Air Quality Assessment

Premier Inn Hub, Brunswick Centre

June 2023

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Document Control:

Project no.	Project
12129.S	Premier Inn Hub, Brunswick Centre

Report No.	Ver/rev	Written By:	Checked by:	Authorised by:	Date
12129.S	V0 Draft	M. Batchelor	J. Ferguson-Moore	J. Ferguson-Moore	23/05/2023
	V1				14/06/2023

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1. Introduction

Background

1.1 Phlorum Limited has been commissioned by Lazari Investments Limited to undertake an Air Quality Assessment (AQA) for a proposed subterranean hotel, located beneath The Brunswick Centre, Bloomsbury, within the administrative boundary of the London Borough of Camden (LBC). The National Grid Reference for the centre of the site is 530259, 182268. The site location is included in Figure 1.

1.2 It is understood that the proposal comprises the introduction of a subterranean hotel at lower ground floor level at the Brunswick Centre, with an ancillary entrance lobby located at ground floor level. The proposed hotel will provide a total of 207 bedrooms, and an ancillary F&B restaurant. Associated plant and PV panels will be located either at roof level or lower ground floor level, with associated cabling feeding through existing risers where possible.

1.3 Land use in the vicinity of the application site is primarily residential and commercial (at the Brunswick Centre itself and the streets surrounding it), with Brunswick Square located directly to the east.

1.4 The main sources of air pollution in the vicinity of the application site are vehicles travelling on the local road network; specifically each of the four road links that surround the Brunswick Centre. These are, namely, the B502 Bernard Street, Marchmont Street, Handel Street, and the B504 Brunswick Square.

1.5 The development site lies within LBC's borough-wide Air Quality Management Area (AQMA). LBC declared this AQMA in 2002, due to exceedances of the annual mean Air Quality Standard (AQS) for nitrogen dioxide (NO_2) and the 24-hour mean AQS for particulate matter (PM_{10}).

Scope of Assessment

1.6 The focus of this report will be to assess the suitability of the site, in air quality terms, for the introduction of new, sensitive receptors into an area of poor air quality. Further assessment of the potential for the proposed development, once operational, to impact local air quality is also presented.

1.7 The report will also assess the potential for dust-related impacts during the construction phase and provide an Air Quality Neutral Assessment.

2. Policy Context

The UK Air Quality Strategy

2.1 The UK Air Quality Strategy (UKAQS)[1] sets out air quality standard (AQS) concentrations for a number of key pollutants that are to be achieved at sensitive receptor locations across the UK by corresponding air quality objective (AQO) dates. The sensitive locations at which the standards and objectives apply are those where the population are reasonably expected to be exposed to said pollutants over the particular averaging period.

2.2 For those objectives to which an annual mean standard applies, the most common sensitive receptor locations used to compare concentrations against the standards are areas of residential housing. It is reasonable to expect that people living in their homes could be exposed to pollutants over such a period of time.

2.3 Schools and children's playgrounds are also often used as sensitive locations for comparison with annual mean objectives due to the increased sensitivity of young people to the effects of pollution (regardless of whether or not their exposure to the pollution could be over an annual period). For shorter averaging periods of between 15 minutes, 1 hour or 1 day, the sensitive receptor location can be anywhere where the public could be exposed to the pollutant over these shorter periods of time. A summary of the AQS relevant to this assessment are included in Table 2.1, below.

Table 2.1: UK Air Quality Standards and Objectives.

Pollutant	Averaging Period	Air Quality Standard (µg.m^{-3})	Air Quality Objective
Nitrogen dioxide (NO_2)	1 hour	200	200 µg.m^{-3} not to be exceeded more than 18 times a year
	Annual	40	40 µg.m^{-3}
Particulate Matter (PM_{10})	24 hour	50	50 µg.m^{-3} not to be exceeded more than 35 times a year
	Annual	40	40 µg.m^{-3}
Particulate Matter ($PM_{2.5}$)	Annual	20	20 µg.m^{-3}

1 Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2) July 2007.

