Air Quality Assessment

British Museum – SWEC Building

Great Russell Street, London, WC1B 3DG

August 2023

Revision C – 13 October 2023

ENVIRONMENTAL AND
SUSTAINABILITY CONSULTANTS

encon associates

Report Reference Number: A6016

Document Control

Date of first Issue	Revision	Date of Revision	Issued By	Checked by
31 August 2023	-	-	JK	MB
	A	29 September 2023	JK	MB
	B	13 October 2023	JK	MB
	C	20 October 2023	JK	MB

Executive Summary

Encon Associates were commissioned by The British Museum (the 'Client') to carry out an air quality assessment in connection with the proposed redevelopment of a building within the British Museum Site, Great Russell Street, London (the 'Site').

The Site falls within the administrative boundary of London Borough of Camden (LBC). Due to exceedances of the national air quality annual mean objective for nitrogen dioxide, (NO_2) and short-term PM_{10} objective, the Council has declared the whole borough an air quality management area (AQMA). Based on the current design layout and criteria set out within the Camden Air Quality Planning Guidance[1], the development is classed as a 'major' scheme as the floorspace being created, which includes the proposed development and extension, is approximately 2,200 m^2 (i.e. more than 1000 m^2). The proposed development is in an area of poor air quality as the estimated NO_2 background concentrations based on the Defra background maps exceed 40 µg/m^3 (section 5.2), however the scheme will not introduce sensitive receptors as it is being primarily used for housing plant with additional offices/meeting rooms or bring air quality impacts as it is a car free development. Although, the Camden Air Quality Planning Guidance requires a detailed assessment to be carried out, there will be no operational vehicle movements associated with the development. The requirement for a detailed assessment has therefore been scoped out as the impacts on local air quality as a result of operational traffic emissions is considered to be negligible and has not been assessed further. A 'basic' Air Quality Assessment has therefore been carried out, including a Construction Impact Assessment and the proposals have also been assessed against the London Plan Air Quality Neutral Policy[2] in accordance with the Greater London Authority (GLA) AQN guidance[3] .

[1] LBC (2021) Camden Planning Guidance Air Quality, January 2021
[2] Greater London Authority (March 2015) The London Plan: The Spatial Development Strategy for London Consolidated with Alterations Since 2011
[3] Greater London Authority (2023) London Plan Guidance, Air Quality Neutral, February 2023

It is inevitable that with any development, demolition and construction activities will cause some disturbance to those nearby. Dust arising from most construction activities tends to be of a coarse nature, which through dispersion by the wind can lead to soiling of property including windows, cars, external paintwork and laundry. However, as well as giving rise to annoyance due to soiling of surfaces from dust emissions, there is evidence of major construction activities causing increases in long term PM_{10} concentrations and in the number of days exceeding the short term PM_{10} objective of 50 μgm^{-3}.

The IAQM guidance on assessing impacts on air quality from construction activities and determining the likely significance has been used to determine the risk of impacts occurring during the construction of the development and to identify appropriate mitigation measures to be implemented on site to reduce dust emissions and associated impacts.

Due to the proximity of nearby receptors, the Site is considered to have a low risk with regards to dust soiling during demolition, construction and trackout at the SWEC site but a medium risk at the ISS site. The site is considered to have a negligible risk with regard to PM_{10} concentrations during all aspects of the construction phase. However, following the implementation of appropriate mitigation measures impacts associated with the construction of the development are likely to be insignificant.

The baseline assessment has concluded that pollution levels at the Site are currently meeting the relevant air quality objective limits for NO_2, PM_{10} and $PM_{2.5}$ in respect of short term exposure for work place environments. Impacts in terms of exposure will therefore be negligible.

A review of the proposed life-saving diesel generators shows that the risk of significant effects on local air quality will be low due to the emissions flue terminating over 7 m above the nearest building and having a separation distance of over 20 m from the nearest building. Dispersion of emissions will not therefore be hampered by significant downwash and dispersion of emissions will be good.

The development has been assessed against Policy S1 of the London Plan and has been found to be air quality neutral in respect of both building and transport emissions.

The proposed development would meet current national and local planning policy and based on the results of this assessment air quality does not pose a constraint to development of the Site for the proposed use.

Table of Contents

1 Introduction

1.1 General

Encon Associates were commissioned by The British Museum (the 'Client') to carry out an air quality assessment in connection with the proposed redevelopment of the South West Boiler House building located to the rear of 36 -42 Bloomsbury Street, to the southwest of the British Museum Site, London ('the Site'). The proposals are for the demolition of existing Energy Centre to internal West Road and removal of temporary buildings to the south of the existing energy centre on the internal West Road and to the north and east of the White Wing facing Montague Street and erection of new energy centre incorporating maintenance support accommodation to internal West Road, new substation off Montague Street, all together with associated internal and external works, service runs, erection of plant, landscaping, and temporary works associated with construction. The proposals also include an Incoming Substation (ISS) building off the East Road, fronting onto Montague Street.

The Site falls within the administrative boundary of London Borough of Camden (LBC). Due to exceedances of the national air quality annual mean objective for nitrogen dioxide, (NO_2) and short-term PM_{10} objective, the Council has declared the whole borough an air quality management area (AQMA). Based on the current design layout and criteria set out within the Camden Air Quality Planning Guidance, the development is classed as a 'major' scheme as the floorspace being created, which includes the proposed development and extension, is approximately 2,200 m^2 (i.e. more than 1000 m^2). The proposed development is in an area of poor air quality as the estimated NO_2 background concentrations based on the Defra background maps exceed 40 µg/m^3 (section 5.2), however the scheme will not introduce sensitive receptors as it is being primarily used for housing plant with additional offices/meeting rooms or bring air quality impacts as it is a car free development. Although, the Camden Air Quality Planning Guidance requires a detailed assessment to be carried out, there will be no operational vehicle movements associated with the development.

The requirement for a detailed assessment has therefore been scoped out as the impacts on local air quality as a result of operational traffic emissions is considered to be negligible and has not been assessed further. A 'basic' Air Quality Assessment has therefore been carried out, including a Construction Impact Assessment and the proposals have also been assessed against the London Plan Air Quality Neutral Policy[4] in accordance with the Greater London Authority (GLA) AQN guidance. The scope of works has been determined based on professional judgement and in accordance with the Camden Air Quality Planning Guidance.

This report assesses air quality impacts associated with the proposed development.

A glossary of common air quality terminology is provided in Appendix A.

1.2 Scope of Assessment

The proposed development will include:

- Demolition of existing Energy Centre to internal West Road.
- Removal of temporary buildings to the south of the existing energy centre on the internal West Road and to the north and east of the White Wing facing Montague Street.
- Erection of new energy centre incorporating maintenance support accommodation to internal West Road, new substation off Montague Street, all together with associated internal and external works, service runs, erection of plant, landscaping, and temporary works associated with construction.

The proposals would not provide any on-site parking and is therefore classed as a car free development.

A baseline assessment of local air quality has been carried out to determine pollution levels at the Site and assess the sites suitability for use as a plant room and employment use.

The assessment has concentrated on nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter of less than 10 µm and 2.5 µm (PM_{10} and $PM_{2.5}$), the pollutants most associated with traffic emissions and which can be harmful and cause discomfort to humans.

An assessment of air quality impacts associated with the construction of the proposed development has been undertaken following the methodology set out within the Institute of Air Quality Management (IAQM) guidance[5].

The proposals have also been assessed against the London Plan Air Quality Neutral Policy[6] in accordance with the Greater London Authority (GLA) AQN guidance[7].

[5] IAQM (January 2014) Guidance on the Assessment of Dust from Demolition and Construction. Version 1.1
[6] Greater London Authority (March 2015) The London Plan: The Spatial Development Strategy for London Consolidated with Alterations Since 2011
[7] Greater London Authority (2023) London Plan Guidance, Air Quality Neutral, February 2023

2 Site Description

2.1 The Existing Site

The Site is located within the British Museum site in Bloomsbury towards the southwestern boundary. The Site lies to the rear of 36-42 Bloomsbury Street and south of the Duveen Gallery. The surrounding area comprises a mix of offices, hotels and residential accommodation.

The nearest residential properties are located on Bloomsbury Street, to the west of the Site.

The Site extends to approximately 1.109 ha (1,090 m^2) in area and the location of the Site is presented in red in Figure 2.1.

A small area of land adjacent to Montague Street is also included within the proposals for the provision of a new ISS building. The land is to the north-east of the British Museum and is located adjacent to the White Wing, a listed building of high importance. The location is also shown in Figure 2.1.

