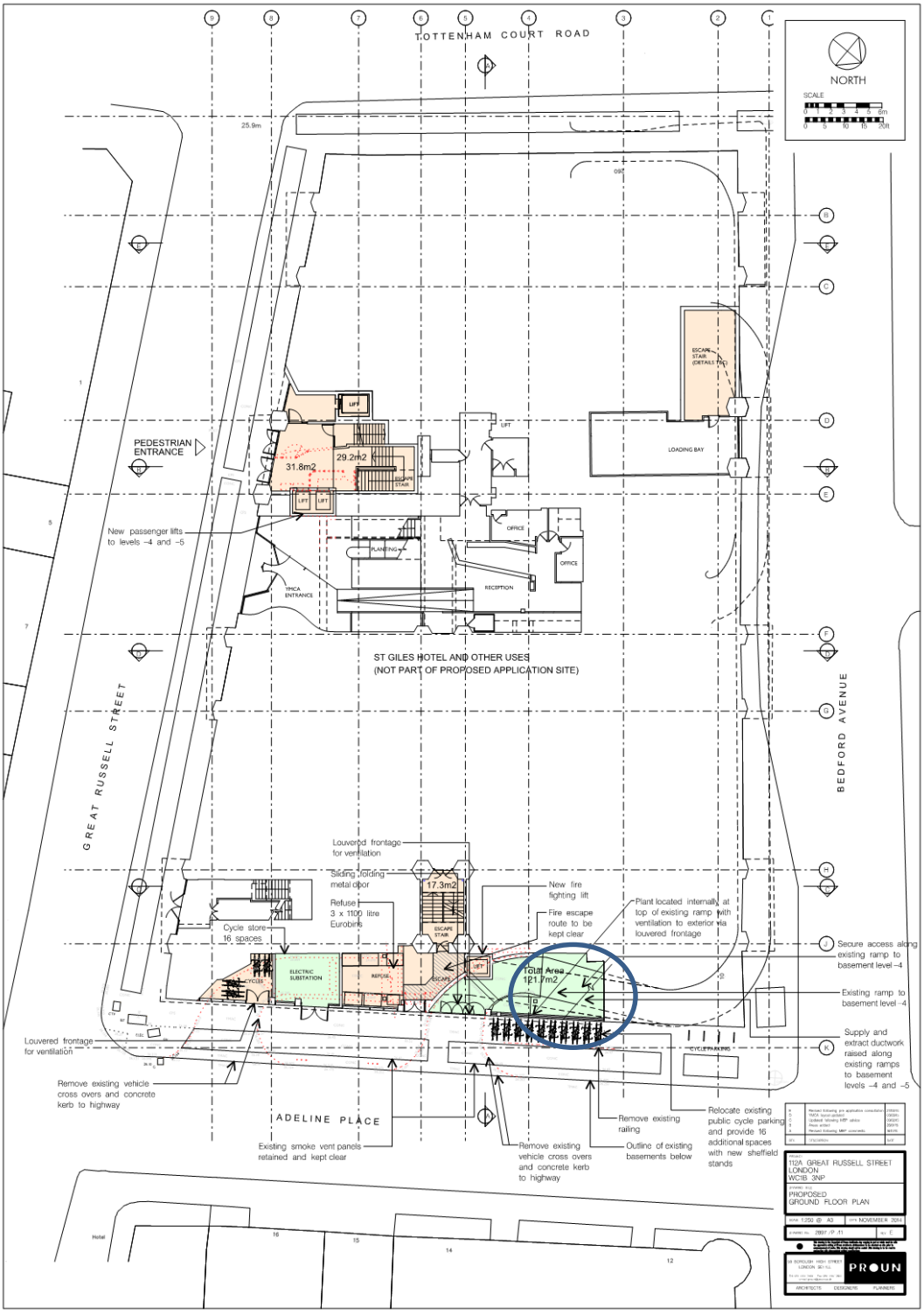
Figure A1.1 Aerial view of existing St Giles Hotel with proposed development boundary



Red line - proposed development boundary

Annex 2 Proposed Development

Figure A2.1 Plan of hotel layout with proposed air intake on Adeline Place (highlighted by blue circle)



Annex 3 Filtration System Detail

The below information should be reviewed in line with the final proposed mitigation system for installation, to ensure detail within any maintenance schedule / hotel management plan is fully in line with the precise manufacturers specifications to maintain effectiveness and meet required standards. The below detail is based on the AAC Ltd Nitrosorb™ product.

Efficacy

The efficiency of the system is reported by the supplier to be:

- 76.1% at an intake NO_2 concentration of approximately 50 µg/m^3
- 80.8% at 95 µg/m^3
- 83.2% at 150 µg/m^3

Dry Gas Scrubbing Media Replacement

A feature of the AAC Nitrosorb™ media proposed is that it has a media 'condition indicator which changes from initially white to light brown to dark brown when the media is fully exhausted. Examination of the media condition can be done by opening the housing and viewing the colour of the media. By colour comparison can be carried out with a swatch card supplied to assist in the servicing frequency.