2.4 The objectives adopted in the UK are based on the Air Quality (England) Regulations 2000[2], as amended, for the purpose of Local Air Quality Management.. These Air Quality Regulations have been adopted into UK law from the limit values required by European Union Daughter Directives on air quality.

2.5 The UKAQS for $PM_{2.5}$ was amended as part of the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[3].

London Local Air Quality Management

2.6 The London *Local Air Quality Management* (LLAQM) framework is the statutory process used by London authorities to review and improve air quality within their administrative boundaries. This framework was designed to specifically meet London's needs.

2.7 The LLAQM framework provides London-specific policy and technical guidance (LLAQM.PG(19)[4] and LLAQM.TG(19)[5]) for the London boroughs. Although both are largely based on the updated national Defra LAQM guidance, they incorporate London-specific elements of the LAQM system.

2.8 Obligations under the Environment Act 1995 require local authorities to declare an AQMA at sensitive receptor locations where an objective concentration has been predicted to be exceeded. In setting an AQMA, the local authority must then formulate an Air Quality Action Plan (AQAP) to seek to reduce pollution concentrations to values below the objective levels. LBC have declared one borough-wide Air Quality Management Area (AQMA); declared in 2002 due to exceedances of the annual mean Air Quality Standard (AQS) for nitrogen dioxide (NO_2) and the 24-hour mean AQS for particulate matter (PM_{10}).

2.9 LBC have drafted the *Camden Clean Air Strategy 2019-2034* and the *Camden Clean Air Action Plan 2022-2026*[6], which outlines the actions and strategies being undertaken to reduce pollution concentrations across the borough. These measures include the incentivising of cleaner forms of transport and reducing emissions from development and buildings.

2.10 The Greater London Authority (GLA) has designated six Air Quality Focus Areas (AQFAs) in the LBC area. An AQFA is a location that has been identified by the GLA as having both high levels of NO_2 and significant human exposure. The application site is situated 0.3km south of two adjoining AQFAs; namely the *Marylebone Road from Marble Arch/Euston/King's Cross Junction AQFA* and the *King's Cross/Caledonian Road AQFA*.

2 The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.
3 The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020.
4 Mayor of London. (2019). *London Local Air Quality Management (LLAQM) Framework Policy Guidance (2019)*.
5 Mayor of London. (2019). *London Local Air Quality Management (LLAQM) Framework Technical Guidance (2019)*.
6 London Borough of Camden. (2022). *Camden Clean Air Strategy 2019-2034 and Camden Clean Air Action Plan 2022-2026*.

2.11 The Mayor of London is developing the London Clean Air Action Plan. As part of this process, in addition to the existing Low Emission Zone (LEZ), the central London Ultra-Low Emission Zone (ULEZ) was introduced on 8th of April 2019, which replaces previous interim policy interventions to tackle air pollution, such as the London Emissions Surcharge (T-charge)[7].

2.12 The site is within the existing London LEZ[8]. In October 2020, LEZ standards tightened. Emissions standards, daily charges and penalties changed for lorries, buses, coaches, and other specialist vehicles over 3.5 tonnes operating within the LEZ.

2.13 The site is also within the boundary of the ULEZ, which was extended in October 2021 to create a single larger zone bounded by the North and South Circular Roads.

National Planning Policy Framework

2.14 The *National Planning Policy Framework* (NPPF)[9], which was updated in July 2021, sets out the Government's planning policy for England. At its heart is an intention to promote more sustainable development. A core principle in the NPPF that relates to air quality effects from development is that planning should "contribute to conserve and enhance the natural and local environment". In achieving this, it states in paragraph 174 that:

"Planning policies and decisions should contribute to and enhance the natural and local environment by: […]

preventing new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability […]".