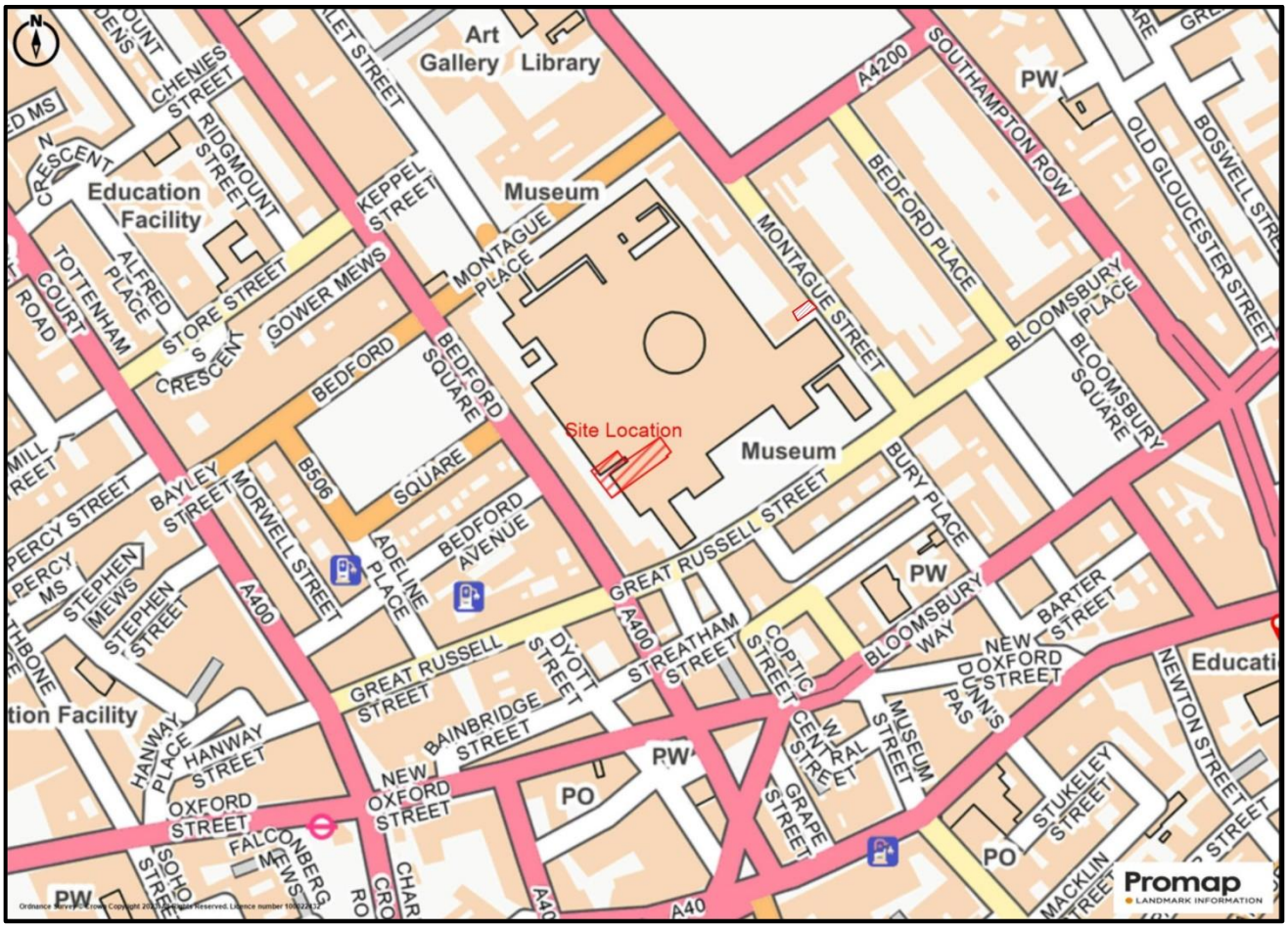


Figure 2.1: Location of proposed development site

2.2 Proposed Development

The proposed application is for the demolition of the existing South West Boiler House building immediately to the south of the Duveen Gallery, removal of several portacabins and erection of a new six-storey replacement SWEC building to be primarily used for housing the new energy centre with additional offices/meetings rooms. . The proposed GIA is approximately 2,200 m².

The layout of the floors is as follows:

Ground Floor – Generator room, Transformer rooms;

1st Floor – Switchrooms, Comms room and store

2nd Floor – WSHP plant;

3rd Floor – 1 Office, 3 meeting rooms, BMS room, Store, male and female changing rooms;

4th Floor – 1 Office, 4 meeting rooms, mess, store, male and female changing rooms; and

5th Floor – Air Source Heat Pumps

Most areas will be unheated apart from the offices, mess and meeting rooms which will have electrical heaters via Air Source Heat Pumps. Any hot water requirements will also be served by local electric heaters. There will be 2 no. standby/emergency generators on the ground floor, including the generator fuel tank which will only be used for short periods during periodic testing (testing regime of 30 minutes per generator, once a month).

An indicative layout of the third and fifth floors are shown in Figures 2.2 and 2.3 respectively.

The proposals also include for the demolition and removal of the existing portacabins on the ISS site, the re-landscaping of the loose gravel and tarmac area, repositioning of a lamppost and the construction of a new ISS substation.

Figure 2.2: Layout of Proposed Development – 3rd Floor

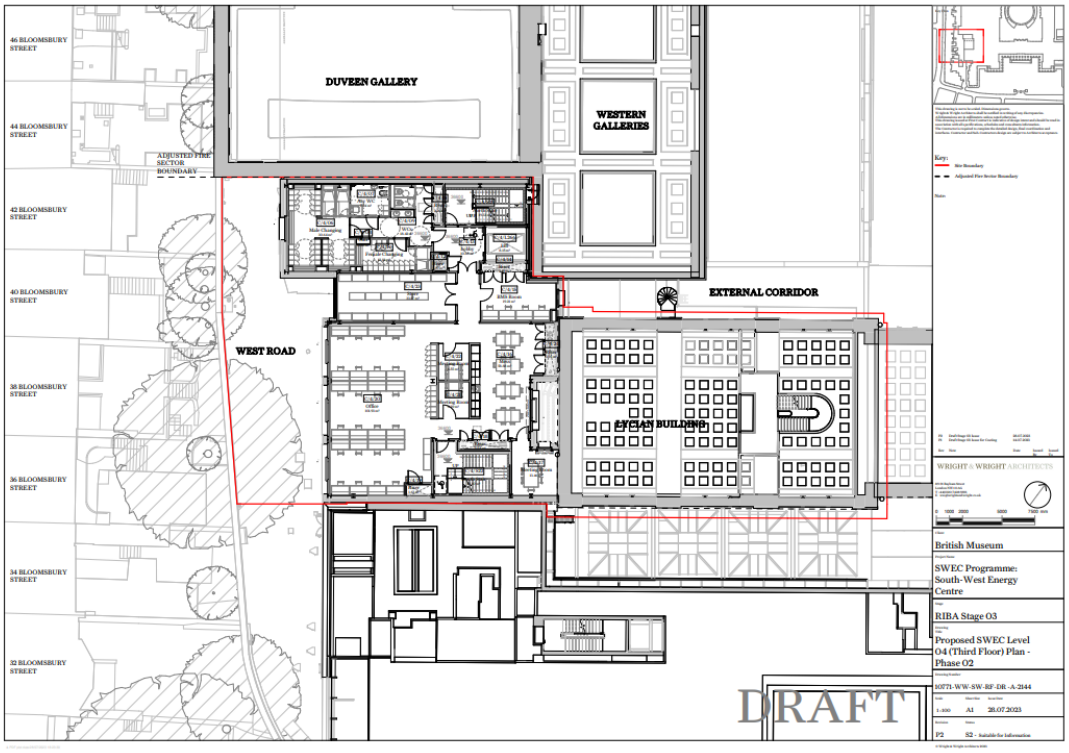
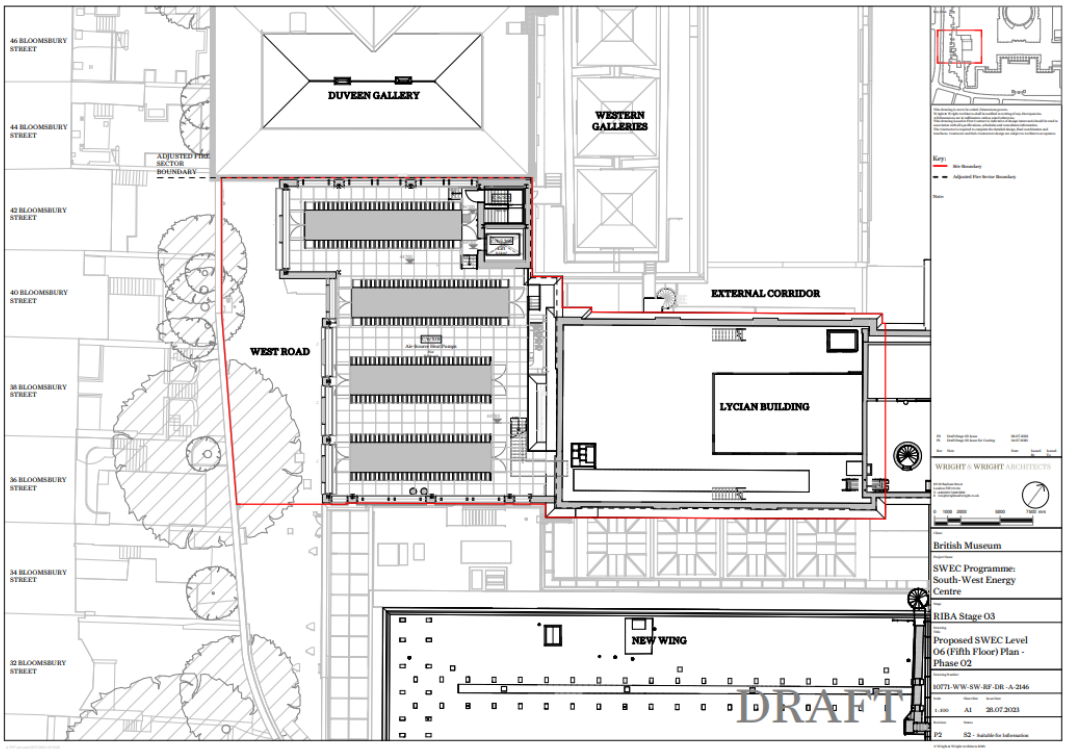


Figure 2.3: Layout of Proposed Development – 5th Floor



3 Policy Context

3.1 National Legislation and Policy

3.1.1 Air Quality Regulations

The Air Quality Standards Regulations 2010[8] and Air Quality EU Exit Regulations 2019[9] sets out a series of limit values for the protection of human health and critical levels for the protection of vegetation. The UK is currently exceeding the objective limits for NO_2 and PM_{10} within London and a number of other air quality zones within the UK.

3.1.2 The UK Air Quality Strategy

The Government's policy on air quality within the UK is set out in the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007[10], pursuant to the requirements of Part IV of the Environment Act 1995. The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in the UK. The AQS is designed to be an evolving process that is monitored and regularly reviewed.

The AQS sets standards and national air quality objectives (NAQO) for ten main air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3-butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), oxides of nitrogen (NO_x), particulate matter (PM_{10}, $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3) and polycyclic aromatic hydrocarbons (PAHs).

The air quality standards are long-term benchmarks for ambient pollutant concentrations which represent negligible or zero risk to health, based on medical and scientific evidence reviewed by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO). These are general concentration limits, above which sensitive members of the public (e.g. children, the elderly and the unwell) might experience adverse health effects.

[8] Air Quality Regulations 2010 – Statutory Instrument 2010 No. 1001
[9] Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 – Statutory Instrument 2019 No. 74
[10] The Air Quality Strategy for England, Scotland, Wales and Northern Ireland – July 2007

The air quality objectives are medium-term policy-based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

For some pollutants, there is both a long-term (annual mean) standard and a short-term standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants (e.g. temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road).

Of the pollutants included in the AQS, NO_2 and PM_{10} would be particularly relevant to this project as these are the primary pollutants associated with road traffic. The current statutory standards and objectives for NO_2 and PM_{10} in relation to human health are set out in Table 3.1.

The NAQO's for NO_2 and PM_{10} were to have been achieved by 2005 and 2004 respectively, but also continue to apply in all future years thereafter.