Dust Filter Replacement

The condition of the dust filters can be assessed by measuring the pressure drop across them by means of a differential pressure gauge. When the pressure drop reaches a defined maximum value the filters shall require replacement.

Health and Safety

The AAC Nitrosorb™ media is non-hazardous to health and is non-combustible.

Annex 4 AAC Nitrosorb™ Product Sheet

LEADERS IN AIR & GAS PHASE FILTRATION TECHNOLOGY

AAC Swiftpack® with Nitrosorb® media for - *NO_2 and NOx Removal*

Can you be compliant with the EU CAFÉ DIRECTIVE?

Introduction

Environmental Pollution arising from contaminants such as Nitrogen Dioxide (NO_2) are an increasing issue to the air quality of densely populated city environments.

Problems relating to atmospheric pollution and air quality are major considerations to those involved in major construction programmes in built up areas. Consulting Engineers and Environmental Consultants are under increasing pressure from local authority planning departments to comply and conform with the EU Directive 2008/50/EC (the CAFÉ Directive). European Union Air Quality and Clean Air for Europe 2008 and to implement mitigation measures that are designed to improve the indoor air quality of their new build projects.

NITROSORB™ is an AAC Eurovent dry chemical scrubbing media product, specifically selected for its ability to efficiently remove low concentrations of Nitrogen Dioxide and NOx at levels typically found in atmospheric pollution.

The **AAC Swiftpack®** with Nitrosorb® media provides the ideal solution as a mitigation measure accepted by Local Authority Planners in meeting stringent NO_2levels in designated Air Quality management Areas (AQMA).

The **AAC Swiftpack®** is an effective means of reducing high NO_2 levels down to the accepted level of 40ug/m3 as a mean annual concentration level. This system has been independently performance tested with extremely good results offering low pressure drops enabling them to be used effectively with Mechanical Ventilation Heat Recovery Units (MVHR'S).

In addition the units are installed with the Patented and unique AAC COLOURCELL® MEDIA FILTER SYSTEM

The **AAC Colourcell®** media filter system provides a visual indication of the condition of media installed. It enables operatives and end users to easily determine when the media needs to be replaced simply by the colour change.

Features

- Unique **NITROSORB®** media with **AAC Colourcell®** visual condition indication
- Low pressure drop
- Long lifespan of media typically 2-5 years
- Low cost
- Optional PM10 filter can be installed into the unit

Benefits

- Accepted by planners as an acceptable AQMA NO_2 mitigation measure
- Compact size designed to enable installation into small spaces with bespoke designs.
- Independently tested
- Compatible with mechanical ventilation Heat Recovery (MVHR) Units
- Low running cost

The AAC **NITROSORB®** Filter cells can also be installed into Centralised Air Heating Plant by means of the **AAC Swiftkit®** & the AAC skeleton frame products.

Major Developers and House Builders are specifying the **AAC Swiftpack®**/Nitrosorb® media filter system as their preferred NO_2 Mitigation solution.

Address: AAC Eurovent Ltd, AAC House, Unit K Maybrook Industrial Estate,
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Email: sales@aaceurovent.co.uk **Website:** www.aaceurovent.co.uk

Annex 5 Professional Experience

Dr Claire Holman (Brook Cottage Consultants Ltd), BSc (Hons), PhD, CSci, CEnv, FCIWEM, FIEnvSc, FIAQM

Claire is a Director and owner of Brook Cottage Consultants Ltd., which provides air quality expertise to a range of industrial and public sector clients. She provides an advisory role with review and input at key stages of projects.

Claire has worked on air quality management for over 30 years. She has experience of developing emission inventories, emission control, ambient monitoring, dispersion, cost benefit and cost-effectiveness analysis and policy development. She has undertaken numerous air quality assessments for new developments. She also advised governments in Europe, Asia and Africa, as well as the European Commission and the Japan Clean Air Program on strategic air quality and climate change issues for the development of policy and new regulations.

Chris Rush (Hoare Lea), BSc (Hons), MSc, PG Dip Acoustics, CEnv, MIOA, MIEMA, MIEnvSc

Chris is a Senior Engineer with Hoare Lea and is part of the environmental group, which has a focus on infrastructure and supporting environmental impact assessments. He is a Chartered Environmentalist, a Member of the Institute of Acoustics, a Full Member of the Institute of Environmental Management and Assessment, a Member of the Institution of Environmental Sciences and an Associate Member of the Institute of Air Quality Management.

He has a diverse portfolio of experience and has worked on a range of projects from initial site feasibility, through planning and development to construction and operation. Chris' expertise covers planning, noise and air quality, specifically in relation to industrial fixed installations such as waste management centres and transportation environmental impact on developments including air traffic. His work regularly involves liaising with planning officers, environmental health officers, planning consultants, other specialist engineering consultants and members of the local community.