2.15 With regard to assessing cumulative effects the NPPF states the following at paragraph 185:

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

2.16 Regarding compliance with relevant limit values and national objectives for pollutants the NPPF, paragraph 186 states:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the

7 Transport for London. (2023). *Central London Ultra Low Emission Zone*.
8 Transport for London. (2023). *London Low Emission Zone*.
9 Department for Communities and Local Government (DCLG). (2021). *National Planning Policy Framework*.

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."

2.17 The NPPF offers a broad framework but does not afford a detailed methodology for assessments. Specific guidance for air quality continues to be provided by organisations such as the Department for Environment, Food and Rural Affairs (Defra), Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM).

National Planning Practice Guidance

2.18 Reference ID 32 (Air Quality) of the National Planning Practice Guidance (PPG)[10], which was updated in November 2019, provides guiding principles on how planning can take account of the impact of new development on air quality. The PPG summarises the importance of air quality in planning and the key legislation relating to it.

2.19 As well as describing the importance of International, National and Local Policies (detailed elsewhere in this report), it summarises the key sources of air quality information. It also explains when air quality is likely to be relevant to a planning decision, stating:

"Considerations that may be relevant to determining a planning application include whether the development would:

- *Lead to changes (including any potential reductions) in vehicle-related emissions in the immediate vicinity of the proposed development or further afield. This could be through the provision of electric vehicle charging infrastructure; altering the level of traffic congestion; significantly changing traffic volumes, vehicle speeds or both; or significantly altering the traffic composition on local roads. Other matters to consider include whether the proposal involves the development of a bus station, coach or lorry park; could add to turnover in a large car park; or involve construction sites that would generate large Heavy Goods Vehicle flows over a period of a year or more;*

- *Introduce new point sources of air pollution. This could include furnaces which require prior notification to local authorities; biomass boilers or biomass-fuelled Combined Heat and Power plant; centralised boilers or plant burning other fuels within or close to an air quality management area or introduce*

10 Planning Practice Guidance (PPG) 32. (Updated July 2021). *Air Quality*.

relevant combustion within a Smoke Control Area; or extraction systems (including chimneys) which require approval or permits under pollution control legislation;

- *Expose people to harmful concentrations of air pollutants, including dust. This could be by building new homes, schools, workplaces or other development in places with poor air quality;*
- *Give rise to potentially unacceptable impacts (such as dust) during construction for nearby sensitive locations;*
- *Have a potential adverse effect on biodiversity, especially where it would affect sites designated for their biodiversity value."*

2.20 Details are also provided of what should be included within an air quality assessment. Key considerations include:

- Baseline local air quality;
- Whether the proposed development could significantly affect local air quality during construction/operation; and
- Whether the development is likely to expose more people to poor air quality.

2.21 Examples of potential air quality mitigation measures are also provided in the PPG.

London Specific Planning Policy

2.22 The Mayor's Air Quality Strategy to tackle air quality across London as a whole was published in 2010. This was replaced by the Mayor's Environment Strategy in 2018, and is supported by the new London Plan[11], which was published in 2021.

2.23 Policy SI1 '*Improving Air Quality*', of the new London Plan, states that:

"A) Development Plans, through relevant strategic, site-specific and area based policies, 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

11 Greater London Authority. (2021). *The London Plan*.

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 in 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

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 will 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."

London Low Emissions Zone for Non Road Mobile Machinery

2.24 London has introduced the Central Activity Zone (CAZ) for Non-Road Mobile Machinery (NRMM) to reduce emissions from construction site machinery in key areas of London; namely areas that contain seats of national governance, as well as nationally significant cultural and business locations. In addition to this, Opportunity Areas (OAs) were designated as geographic areas within the wider Borough network that have the potential for future infrastructural and residential development.

2.25 The NRMM CAZ was introduced as current estimates of emissions from NRMM used on construction sites were shown to be responsible for 7% of NO_X emissions, 14% of $PM_{2.5}$ emissions and 8% of PM_{10} emissions across the Capital.