In relation to $PM_{2.5}$ the 2019 Clean Air Strategy[11] includes a commitment to set 'new, ambitious, long-term targets to reduce people's exposure to $PM_{2.5}$' which the proposed Environment Bill 2019-2021 commits the Secretary of State to setting. New legal targets are set out in the recently published Environmental Improvement Plan (EIP) 2023[12] , and recently published Statutory Instrument 'The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[13] . These have yet to be set in legislation. For the purposes of this assessment the limit value for $PM_{2.5}$ (as provided in Table 3.1) is considered to be appropriate to apply for this assessment. However, the new targets set out in the EIP are also provided in Table 3.1 and given consideration within the report.

[11] Defra. (2019). Clean Air Strategy. London: HMSO
[12] HM Government, Environmental improvement Plan 2023, First Revision of the 25 Year Environment Plan
[13] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 – Statutory Instrument 2023 No.96

Additionally, the Mayor of London has committed to meeting the World Health Organisation (WHO) guideline of 10 µg/m^3 by 2030.

The current DEFRA predicted baseline concentrations currently exceed the Mayor's commitment to achieve 10 µg/m^3 by 2030 and the EIP long-term target of 10 µg/m^3 for $PM_{2.5}$ across a significant proportion of London and the UK. However, the GLA has prepared a roadmap to compliance and have identified additional measures that are not within the DEFRA predictions (such as the Ultra-Low Emission Zone (ULEZ) expansion and tightening of Low Emission Zone (LEZ) requirements for HGVs). The impacts from this development are not considered to have the potential to compromise adherence to this roadmap. Furthermore, it is expected that the Government will introduce measures to reduce $PM_{2.5}$ concentrations throughout the UK to achieve the 2040 target for this pollutant.

Table 3.1: Relevant Objectives set out in the Air Quality Strategy

Pollutant	Concentrations	Measured As	Date to be Achieved by
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times per year	1-hour mean	31 December 2005
	40 µg/m^3	Annual mean	31 December 2005
Particulate Matter (PM_{10})	50 µg/m^3 not to be exceeded more than 35 times per year	24-hour mean	31 December 2004
	40 µg/m^3	Annual mean	31 December 2004
Particulate Matter ($PM_{2.5}$)	20 µg/m^3	Annual Mean	31 December 2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3 (Long-term Target)	Annual Mean	31 December 2040
	12 µg/m^3 (Interim Target)	Annual Mean	31 January 2028

The NAQOs apply to external air where there is relevant exposure to the public over the associated averaging periods within each objective. Guidance is provided within Local Air Quality Management Technical Guidance 2022 (LAQM.TG(22))[14] issued by the Defra for Local Authorities, on where the

[14] DEFRA (2022) Local Air Quality Management. Technical Guidance LAQM.TG(22)

NAQOs apply as detailed in Table 3.2. The objectives do not apply in workplace locations, to internal air or where people are unlikely to be regularly exposed (i.e. centre of roadways).

Table 3.2: Locations Where Air Quality Objectives Apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building Facades of residential properties, schools, hospitals, care home etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
24-hour mean	All locations where the annual mean objective would apply together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 hour mean objectives apply. Kerbside Sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend 1-hour or more. Any outdoor locations where the public might reasonably be expected to spend 1-hour or longer.	Kerbside sites where the public would not be expected to have regular access.

3.1.3 National Air Quality Plan for Nitrogen Dioxide (NO_2) in the UK

The National Air Quality Plan[15] was written as a joint venture between the Defra and the Department for Transport (DfT) and aims to tackle roadside concentrations of NO_2 in the UK. It includes a number of measures such as those aimed at investing in Ultra Low Emission Vehicles (ULEVs) charging infrastructure, public transport and grants to help local authorities in improving air quality. The plan requires all local authorities (LAs) in England with areas expected not to meet the Limit Values by 2020 (known as 'air quality hotspots') to develop plans to bring concentrations within these values in "the shortest time possible". These plans are to be reviewed by the government and suggestions included in the plan include actions such as utilising retrofitting technologies, changing

[15] Defra and DfT. (2017). UK plan for tackling roadside nitrogen dioxide concentrations. London: HMSO

road layout and encouraging public transport and ULEV use. Where these approaches are not considered sufficient, the LA may need to consider implementation of a Clean Air Zone (CAZ) which places restrictions on vehicle access to an area and may include charging certain (or all) vehicles or restrictions on the type of vehicle allowed to access an area.

3.1.4 Road to Zero Strategy

The 'Road to Zero' strategy[16] sets out the government's plans to encourage zero emissions vehicles. These include the aim that by 2040 all new cars and vans will have zero tailpipe emissions and by 2050 almost every car will have zero emissions. Measures within the Strategy are aimed at encouraging the uptake of the cleanest vehicles and supporting electric charging infrastructure.

3.1.5 Clean Air Strategy

The Clean Air Strategy sets out policies to lower national emissions of pollutants in order to reduce pollution and human exposure. It aims to create a strong framework to tackle air pollution and to reduce the number of people living in locations with $PM_{2.5}$ concentrations exceeding 10 µg/m^3 by 50% by 2025.

3.1.6 Control of Dust and Particulates Associated with Construction

Section 79 of the Environmental Protection Act (1990)[17] states that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Statutory nuisance is defined as:

- *'any dust or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance', and*
- *'any accumulation or deposit which is prejudicial to health or a nuisance'.*

Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.

[16] HM Government. (2018). Road to Zero Strategy. London: HMSO
[17] Secretary of State, The Environment Act 1990 HMSO

In the context of the proposed development, the main potential for nuisance of this nature would arise during the construction phase - potential sources being the clearance, earthworks, construction and landscaping processes.

There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist - 'nuisance' is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred. However, research has been undertaken by a number of parties to determine community responses to such impacts and correlate these to dust deposition rates. However, impacts remain subjective and statutory limits have yet to be derived.

3.2 Planning Policy

3.2.1 National Planning Policy

The National Planning Policy Framework (NPPF)[18] sets out the Government's planning policies for England and how these are expected to be applied. At the heart of the NPPF is a presumption in favour of sustainable development. It requires Local Plans to be consistent with the principles and policies set out in the NPPF with the objective of contributing to the achievement of sustainable development.

The NPPF states that the planning system has three overarching objectives in achieving sustainable development including a requirement to *'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.*'

Under Section 15: Conserving and Enhancing the Natural Environment, the NPPF (paragraph 174) requires that *'planning policies and decisions should contribute to and enhance the natural 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*

[18] Ministry of Housing, Communities and Local Government: National Planning Policy Framework (September 2023)

noise pollution or land instability. Development should, wherever possible help to improve local environmental conditions such as air and water quality.'

In dealing specifically with air quality the NPPF (paragraph 186) states 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. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.*'

Paragraph 188 states that *'the focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively'*.

3.3 Regional Legislation and Policy

3.3.1 The Mayor of London's Air Quality Strategy

The Mayor of London's AQS[19] sets out a series of policies and proposals for the implementation of the UK AQS and for the achievement of the air quality standards and objectives in Greater London.

With regards new developments the following policies are of relevance:

Policy '1 - Encouraging smarter choices and sustainable travel': *The Mayor will support a shift to public transport, by only supporting developments that generate high levels of trips in locations with good public transport accessibility, by supporting car free developments and encouraging the*

[19] Mayor of London (2010) Cleaning the Air, The Mayor's Air Quality Strategy, December 2010

inclusion of infrastructure to support sustainable travel, such as cycling, electric vehicle recharging points and car clubs;

Policy '6 - Reducing emissions from construction and demolition sites': *The London Council's Best Practice guidance will be reviewed and updated, and more vigorously implemented*;

Policy '7 - Using the planning process to improve air quality - *new developments in London as a minimum shall be 'air quality neutral': The Mayor will encourage boroughs to require emissions assessments to be carried out alongside conventional air quality assessments. Where air quality impacts are predicted to arise from developments these will have to be offset by developer contributions and mitigation measures secured through planning conditions, section 106 agreements or the Community Infrastructure Levy*;

Policy '8 - Maximising the air quality benefits of low to zero carbon energy supply': *The Mayor will apply emission limits for both PM and NOx for new biomass boilers and NOx emission limits for Combined Heat and Power Plant (CHPP). Air quality assessments will be required for all developments proposing biomass boilers or CHPPs and operators will be required to provide evidence yearly to demonstrate compliance with the emission limits*;

Policy '9 - Energy efficient buildings': *The Mayor will set CO_2 reduction targets for new developments which will be achieved using the Mayor's Energy Hierarchy. These measures will result in reductions of NOx emissions*; and

Policy '10 - Improved air quality in the public realm': *The Mayor will encourage the improvement of air quality in the public realm by planting vegetation to trap particulate matter. Through the planning system the Mayor will increase the number of green roofs and living walls across London. Additionally, he will encourage the planting of trees in areas of poor air quality*.

3.3.2 The London Plan

The London Plan 2021[20] was published in March 2021. The Plan is the overall Spatial Development Strategy (SDS) for London setting out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. It specifically addresses how development can help support the implementation of the Mayor's Air Quality Strategy and achieve a reduction in pollutant emissions and public exposure to pollution.

Policy SI 1 – Improving Air Quality sets out the following to reduce emissions and exposure across the city:

A Development Plans, through relevant strategic, site-specific and area-based polices, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor's or boroughs' activities to improve air quality.

B To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:

1) Development proposals should not:

a) lead to further deterioration of existing poor air quality

b) 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

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

2) In order to meet the requirements of Part 1, as a minimum:

a) development proposals must be at least Air Quality Neutral

b) 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

[20] Greater London Authority (2021) The London Plan 2021:The Spatial Development Strategy for Greater London, March 2021

c) 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

d) 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.

C Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:

1) how proposals have considered ways to maximise benefits to local air quality, and

2) what measures or design features will be put in place to reduce exposure to pollution, and how they achieve this.

D 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.

E 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.

3.3.3 London Environmental Strategy

The London Environmental Strategy[21] considers policies aimed at improving the environment in London, across a number of different areas such as air quality, noise and climate change. There are a number of objectives but notable in relation to air quality is the objective: "*for London to have the best air quality of any major world city by 2050, going beyond the legal requirements to protect human health and minimise inequalities*."

Chapter 4 of the Environmental Strategy relates specifically to air quality and identifies a number of key issues to be addressed:

- Achieving legal compliance as quickly as possible;
- Diesel vehicles, especially cars and vans;
- Tackling all sources of pollution;
- Government action;
- Maximising co-benefits between air quality and climate change policies; and

Further reductions are needed in PM_{10} and $PM_{2.5}$, particularly from transboundary pollution, tyre and brake wear and wood burning. Local Legislation and Policy.

3.4 Local Planning Policy

3.4.1 Camden Local Plan

The Camden Local Plan[22] was adopted in 2017 and sets out the Council's planning policies for the long-term development of the Borough for the period 2016-2031.