2.26 The site is located within the CAZ and is therefore bound by the emission requirements of the current NRMM policy for the CAZ and OAs.

2.27 Therefore, any NRMM operating on site during the construction of the proposed development should meet emissions Stage IV of EU Directive 97/68/EC as a minimum. Furthermore, all constant speed engines such as those typically found in generators will be required to meet Stage V.

2.28 Efforts should be made to avoid the use of diesel or petrol-powered generators and mains electricity or battery powered equipment should be used where possible.

Local Planning Policy

2.29 LBC have adopted a number of planning documents that combine to form the development plan for Camden. The *Camden Local Plan*[12], adopted in July 2017, is LBC's key document in Camden's development plan. The Local Plan sets out a vision for the borough and implements policies to steer development in the borough towards this vision.

2.30 The *Camden Local Plan* details a number of policies with relevance to air quality, including:

Policy A1: *Managing the Impact of Development*:

"The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity.

We will:

12 London Borough of Camden. (2017). *Camden Local Plan*.

a. *seek to ensure that the amenity of communities, occupiers and neighbours is protected;*

b. *seek to ensure development contributes towards strong and successful communities by balancing the needs of development with the needs and characteristics of local areas and communities;*

c. *resist development that fails to adequately assess and address transport impacts affecting communities, occupiers, neighbours and the existing transport network; and*

d. *require mitigation measures where necessary.*

The factors we will consider include: […]

h. *transport impacts, including the use of Transport Assessments, Travel Plans and Delivery and Servicing Management Plans;*

i. *impacts of the construction phase, including the use of Construction Management Plans;*

k. *odour, fumes and dust; […]".*

Policy CC4: *Air Quality*:

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

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

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

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

Policy A3: *Biodiversity*:

"[…] require the demolition and construction phase of development, including the movement of works vehicles, to be planned to avoid disturbance to habitats and species and ecologically sensitive areas, and the spread of invasive species".

2.31 Other Local Plan policies of relevance to air quality include policies '*CC1: Climate Change Mitigation*', '*CC2: Adapting to Climate Change*', and policies T1 to T4 which guide transportation in the borough.

2.32 LBC's Camden Planning Guidance (CPG) on *Air Quality*[13] was published in January 2021 with the intention to support policies detailed in the Local Plan, and in particular policy '*CC4: Air Quality*'. The document provides guidance on the Council's requirements for an AQA.

13 London Borough of Camden. (2021). *Camden Planning Guidance Air Quality*.

3. Baseline Air Quality

3.1 This chapter is intended to establish prevailing air quality conditions in the vicinity of the application site. Baseline air quality conditions in the vicinity of the site are established through the compilation and review of appropriately sourced background concentration estimates and local monitoring data.

3.2 Defra provides estimated background concentrations of the UKAQS pollutants at the UK Air Information Resource (UK-AIR) website[14]. These estimates are produced using detailed modelling tools and are presented as concentrations at central 1km^2 National Grid square locations across the UK. At the time of writing, the most recent background maps were from August 2020 and based on monitoring data from 2018.

3.3 Being background concentrations, the UK-AIR data are intended to represent a homogenous mixture of all emissions sources within the general area of a particular grid square location. Concentrations of pollutants at various sensitive receptor locations can, therefore, be calculated by modelling the emissions from a nearby pollution source, such as a busy road, and then adding this to the appropriate UK-AIR background datum.

3.4 The London Atmospheric Emissions Inventory (LAEI)[15] provides modelled ground level concentrations of key pollutants at 20m grid resolution across Inner and Greater London. LAEI estimates of NO_2, PM_{10} and $PM_{2.5}$ concentrations are included for 2019 at the application site.

3.5 Monitoring at roadside and background locations is also considered an appropriate source of data for the purposes of describing baseline air quality. LBC automatic and non-automatic monitoring data were reviewed to establish baseline air quality. The most recent available data at the time of writing, from LBC's 2021 *Annual Status Report* (ASR)[16], have been included and assessed.

UK-AIR Background Pollution

3.6 UK-AIR predicted background pollution concentrations for NO_2, PM_{10} and $PM_{2.5}$ for 2019 to 2024 are presented in Table 3.1, below. These data were taken from the central grid square location closest to the application site (i.e. grid reference: 530500, 182500).

14 Defra. (2023). *UK-AIR*.
15 Greater London Authority. (2019). *London Atmospheric Emission Inventory (LAEI) 2019*.
16 London Borough of Camden. (2022). *London Borough of Camden's 2021 Air Quality Annual Status Report.*

Table 3.1: 2019 to 2024 Background Concentrations of Pollutants at the Application Site.

Pollutant	Predicted Background Concentration ($\mu g.m^{-3}$)						Averaging Period	Air Quality Standard Concentration ($\mu g.m^{-3}$)
	2019	2020	2021	2022	2023	2024		
NO_2	39.3	37.3	36.4	35.5	34.8	34.1	annual mean	40
PM_{10}	20.3	19.7	19.5	19.3	19.1	18.8	annual mean	40
$PM_{2.5}$	12.9	12.6	12.4	12.2	12.1	11.9	annual mean	20

3.7 The data in Table 3.1 show that annual mean background concentrations of NO_2, PM_{10} and $PM_{2.5}$, in the vicinity of the application site, between 2019 and 2024, are predicted to be below their respective AQSs. The data show that in 2023, NO_2, PM_{10} and $PM_{2.5}$ concentrations are predicted to be below their AQSs by 13%, 52% and 40%, respectively. As such, annual mean background pollutant concentrations are likely to be below their respective AQSs at the application site.

3.8 Concentrations of all pollutants are predicted to decline each year. These reductions are principally due to the forecast effect of the roll out of cleaner vehicles, but also due to London, UK national and international plans to reduce emissions across all sectors.

London Atmospheric Emissions Inventory (LAEI)

3.9 LAEI modelled annual mean pollution concentrations of NO_2, PM_{10} and $PM_{2.5}$ for 2019 are presented in Table 3.2, below. These data were taken from the following 20m grid squares:

- **530260,182280** = The closest 20m grid square to the centre point of the Brunswick Centre;
- **530180,182340** = The closest 20m grid square to the north-west boundary of the application site, at the junction of Marchmont Street and Handel Street; and
- **530280,182380** = The closest 20m grid square to the north-east boundary of the application site, at the junction of Handel Street and the B504 Brunswick Square;
- **530340,182200** = The closest 20m grid square to the south-east boundary of the application site, at the junction of the B504 Brunswick Square and the B502 Bernard Street;
- **530240,182160** = The closest 20m grid square to the south-west boundary of the application site, at the junction of the B504 Brunswick Square and B502 Bernard Street; and

- **530280,182200** = The closest 20m grid square to the location of the existing underground car park's work shafts; which will act as the designated fresh air intake for the development.

Table 3.2: LAEI Modelled Concentrations for 2019

LAEI Grid Square	Pollutant	Modelled Concentration ($\mu g.m^{-3}$)	Averaging Period	Air quality standard concentration ($\mu g.m^{-3}$)
		2019		
530260,182280 (Centre of Brunswick Centre)	NO_2	37.2	Annual Mean	40
	PM_{10}	21.0	Annual Mean	40
	$PM_{2.5}$	13.0	Annual Mean	20
530180,182340 (NW Boundary)	NO_2	37.2	Annual Mean	40
	PM_{10}	20.9	Annual Mean	40
	$PM_{2.5}$	12.9	Annual Mean	20
530280,182380 (NE Boundary)	NO_2	38.6	Annual Mean	40
	PM_{10}	21.4	Annual Mean	40
	$PM_{2.5}$	13.0	Annual Mean	20
530340,182200 (SE Boundary)	NO_2	41.7	Annual Mean	40
	PM_{10}	22.4	Annual Mean	40
	$PM_{2.5}$	13.5	Annual Mean	20
530240,182160 (SW Boundary)	NO_2	42.0	Annual Mean	40
	PM_{10}	22.6	Annual Mean	40
	$PM_{2.5}$	13.6	Annual Mean	20
530280,182200 (Air Intake)	NO_2	38.0	Annual Mean	40
	PM_{10}	21.3	Annual Mean	40
	$PM_{2.5}$	13.1	Annual Mean	20