In relation to air quality the guidance includes Policy CC4 Air Quality which states:

'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

[21] Mayor of London (2018) London Environment Strategy
[22] LBC (2017) Camden Local Plan, 2017

development on air quality. Consideration must be taken to the actions identified in the Councils 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.'

3.4.2 Camden Clean Air Strategy 2019-2034 and Camden's Clean Air Action Plan 2023-2026

The Camden Clean Air Strategy (CCAS) and Clean Air Action Plan (CCAAP)[23] details Camden's long term strategic objectives for clean air in Camden and the actions that the Council intends to take over the next four years to improve air quality. The CCAS sets out a pathway for the Council to achieve stricter WHO air quality guideline limits throughout the borough by 2034 at the latest. These are

- NO_2: 10 µg/m³ by 2034;
- PM_{10}: 15 µg/m³ by 2030; and
- $PM_{2.5}$: 5 µg/m³ by 2034.

The Council has also set interim targets for these pollutants to measure ongoing progress:

- NO_2: 30 µg/m³ by 2026 and 20 µg/m³ by 2030;
- PM_{10}: 20 µg/m³ by 2026; and
- $PM_{2.5}$: 10 µg/m³ by 2030.

Indoor air quality and occupational exposure to air pollution are also addressed.

[23] London Borough Camden (2022) Camden Clean Air Strategy 2019-2034 and Camden Clean Air Action Plan 2023-2026, December 2022

The CCAAP also sets out 36 Clean Air Outcomes and those that have relevance to this report include:

1. Reduce emissions from non-road mobile machinery (NRMM);
2. Reduce emissions from construction generators;
3. Reduce emissions from construction and demolition processes;
4. Reduce emissions from road vehicles serving construction sites;
5. Reduce impacts of HS2 and other major developments or infrastructure projects;
6. Reduce emissions from building heating systems;
7. Reduce emissions from backup diesel generators.

3.5 Air Quality Guidance

3.5.1 DEFRA Technical Guidance

Local authorities are seen to play a particularly important role. Section 82 of the Environment Act 1995 requires every local authority to conduct a review of the air quality from time to time within the authority's area. The recently released DEFRA technical guidance, LAQM.TG(22), describes a new streamlined approach to the Local Air Quality Management (LAQM) regime, whereby every authority has to undertake and submit a single Annual Status Report/Annual Progress Report within its area, to identify whether the objectives have been or will be achieved at relevant locations by the applicable date. If the objectives are not being met, the authority must declare an Air Quality Management Area (section 83 of the Act) and prepare an action plan (section 84) which identifies measures that will be introduced in pursuit of the objectives.

3.5.2 IAQM Land Use Planning and Development Control: Planning for Air Quality

Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) have published joint guidance on the assessment of air quality impacts for planning purpose. This includes information on when an air quality assessment is required, what should be included in an assessment and criteria for assessing the significance of any impacts. The scope of the operational

impact and exposure assessment within this report are based on the guidance set out in this document.

3.5.3 IAQM Guidance on the Assessment of Dust from Demolition and Construction

Guidance produced by the IAQM on assessing impacts from construction and demolition [24]activities includes a methodology for identifying the risk magnitude of potential dust sources associated with demolition, earthworks, construction and trackout. It is then used to identify the level of mitigation necessary in order for the impacts to be no significant. The London SPG 'The Control of Dust and Emissions during Construction and Demolition' is based on this guidance, however, the original document is more detailed and is therefore used to provide additional information where necessary.

3.5.4 Mayor of London The Control of Dust and Emissions during Construction and Demolition SPG

The Mayor of London has published guidance on assessing the risk of significant effects during construction. The approach is based on guidance set out in the IAQM guidance on assessing impacts from construction and demolition activities[25]. Both guidance documents have therefore been used for this assessment. The methodology sets out an initial approach for identifying the risk magnitude of potential dust sources associated with demolition, construction, earthworks and trackout. This is then used to identify the level of mitigation necessary in order for the impacts to be not significant. Mayor of London Air Quality Neutral Guidance

'Air Quality neutral' is a term that refers to developments that do not contribute to air pollution beyond allowable benchmarks, which is a requirement for all development within London to meet the requirements of Policy SI1 of the London Plan. The AQN benchmarks relate to both transport and building emissions and a development must meet both benchmarks separately in order to be AQN.

The London AQN guidance was published in February 2023 and sets out guidance on how to calculate the relevant benchmarks against which developments should be assessed and the

[24] IAQM (2014) Guidance on the Assessment of Dust from Demolition and Construction Version 1.1, February 2014
[25] Mayor of London (2014) The Control of Dust and Emissions During Construction and Demolition SPG

approach to calculating both building and transport emissions specific to a development that should be used to assess the proposals against the calculated benchmarks.

The document also sets out guidance on where a development can be excluded from the AQN calculations and classed as AQN without considering an assessment against the relevant benchmarks.

As detailed in the guidance, where a development is not found to be AQN appropriate on and off-site mitigation measures should be identified and agreed with the local planning authority to sufficiently reduce emissions to achieve AQN status. Where it is not possible to identify appropriate and adequate mitigation the guidance sets out an approach to calculating and agreeing offsetting payments which will be provided to the Local Planning Authority to mitigate air quality impacts within the wider area.

The GLA AQN guidance has been used to assess the development proposals against Policy SI1 of the London Plan.

3.5.5 Camden Planning Guidance on Air Quality

The Camden Planning Guidance (CPG) on Air Quality[26] was adopted on 15th January 2021 and provides information on key air quality issues within the borough and supports Local Plan Policy CC4 Air Quality. The guidance sets out a simplified approach to assessing potential impacts on local air quality in relation to planning applications and has been used to determine the scope of this assessment.

[26] LBC (2021) Camden Planning Guidance on Air Quality, January 2021

4 Methodology

4.1 Baseline Assessment

A baseline assessment of air quality in the vicinity of the Site and the surrounding area has been carried out through a review of monitoring data available within the LBC air quality review and assessment reports, most notably the LBC 2021 Air Quality Annual Status Report (ASR)[27]. Additional data has been obtained from the UK Air Information Resource (UK-AIR) background pollution maps[28].

The results of the baseline assessment have been used to determine the suitability of the Site for employment use and identify whether any mitigation measures are required to reduce exposure.

4.2 Construction Phase

4.2.1 Construction Traffic

During construction of the proposed development, lorries will require access to the Site to deliver and remove materials; earthmoving plant and other mobile machinery will work on site and generators and cranes will also be in operation. These machines produce exhaust emissions; of particular concern are emissions of NO_2 and PM_{10}.

It is anticipated that during the construction phase there would be fewer than 10 heavy duty vehicles (HDV) accessing the Site in any given day (i.e. no more than 20 movements per day). Criteria set out in the Mayor of London's SPG/EPUK/IAQM planning guidance indicate that significant impacts on air quality are unlikely to occur where a development results in less than 25 HDV movements per day within an AQMA and less than 100 per day elsewhere. It is therefore anticipated that construction traffic generated by the proposed development would result in a negligible impact on local NO_2 and PM_{10} concentrations and has not been considered any further in this assessment.

[27] LBC (2021) London Borough Camden Air Quality Annual Status Report, August 2022
[28] https://uk-air.defra.gov.uk/data/laqm-background-home

4.2.2 Construction/Fugitive Dust

Construction phase activities associated with the Proposed Development may result in the generation of fugitive dust emissions (i.e. dust emissions generated by site-specific activities that disperse beyond the construction site boundaries).

If transported beyond the site boundary, dust can have an adverse impact on local air quality. The IAQM has published a guidance document for the assessment of demolition and construction phase impacts[29].The guidance considers the potential for dust nuisance and impacts to human health and ecosystems to occur due to activities carried out during the following stages of construction:

- Demolition (removal of existing structures).
- Earthworks (soil-stripping, ground-levelling, excavation and landscaping).
- Construction (activities involved in the provision of a new structure); and
- Trackout (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

A qualitative assessment of air quality impacts due to the release of fugitive dust and particulates (PM_{10}) during the construction phase was undertaken in accordance with the methodology detailed in the IAQM guidance.

The assessment takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels, thus enabling a level of risk to be assigned. Risks are described in terms of there being a low, medium or high risk of dust impacts.

Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined.

A summary of the IAQM assessment methodology is provided in Appendix B.

[29] IAQM (June 2016) Guidance on the assessment of dust from demolition and construction Version 1.1

4.3 Operational Phase

The Camden Air Quality Planning Guidance sets out criteria for determining when a development will require an air quality assessment and the level of assessment that is required. An air quality assessment is required where any of the following apply:

- Major applications where occupants will be exposed to poor air quality (along a busy road, diesel railway lines or in a generally congested area);
- Development that has potential to significantly change road traffic on a busy road;
- The development has more than 75 new residences;
- Commercial developments with a floorspace of 2,500 m^2 or more;
- Developments that include biomass boilers or CHP (combined heat and power) and connections to existing decentralised energy networks (whereby the increased capacity is not already covered by an existing AQA;
- Substantial earthworks or demolition; and
- Development that introduces sensitive uses into an area of poor air quality.

Section 3.3 also states that a basic assessment will be required for all newly erected buildings/substantial refurbishments and changes of use where occupants will be exposed to poor air quality.

The development proposals have been assessed against the above criteria in accordance with Table 1 of the Camden air quality guidance. Further details are provided in Section 6.

4.4 Air Quality Neutral Assessment

The London Plan requires all developments in London to be Air Quality neutral (AQN).

The GLA AQN guidance, published in February 2023, has been used for undertaking the assessment. The guidance sets out benchmarks for different land use classes against which the calculated transport and building emissions from a development can be compared. Where a development falls below these benchmarks it can be classed as ‘Air Quality Neutral’ and no mitigation is considered necessary.

5 Baseline Assessment

5.1 LBC Air Quality Monitoring

5.1.1 NO_2 Concentrations

LBC currently operates five automatic monitoring stations within the borough recording concentrations of NO_2 and PM_{10}. The closest of these to the Site, is an urban background automatic monitoring station in London Bloomsbury (BL0) located approximately 0.38 km north northeast of the Site. Details of the monitoring station and NO_2 concentrations recorded since 2018 are presented in Tables 5.1 and 5.2 below. The location of the monitoring site is shown in Figure 5.1.

Table 5.1: NO_2 Concentrations Measured at London Bloomsbury Automatic Site (μgm^{-3})

Site	Classification	Grid Reference	Year				
			2018	2019	2020[1]	2021[1]	2022[2]
BL0 London Bloomsbury (Russell Square Gardens)	Urban Background	530123, 182014	36	32	28	27	26
Data taken from LBC 2021 Air Quality Annual Status Report (ASR) [1] data for 2020 and 2021 has been included for consistency purposes only. Due to the travel restrictions as a result of the COVID-19 pandemic, pollution levels during 2020and 2021 were significantly suppressed. Data from these years is therefore not considered representative of normal conditions and has not been used to inform the baseline assessment. [2] Data taken from AQE website https://www.airqualityengland.co.uk/site/data							

Table 5.2: Number of Exceedences of the Hourly NO_2 Objective Measured at London Bloomsbury

Site	Classification	Grid Reference	Year				
			2018	2019	2020	2021[1]	2022
BL0 London Bloomsbury (Russell Square Gardens)	Urban Background	530123, 182014	0	0	0	0	0
Data taken from LBC 2021 Air Quality Annual Status Report (ASR) & AQE website [1] data for 2020 and 2021 has been included for consistency purposes only. Due to the travel restrictions as a result of the COVID-19 pandemic, pollution levels during 2020and 2021 were significantly suppressed. Data from these years is therefore not considered representative of normal conditions and has not been used to inform the baseline assessment.							

The monitoring data shows annual mean NO_2 concentrations to be below the objective limit of 40 µg/m³ at the London Bloomsbury site during all years. The 1-hour mean objective has also not been exceeded at the site for the monitoring period. The monitoring site also meets Camden's interim NO_2 target of 30 µg/m³ by 2026 but does not meet the interim NO_2 targets of either 20 µg/m³ by 2030 of the stricter 10 µg/m³ by 2034.

Data at the site shows an overall downward trend in concentrations since 2018.

LBC also operate an extensive network of passive diffusion which monitor concentrations across the borough. The closest sites to the proposed development are tubes CA21 adjacent to Bloomsbury Street approximately 0.025 km to the west northwest ; CA11 adjacent to Tottenham Court Road approximately 0.43 km to the west northwest; CA29 Endsleigh Gardens approximately 0.9 km to the north northwest and CA10 adjacent to Tavistock Gardens approximately 0.7 km to the north northwest. Details of the sites and data recorded over the last 5 years are provided in Table 5.3. The locations of the monitoring sites are shown in Figure 5.1.

In addition, NO_2 diffusion tube monitoring is also undertaken at a number of schools, as part of the Healthy School Streets initiative. There are three sites located within 0.25 km of the Site and data recorded over the last two years is provided in Table 5.3, with locations shown in Figure 5.1.

Table 5.3: NO_2 Diffusion Tube Monitoring Results 2017-2021 (µg/m³)

Site	Classification	Year				
		2018	2019	2020	2021[1]	2022
CA21 Bloomsbury Street (CAM86)	K	**59.4**	**49.6**	29.5	33.2	30.8
CA11 Tottenham Court Road (CAM81)	K	**65.8**	**62.6**	**43.3**	**44.4**	39.9
CA29 Endsleigh Gardens	R	-	-	**42.6**	35.3	35.5
CA10 Tavistock Gardens	UB	**46.2**	35.4	33.9	26.8	22.3
CAM13 Ecole Jeannine Manuel Bedford Sq South	-	-	-	-	22.9	22.6
CAM15 Ecole Jeannine Manuel Bedford Sq North	-	-	-	-	24.1	24.3

Site	Classification	Year				
		2018	2019	2020	2021[1]	2022
CAM14 Ecole Jeannine Manuel Bedford Avenue Adeline Place and Morwell Street	-	-	-	-	26.2	27.0

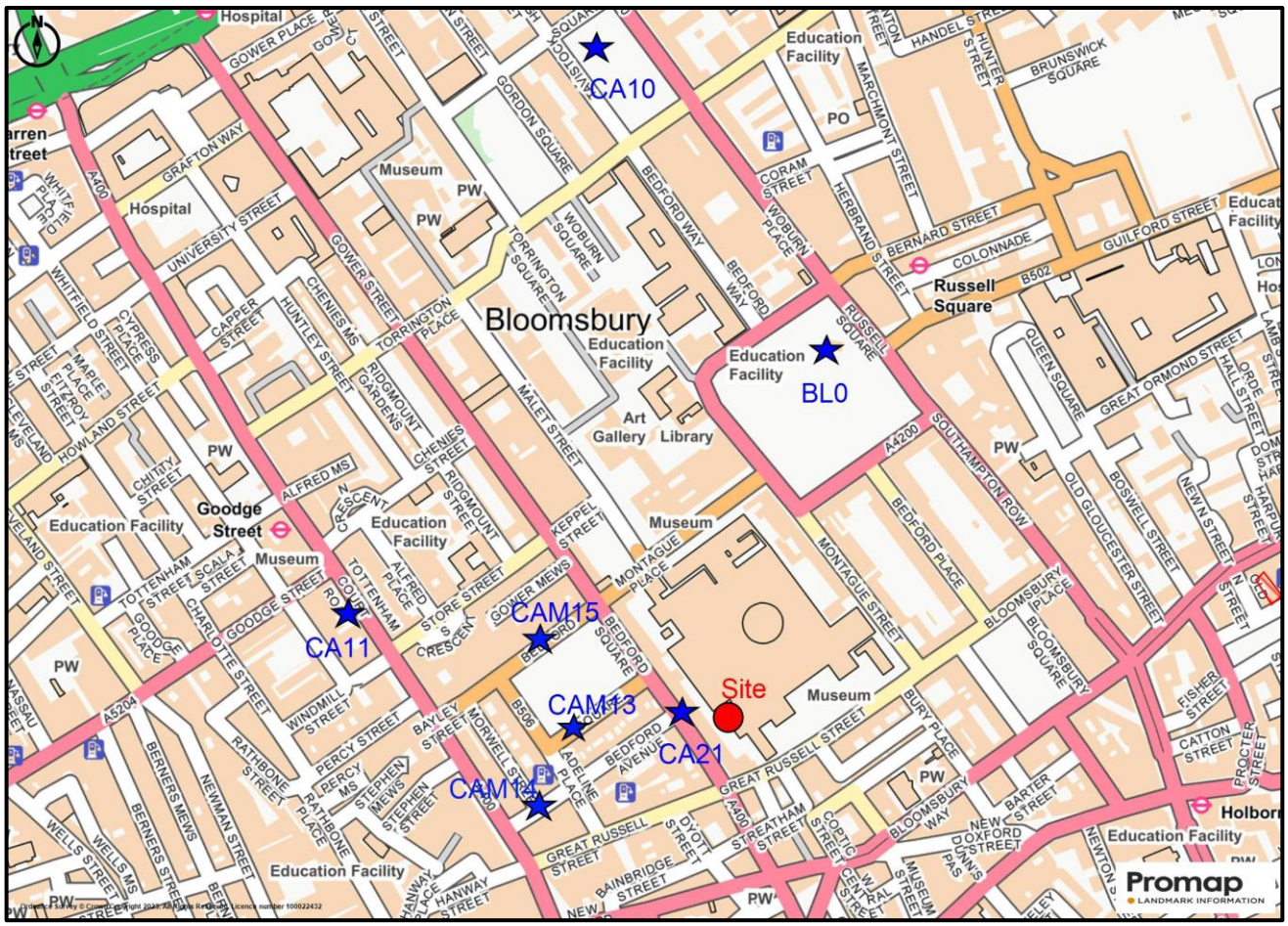
Data in **BOLD** shows an exceedance of the annual mean objective

Data in **BOLD and underlined** indicate a possible exceedance of the hourly NO_2 objective of 60µg/m³

K-Kerbside, R- Roadside, UB – Urban Background

[1]As a result of the Covid-19 pandemic and associated behavioral changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this assessment.

Figure 5.1: Location of Monitoring Sites



Diffusion tubes are a passive form of monitoring, which, due to their relative in-expense, allow for a much greater spatial coverage than with automatic monitoring sites. Diffusion tubes are acknowledged as a less accurate method of monitoring ambient air pollutants than automatic monitors, with diffusion tubes over or under estimating concentrations by as much as 30 %. To allow the results to be reliably compared with the AQ Objectives, the data should be bias corrected using factors calculated from a co-location site where both diffusion tubes and an automatic monitor are located in the same location. The data provided in Table 5.3 has been adjusted by LBC using appropriately derived adjustment factors.

The monitoring data presented in Table 5.3 shows annual mean NO_2 concentrations were below the objective limit of 40µg/m^3 at all the sites during 2022 but exceedances occurred at CA21 (Bloomsbury Street) in 2018 and 2019; CA11 (Tottenham Court Road) in 2018, 2019, 2020 and 2021 and CA29 (Endsleigh Gardens) in 2019. The monitoring sites CA10, CAM13, CAM15 and CAM14 also meet Camden's interim NO_2 target of 30 µg/m³ by 2026, although it is noted that concentrations exceed the Camden 2030 target of 20 µg/m³ and the stricter 2034 target of 10 µg/m³..

The data indicates an overall downward trend in concentrations over the five years period presented.

Diffusion tubes cannot monitor short-term NO_2 concentrations, however, research[30] has concluded that exceedances of the 1-hour mean objective are generally unlikely to occur where annual mean concentrations do not exceed 60 µg/m^3. Based on monitoring data presented in Table 5.3, it is unlikely that the short-term objective is being exceeded at any of the monitoring location.

5.1.2 PM Concentrations

LBC also monitor PM_{10} concentrations at four locations within the borough. Monitoring data at London Bloomsbury, which is the closest site, are set out in Tables 5.4 and 5.5.

[30] D Laxen and B Marner: Analysis of the relationship between 1-hour and annual mean nitrogen dioxide at UK roadside and kerbside monitoring sites (July 2003).

$PM_{2.5}$ is also measured at the London Bloomsbury site and the data is presented in Table 5.6.

Table 5.4: Annual Average PM_{10} Concentrations Measured at London Bloomsbury (µgm^{-3})

Site	Classification	Year				
		2018	2019	2020[1]	2021[1]	2022
BL0 London Bloomsbury	Urban Background	17	18	16	16	17
[1]As a result of the Covid-19 pandemic and associated behavioral changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this assessment.						

The data set out in Table 5.5 shows annual mean PM_{10} concentrations below the annual mean objective of 40 µg/m^3 for all years since 2018 at the London Bloomsbury site. The monitoring site also meets Camden's interim PM_{10} target of 20 µg/m^3 to be achieved by 2026 but not the stricter 15 µg/m^3 to be achieved by 2030.

The data indicates no significant upward or downward trend during the monitoring period.

Table 5.5: Number of Exceedances of the 24-hour PM_{10} Objective Measured at London Bloomsbury (µgm^{-3})

Site	Classification	Year				
		2018	2019	2020	2021[1]	2022[2]
BL0 London Bloomsbury	Urban Background	**1**	9	4	0	4
[1]As a result of the Covid-19 pandemic and associated behavioral changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this assessment.						

Exceedances of the 24-hour objective has been recorded at the site, (Table 5.5) however, the objective allows for up to 35 exceedances of the limit in any given year, therefore the objective has been met during all monitoring years presented at London Bloomsbury.

Table 5.6: Annual Average $PM_{2.5}$ Objective Measured at London Bloomsbury (μgm^{-3})

Site	Classification	Year				
		2018	2019	2020	2021[1]	2022
BL0 London Bloomsbury	Urban Background	**10.4**	11	9	9	8
[1]As a result of the Covid-19 pandemic and associated behavioral changes and measures implemented by the governing authorities (e.g. lockdowns, travel restrictions etc.) measured concentrations during 2020 are not considered to be representative of 'normal' conditions. As such, measured 2020 concentrations are presented for information only, and have not been discussed or given weight in determining the conclusions of this assessment.						

Data set out in Table 5.6 shows annual mean $PM_{2.5}$ concentrations below both the long term annual mean target of 10 µg/m^3 and the interim target of 12 µg/m^3 at the monitoring location in 2022. The monitoring site meets the Camden interim $PM_{2.5}$ target of 10 µg/m^3 to be achieved by 2030 but exceeds the stricter 5 µg/m^3 to be achieved by 2034.

5.2 Defra Background Maps

Additional information on estimated background pollutant concentrations has been obtained from the Defra background maps provided on the UK-AIR, the Air Quality Information Resource (http://uk-air.defra.gov.uk/). Estimated air pollution concentrations for oxides of nitrogen (NO_x), NO_2, PM_{10} and $PM_{2.5}$ have been extracted from the 2018 background pollution maps for the UK, which were published in August 2020. These maps are available in 1 km x 1 km grid squares and provide an estimate of concentrations between 2018 and 2030. The average concentrations for the grid square representing the Site have been extracted for the 2022 base year. The data is provided in Table 5.2.

The NO_x and PM_{10} background maps are provided not only as total concentrations but are also broken down into sector contributions (i.e. motorways and rail). However, as this assessment is considering the impact of the proposed development on existing air quality, background concentrations from all sources should be considered. The data presented in Table 5.7 provides total background concentrations of both pollutants.

Table 5.7: Annual Mean Background Air Pollution Concentrations in 2022

Location (OS Grid Squares)	Annual mean concentrations (µgm^{-3})		
	Nitrogen dioxide	PM_{10}	$PM_{2.5}$
530500,181500	40.6	18.9	12.2

The data indicates that existing background concentrations are currently exceeding the NO_2 annual mean objective limit of 40 µg/m³ and the $PM_{2.5}$ interim and long-term targets but meeting the PM_{10} objectives in the vicinity of the Site.

5.3 Air Quality at the Development Site

The proposed development would not provide any sensitive receptors (i.e. residential, educational or health receptors). Due to the transient nature of users of the Site the annual mean and 24-hour objective limits do not apply. However, the short-term objective limits such as the 1-hour NO_2 objective are considered relevant to the Site. Exposure at the Site should therefore be considered in relation to the 1-hour NO_2 objective but not in relation to the PM objective limits.

The automatic monitoring site in Russell Gardens and the diffusion tube site in Tavistock Gardens are considered representative of the air quality at the development site and data for these sites presented in Tables 5.2 and 5.3, indicates annual mean concentrations of NO_2 in the area are well below 60 µg/m^3. It can therefore be concluded that concentrations at the Site are also below 60 µg/m^3. Short-term NO_2 concentrations at the Site are therefore expected to be meeting the 1-hour objective limit for this pollutant.

The development would not introduce new employment use into a location of poor air quality, the impact of the proposals in terms of new exposure is therefore negligible.

6 Assessment Against Camden Air Quality Planning Guidance

Table 1 within the Camden Air Quality Planning Guidance sets out criteria on the level of air quality assessment required to accompany a planning application for a proposed development. The proposed development has been assessed against the criteria set out in Table 7.1. Those associated with the proposed development are highlighted in orange.

Table 7.1: Air Quality Assessment Triggers

Criteria Met →				**Assessments Required →**		
Scale	**Area of poor air quality[1]**	**Scheme brings sensitive receptors**	**Scheme bring air quality impacts[2]**	**Air Quality Assessment type**	**Air Quality Neutral**	**Construction and Demolition Impacts**
Major	Yes	Yes	Yes	Detailed	Required	Required
			No			
		No	Yes	Detailed		
			No	Basic		
	No	Yes	Yes	Detailed		
			No	Basic		
		No	Yes	Detailed		
			No	Basic		
Minor	Yes	Yes	Yes	Detailed	Not required	Not required
			No	Basic		
		No	Yes	Basic		
			No	Not required		
	No	Yes	Yes	Detailed		
			No	Not required		
		No	Yes	Basic		
			No	Not required		

[1] Area of poor air quality – an area with NO_2 or PM_{10} concentrations within 5% below the air quality objective, 38 µg/m³

2 Air quality impacts – produces changes in emissions from building sources, small industrial processes (including generators for emergency backup power, Short Term Operating Reserve and similar), or vehicle movements. (STOR power generators are those used intermittently to supply intensive amounts of electricity to the grid at short notice.)

Section 3 of the Camden Air Quality Planning Guidance states that 'A*ir quality neutral assessments are required for all major developments. Major developments are schemes of 10 or more dwellings or buildings where the floorspace created is 1,000 square metres or more'.* The proposed development has a GIA of approximately 2,200 m^2 which is above 1,000m^2 so would be classed as 'major' development. An Air Quality Neutral assessment is therefore required as shown in Table 7.1.

The proposed development is in an area of poor air quality as the estimated NO_2 background concentrations based on the Defra background maps exceed 40 µg/m^3 (section 5.2), however the scheme will not introduce sensitive receptors as it is primarily for housing plant and additional office space(i.e. a workplace environment). Due to the transient nature of users of the Site only the short-term NO_2 objective would apply at this location in terms of exposure. The baseline assessment has shown that short-term NO_2 concentrations at the Site would be below the objective limit and therefore impacts in terms of exposure would be negligible.

As detailed in section 2.2, the existing gas boilers installed in the existing South West Bouler House building will be removed and replaced with the new ASHPs. 2 no. duty/standby life-saving diesel generators will be housed on the ground floor of the new SWEC building in replacement of the existing diesel generator to enhance the estates existing emergency power network. These generators will operate for no more than 12 hours per year (based on the proposed testing regime of 30 minute per month per generator, 6 hours each per year). Emissions associated with the generators would be emitted via a flue terminating 1 m above roof level of the building. The height of the existing South West Boiler House building is approximately 24m above ground level and approximately 6 m above the height of the nearby residential building on Bloomsbury Street i..e 40 Bloomsbury Street. The flue will therefore terminate at 25 m above ground level and 7 m above the nearby residential buildings, as shown in Figure 6.1. Furthermore, the flue is located over 20 m from the nearest receptors (residential properties on Bloomsbury Street) as indicated in Figure 6.1.

The flue height, above the surrounding buildings and separated by 20 m, would prevent any significant building downwash to the emissions ensuring good dispersion. Given the intermittent and short-term nature of the operation of the generators and the elevated flue dispersion height, combined with a separation distance of over 20 m from the nearest building, there is a very low risk of significant impacts on local air quality and therefore based on professional judgement the effects from the generators would be negligible.

Based on the triggers, as detailed in Table 7.1, a ‘detailed ’ air quality assessment is required including an Air Quality Neutral Assessment and an construction and demolition impact assessment. However, as there will be no operational vehicle movements associated with the development and emissions from the life-saving generators are unlikely to be significant, the requirement for a detailed assessment has been scoped out of the assessment. A ‘basic’ Air Quality Assessment has therefore been carried out.

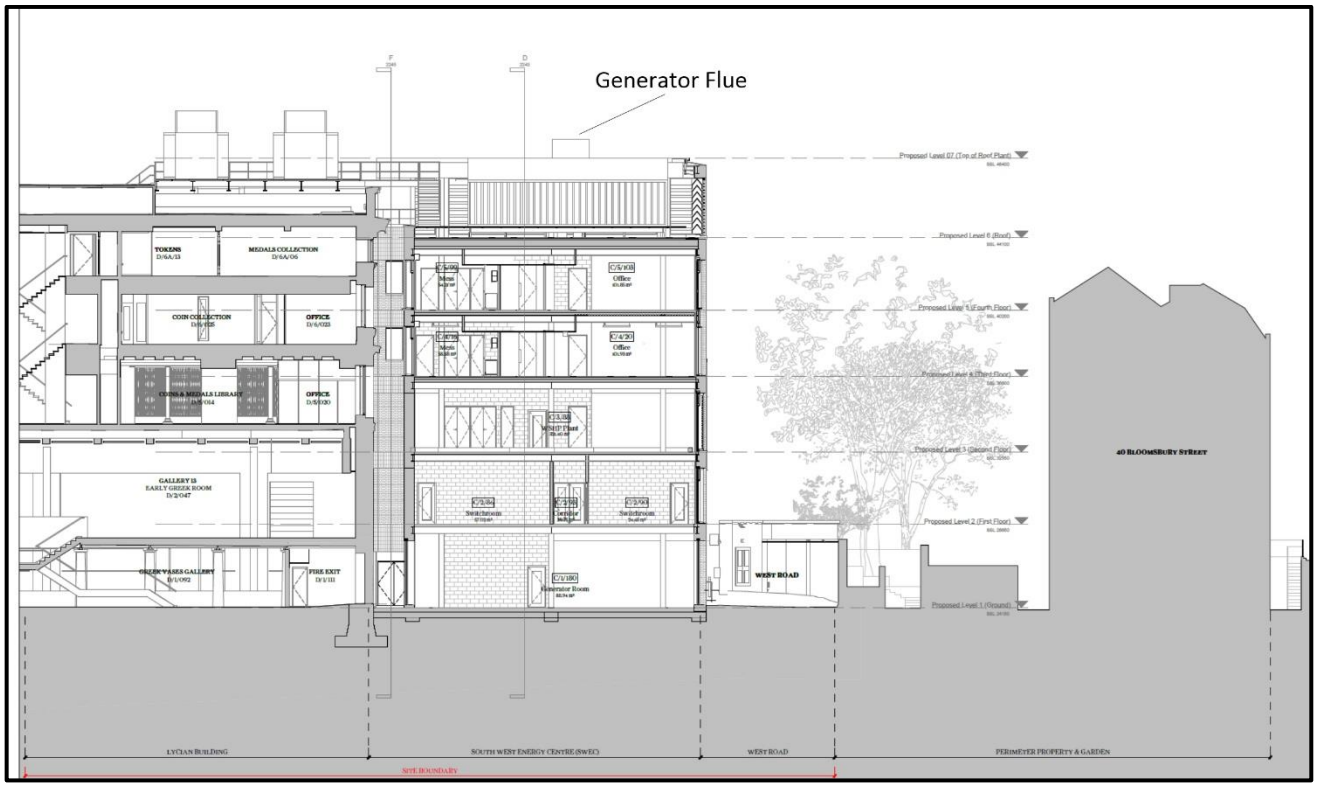


Figure 6.1: Building and Flue Heights and Flue Separation Distance

7 Construction Assessment

7.1 Assessing the Risk of Dust Effects

7.1.1 Site and Surroundings

A summary of the proposed development is provided in Section 2 of this report.

The Site covers an area of approximately 1,090 m^2. A review of surrounding land uses indicates that there are residential properties located within 350 m to the west, south and southeast of the Site. The site of the ISS also lies within close proximity to sensitive receptors including listed buildings. An assessment of construction related impacts in relation to human receptors is therefore considered necessary.

Significant impacts on ecologically sensitive receptors are unlikely to occur beyond 50 m from any construction activities. A review of data held on the Defra MAGIC website[31] shows no sites designated as important for wildlife within 50 m of the Site therefore impacts on ecological receptors has not been considered any further within this assessment.

A review of background data published by Defra within the 2023 background maps, indicates background concentrations at the Site in the region of 18-19 $\mu g/m^3$, at 45 % of the annual mean objective. It is therefore expected, based on professional judgement, that concentrations at roadside locations are unlikely to be higher than 24 $\mu g/m^3$, making the surrounding area low in sensitivity to human health impacts.

The precise behaviour of the dust, its residence time in the atmosphere, and the distance it may travel before being deposited would depend upon a number of factors. These include wind direction and strength, local topography and the presence of intervening structures (buildings, etc.) that may intercept dust before it reaches sensitive locations. Furthermore, dust would be naturally suppressed by rainfall.

[31] http://magic.defra.gov.uk/

A windrose from the Heathrow Meteorological Station for 2022 is provided below in Figure 6.1, which shows that the prevailing wind is predominantly from the southwest. Receptors located to the northeast of the Site are therefore most at risk of experiencing impacts, which includes the British Museum which are of high sensitivity to dust effects.

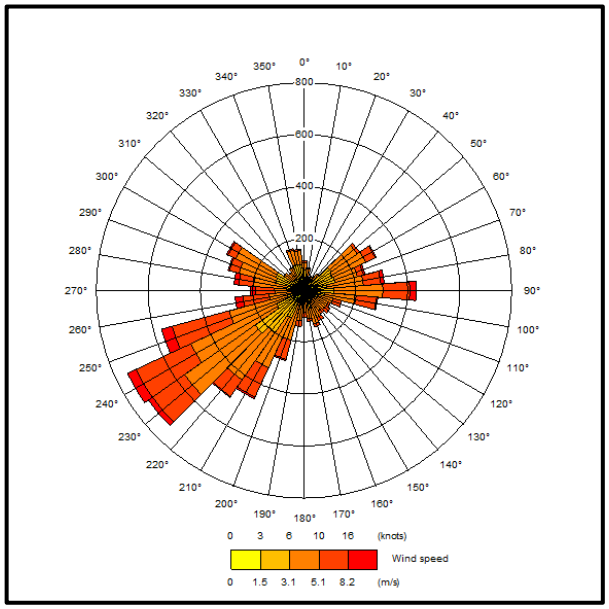


Figure 6.1: Windrose from Heathrow Meteorological Site (2022)

7.1.2 Risk Assessment of Dust Impacts

Defining the Dust Emission Magnitude

With reference to the criteria detailed in Appendix B, the dust emission magnitude for each of the categories demolition, earthworks, construction and trackout have been determined. These have been summarised in Table 6.1.

Table 6.1: Dust Emission Magnitude for each Activity

Activity	Criteria	Magnitude
Demolition	The exiting South West Boiler House will require demolishing prior to construction. The total building volume is <20,000 m^3. The portacabins on the ISS site will also require demolition. These are less than 20,000 m^3	Small

Earthworks	Site area of SWEC building approx. 1,090m², 5-7 HDV, soil type is sand to loamy [32]. The ISS site is smaller than the SWEC site and there would be limited space for on-site HDV	Small
Construction	Total build volume for SWEC and the ISS <25,000 m³, brick and concrete	Small
Trackout	<10HDV per day	Small

Sensitivity of Surrounding Area

Using the criteria set out in Tables B1 to B3, Appendix B, the sensitivity of the surrounding area to impacts from dust emissions has been determined and are set out in Table 6.2.

Dust Soiling

The nearest residential properties are located on the western side of Bloomsbury Street. Properties along the eastern side of Bloomsbury Street and immediately west of the Site are all owned by the British Museum and have been converted for commercial purposes. Within this block of properties there is the Gresham Hotel at 36-38 Bloomsbury Street. The property shares the boundary with the proposed development Site. The nearest residential receptors are 30 m to the west on Bloomsbury Street opposite the commercial premises. There are further residential premises approximately 50 m to the west on Bedford Avenue where there are approximately 150 apartments/flats. Kenilworth Hotel lies approximately 40 m to the south southwest of the Site. The Ecole Jeannine Manuel school also lies approximately 115 m west southwest of the Site. The residential properties along Bloomsbury Street would have a high sensitivity to dust effects while the Gresham Hotel is considered to be of medium sensitivity, as would the surrounding commercial premises.. Based on the separation distance between the construction activities and the nearest receptors the overall sensitivity of the surrounding area to dust effects associated with the SWEC is considered to be 'medium'.

[32] UK Soil Observatory http://mapapps2.bgs.ac.uk/ukso/home.html

In relation to the ISS site, this is immediately adjacent to the White Wing which is a listed building and of high importance. There are other listed buildings in the vicinity. The sensitivity of the area in the vicinity of the ISS building is considered to be 'high'.

It is expected that there will less than 10 HDV (>3.5t) movements per day during the construction phase which are expected to travel to and from the Site along Great Russell Street. As a general guide, significant impacts from trackout may occur up to 500 m from large sites, 250 m from medium sites and 50 m from small sites, as measured from the site exit. There are several residential properties located along Great Russell Street. The listed buildings in the vicinity of the ISS building will also be sensitive. The sensitivity of the area to dust soiling effects from trackout is therefore considered to be 'high'.

PM_{10} Effects

As previously discussed, annual mean PM_{10} concentrations in the vicinity of the Site are expected to be below 24 µg/m^3. Based on the proximity of sensitive receptors to the site boundary and the local concentrations of PM_{10} the sensitivity of the surrounding area is considered to be low with regards human health impacts.

Table 6.2: Sensitivity of Surrounding Area

Source	**Dust Soiling**		**Human health**	
	SWEC	**ISS**	**SWEC**	**ISS**
Demolition	Medium	High	Low	Low
Earthworks	Medium	High	Low	Low
Construction	Medium	High	Low	Low
Trackout	High	High	Low	Low

Defining the Risk of Impacts

The dust emission magnitude, as set out in Table 6.1, is combined with the sensitivity of the area (Table 6.2) to determine the risk of both dust soiling and human health impacts, assuming no mitigation measures applied at site. The risk of impacts associated with each activity is provided in Table 6.3 below and has been used to identify site-specific mitigation measures, which are discussed in Section 6.2 and set out in Appendix C.

Table 6.3: Summary of Risk Effects to Define Site Specific Mitigation

Source	Dust Soiling		Human health	
	SWEC	**ISS**	**SWEC**	**ISS**
Demolition	Low Risk	Medium Risk	Negligible Risk	Negligible Risk
Earthworks	Low Risk	Medium Risk	Negligible Risk	Negligible Risk
Construction	Low Risk	Medium Risk	Negligible Risk	Negligible Risk
Trackout	Low Risk	Medium Risk	Negligible Risk	Negligible Risk

7.2 Determining Appropriate Mitigation

The control of dust emissions from construction site activities relies upon management provisions and mitigation techniques to reduce emissions of dust and limit dispersion. Where dust emission controls have been used effectively, large-scale operations have been successfully undertaken without impacts to nearby properties.

An overall low risk of impacts is predicted at adjacent receptors during construction, demolition and trackout of the proposed development. Appropriate mitigation measures for the Site have been identified following the IAQM guidance and based on the risk effects presented in Table 6.3. It is recommended that the measures set out in Appendix C are incorporated into a DMP and approved by prior to commencement of any work on site.

Based on the risk effects identified during each of the four types of activities and following implementation of the recommended mitigation measures, the significance of residual impacts during construction of the proposed development will be **negligible.**

8 Air Quality Nuetral Assessment

8.1.1 Building Emissions

As detailed in the AQN guidance '*backup plant installed for emergency and life safety power supply, such as diesel generators, may be excluded from the calculation of predicted building emissions'*.

The main energy source for the Site will be from Air Source Heat Pumps and electric heaters/water heaters. As a result there will be no on-site building emissions and the proposals will be air quality neutral in respect of building emissions.

8.1.2 Traffic Emissions

There will be no vehicle parking on site and the proposed development will not generate any traffic. Therefore, the development is considered to be air quality neutral in respect of transport emissions.

9 Conclusion

Encon Associates were commissioned by The British Museum (the 'Client') to carry out an air quality assessment in connection with the proposed redevelopment of a building within the British Museum Site, Great Russell Street, London (the 'Site'). The proposals are for the demolition of the existing South West Boiler House building, located to the rear of 36-42 Bloomsbury Street and the construction of a new SWEC building to primarily house a new energy centre serving the rest the Site.

It is inevitable that with any development, demolition and construction activities will cause some disturbance to those nearby. Dust arising from most construction activities tends to be of a coarse nature, which through dispersion by the wind can lead to soiling of property including windows, cars, external paintwork and laundry. However, as well as giving rise to annoyance due to soiling of surfaces from dust emissions, there is evidence of major construction activities causing increases in long term PM_{10} concentrations and in the number of days exceeding the short term PM_{10} objective of 50 μgm^{-3}.

The IAQM guidance on assessing impacts on air quality from construction activities and determining the likely significance has been used to determine the risk of impacts occurring during the construction of the development and to identify appropriate mitigation measures to be implemented on site to reduce dust emissions and associated impacts.

Due to the proximity of nearby residential receptors the Site is considered to have a low risk of impacts with regards to dust soiling during demolition, construction and trackout. The site is considered to have a negligible risk with regards to PM_{10} concentrations. However, following the implementation of appropriate mitigation measures impacts associated with the construction of the development are likely to be insignificant.

The baseline assessment has concluded that pollution levels at the Site are currently meeting the relevant air quality objective limits for NO_2, PM_{10} and $PM_{2.5}$. The Site is therefore considered suitable for employment development and impacts in terms of new exposure would be negligible.

A review of the proposed life-saving diesel generators shows that the risk of significant effects on local air quality will be low due to the emissions flue terminating over 7 m above the nearest building and having a separation distance of over 20 m from the nearest building. Dispersion of emissions will not therefore be hampered by significant downwash and dispersion of emissions will be good.

The development has been assessed against Policy S1 of the London Plan and has been found to be air quality neutral in respect of both building and transport emissions.

The proposed development would meet current national and local planning policy and based on the results of this assessment air quality does not pose a constraint to development of the Site for the proposed use.

Appendix A
Glossary of Terminology

Term	Definition
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year. Usually this is for a calendar year, but some species are reported for the period April to March, known as a pollution year. This period avoids splitting winter season between 2 years, which is useful for pollutants that have higher concentrations during the winter months.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
Exceedance	A period of time where the concentrations of a pollutant is greater than, or equal to, the appropriate air quality standard.
Fugitive emissions	Emissions arising from the passage of vehicles that do not arise from the exhaust system.
LAQM	Local Air Quality Management.
NO	Nitrogen monoxide, a.k.a. nitric oxide.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides.
O_3	Ozone.
Percentile	The percentage of results below a given value.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
Ratification (Monitoring)	Involves a critical review of all information relating to a data set, in order to amend or reject the data. When the data have been ratified they represent the final data to be used (see also validation).
μgm^{-3} micrograms per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of $1ug/m^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.
UKAS	United Kingdom Accreditation Service.
Uncertainty	A measure, associated with the result of a measurement, which characterizes the range of values within which the true value is expected to lie. Uncertainty is usually expressed as the range within which the true value is expected to lie with a 95% probability, where standard statistical and other procedures have been used to evaluate this figure. Uncertainty is more clearly defined than the

Term	Definition
	closely related parameter 'accuracy', and has replaced it on recent European legislation.
USA	Updating and Screening Assessment.
Validation (modelling)	Refers to the general comparison of modelled results against monitoring data carried out by model developers.
Validation (monitoring)	Screening monitoring data by visual examination to check for spurious and unusual measurements (see also ratification).
Verification (modelling)	Comparison of modelled results versus any local monitoring data at relevant locations.

Appendix B
IAQM Construction Impact Assessment Procedure

In order to assess the potential impacts, the activities on construction sites are divided into four categories. These are:

- demolition (removal of existing structures).
- earthworks (soil-stripping, ground-levelling, excavation and landscaping).
- construction (activities involved in the provision of a new structure); and
- trackout (the transport of dust and dirt from the construction site onto the public road network where it may be deposited and then re-suspended by vehicles using the network).

For each activity, the risk of dust annoyance, health and ecological impact is determined using three risk categories: low, medium and high risk. The risk category may be different for each of the four activities. The risk magnitude identified for each of the construction activities is then compared to the number of sensitive receptors in the near vicinity of the site in order to determine the risks posed by the construction activities to these receptors.

Step 1: Screen the Need for an Assessment

The first step is to screen the requirement for a more detailed assessment. An assessment is required where there is:

- a ‘human receptor’ within 350m of the boundary of the site or 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- an ‘ecological receptor’ within 50m of the boundary of the site; or 50m of the route(s) used by the construction vehicles on the public highway, up to 500m from the site entrance(s).

Step 2A: Define the Potential Dust Emission Magnitude

This is based on the scale of the anticipated works and the proximity of nearby receptors. The risk is classified as small, medium or large for each of the four categories.

Demolition: The potential dust emission classes for demolition are:

- Large: Total building volume >50,000m^3, potentially dusty construction material (e.g. Concrete), on site crushing and screening, demolition activities >20m above ground level.
- Medium: total building volume 20,000m^3 – 50,000m^3, potentially dusty construction material, demolition activities 10-20 m above ground level; and
- Small: total building volume <20,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

Earthworks: This involves excavating material, haulage, tipping and stockpiling. The potential dust emission classes for earthworks are:

- Large: Total site area >10,000m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes;
- Medium: Total site area 2,500 m^2 – 10,000m^2, moderately dusty soil (e.g. silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4m – 8m in height, total material moved 20,000 tonnes- 100,000 tonnes; and
- Small: Total site area <2,500m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height, total material moved <20,000 tonnes, earthworks during wetter months.

Construction: The important issues here when determining the potential dust emission magnitude include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. The categories are:

- Large: Total building volume >100,000m^3, on site concrete batching, sandblasting.
- Medium: Total building volume 25,000m^3 – 100,000m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume <25,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Trackout: The risk of impacts occurring during trackout is predominantly dependent on the number of vehicles accessing the Site on a daily basis. However, vehicle size and speed, the duration of activities and local geology are also factors which are used to determine the emission class of the Site as a result of trackout. The categories are:

- Large: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100m.
- Medium: 10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content, unpaved road length 50-100m; and
- Small: <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length >50m.

Step 2B: Defining the Sensitivity of the Area

The sensitivity of the area is defined for dust soiling, human health (PM_{10}) and ecological receptors. The sensitivity of the area takes into account the following factors:

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

Table B1 is used to define the sensitivity of different types of receptors to dust soiling, health effects and ecological effects.

Based on the sensitivities assigned to the different receptors surrounding the site and numbers of receptors within certain distances of the site, a sensitivity classification can be defined for each. Tables B2 to B4 indicate the criteria used to determine the sensitivity of the area to dust soiling, human health and ecological impacts.

Table B1: Examples of Factors Defining Sensitivity of an Area			
Sensitivity of Area	**Dust Soiling**	**Human Receptors**	**Ecological Receptors**
High	Users can reasonably expect enjoyment of a high level of amenity The appearance, aesthetics or value of their property would be diminished by soiling' 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. E.g. dwellings, museums and other important collections, medium and long term car parks and car showrooms.	10 – 100 dwellings within 20 m of site. Local PM_{10} concentrations close to the objective (e.g. annual mean 36 -40 $\mu g/m^3$). E.g. residential properties, hospitals, schools and residential care homes.	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red List for Great Britain. E.g. A Special Area of Conservation (SAC).
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. The appearance, aesthetics or value of their property could be diminished by soiling 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. E.g. parks and places of work.	Less than 10 receptors within 20 m. Local PM_{10} concentrations below the objective (e.g. annual mean 30-36 $\mu g/m^3$). E.g. office and shop workers but will generally not include workers occupationally exposed to PM_{10} as protection is covered by the Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition E.g. A Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected. Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. 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. E.g. playing fields, farmland unless commercially sensitive horticultural, footpaths, short lived car [parks and roads.	Locations where human exposure is transient. No receptors within 20 m. Local PM_{10} concentrations well below the objectives (less than 75%). E.g. public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. E.g. Local Nature Reserve with dust sensitive features.

Table B2: Sensitivity of the Area to Dust Soiling on People and Property					
Receptor Sensitivity	**Number of Receptors**	**Distance from the Source (m)**			
		<20	**<50**	**<100**	**<350**
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 B3: Sensitivity of the Area to Human Health Impacts							
Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number of Receptors**	**Distance from Source (m)**				
			<20	**<50**	**<100**	**<200**	**<350**
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low	Low

Table B3: Sensitivity of the Area to Human Health Impacts							
Receptor Sensitivity	**Annual Mean PM_{10} Concentration**	**Number of Receptors**	**Distance from Source (m)**				
			<20	**<50**	**<100**	**<200**	**<350**
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table B4: Sensitivity of the Area to Ecological Impacts		
Receptor Sensitivity	**Distance from the Source (m)**	
	<20	**<50**
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Define the Risk of Impacts

The final step is to combine the dust emission magnitude determined in step 2A with the sensitivity of the area determined in step 2B to determine the risk of impacts with no mitigation applied. Tables B5 to B7 indicate the method used to assign the level of risk for each construction activity. The identified level of risk is then used to determine measures for inclusion within a site-specific Construction Management Plan (CMP) aimed at reducing dust emissions and hence reducing the impact of the construction phase on nearby receptors. The mitigation measures are drawn from detailed mitigation set out within the IAQM guidance document.

Table B5: Risk of Dust Impacts from Demolition			
Sensitivity of Area	**Large**	**Medium**	**Small**
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table B6: Risk of Dust Impacts from Earthworks/ Construction			
Sensitivity of Area	**Large**	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table B7: Risk of Dust Impacts from Trackout			
Sensitivity of Area	**Large**	**Medium**	**Small**
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Appendix C
Construction Mitigation Measures

It is recommended that the following measures are incorporated into a DMP and approved by LBC prior to commencement of any work on site. The measures set out below summaries the measures set out within the IAQM guidance

This guidance should be read in conjunction with this report to obtain full details of all the measures that should be applied on site.

- display the name and contact details of the person accountable for air quality and dust issues on the site boundary (i.e. the environment manager/engineer or site manager);
- display the head or regional office contact information on the site boundary;
- record all dust and air quality complaints, identify cause, take appropriate measures to reduce emissions in a timely manner and record the measures taken;
- make the complaints log available to the local authority when asked;
- record any exceptional incidents that cause dust and/or air emissions, either on- or off- site and the action taken to resolve the situation in the log book;
- carry out regular site inspections to monitor compliance with the DMP, record inspection results and make inspection log available to LBC when asked;
- Undertake daily on-site and off-site inspections, where receptors are nearby, to monitor dust, record inspection results and make the log available for the LA when asked. This will be particularly important for Listed Buildings in the vicinity of the ISS site;
- increase frequency of site inspection by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged periods of dry or windy conditions;
- 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;
- 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. If being re-used cover to prevent wind-whipping and reduce emissions;
- ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards where applicable;
- 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;
- only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction e.g. suitable local exhaust ventilation systems;
- ensure an adequate water supply on site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate;
- use enclosed chutes and 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;
- avoid bonfires and burning of waste materials;
- ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground;
- avoid explosive blasting, using appropriate manual or mechanical alternatives;
- bag and remove any biological debris or damp down such material before demolition;

- use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material tracked out of the site;
- avoid dry sweeping of large areas;
- ensure vehicles entering and leaving the site are covered to prevent the escape of materials during transport;
- inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as possible;
- record all inspections of haul routes and any subsequent action in a log book;
- use water-assisted dust sweepers on the access and local roads, to remove, as necessary, any material tracked out of the site;
- implement a wheel washing system, where possible (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable) – this will not be possible at the ISS site;