3.10 The data in Table 3.2 show that modelled annual mean concentrations of NO_2 in 2019, surrounding the Brunswick Centre are, in some locations, in exceedance of the 40.0 $\mu g.m^{-3}$ AQS. Exceedances of the AQS were recorded at the south-eastern and south-western boundaries of the existing shopping centre, adjacent to the junctions of the B502 Bernard Road with Marchmont Street and the B504 Brunswick Square. In these locations, NO_2 concentrations of 41.7 $\mu g.m^{-3}$ and 42.0 $\mu g.m^{-3}$ are estimated by the LAEI; equating to exceedances of the annual mean AQS by 4% and 5% respectively.

3.11 However, at the base of the proposed fresh air intake, which will utilise the existing basement work shafts and provide air to the proposed hotel, NO_2 concentrations are expected to be 38.0 µg.m^{-3}; 5% below the 40.0 µg.m^{-3} AQS. Given that these shafts are approximately 10m in height, baseline concentrations at the intake itself are likely to be further reduced in comparison to ground level concentrations; the result of greater pollutant dispersion with increasing height.

3.12 LAEI estimated annual mean concentrations of PM_{10} in 2019 are well below the long-term AQS at each location. With predicted concentrations ranging between 20.9 µg.m^{-3} and 22.6 µg.m^{-3}, it is expected that the annual mean AQS for PM_{10} is unlikely to be exceeded at the application site.

3.13 The LAEI estimates that annual mean $PM_{2.5}$ concentrations within the immediate vicinity of the application site range between 12.9 µg.m^{-3} and 13.6 µg.m^{-3} in 2019; 36% and 32% below the 20.0 µg.m^{-3} AQS for $PM_{2.5}$.

3.14 Considering the reduced grid square size in comparison to the UK-AIR dataset, and close proximity to the application site, the LAEI estimates are considered to be more representative of ground-level concentrations surrounding the application site.

Local Sources of Monitoring Data

3.15 Air quality monitoring is considered an appropriate source of data for the purposes of describing baseline air quality. At the time of writing, the most recent ASR[16] released by LBC included data from 2021. However, due to uncertainty regarding the impact of COVID-19 on traffic flows/emissions, due to numerous lockdown periods and increases in homeworking, this review of baseline air quality has focused on local pollutant monitoring data from 2019 (before COVID-19), despite more recent data being available.

Automatic Monitoring

3.16 LBC currently undertake automatic (continuous) monitoring of NO_2 at two locations within approximately 1.0km of the application site. The most recent available data from these monitors are included in Table 3.3, below.

Table 3.3: NO_2 Monitoring Data from LBC's Automatic Monitors Within 1.0km of the Application Site (Long-term AQS)

Monitor	Type	Distance from the Application Site (km)	NO_2 Annual Mean Concentration (µg.m^{-3})			
			2018	2019	2020	2021
BL0	UB	0.2	36.0	32.0	28.0	27.0
CD9	R	0.4	**82.0**	**70.0**	**43.0**	**48.0**

Note: "R" = Roadside; "UB" = Urban Background. **Bold** denotes exceedance of the annual mean AQS. NO_2 annual means in excess of 60.0 µg.m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective, are shown in **bold and are underlined**.

3.17 The data in Table 3.3 show that annual mean NO_2 concentrations at both of the selected monitors reduced between 2018 and 2021, with the marked decline in 2020 likely due to the influence of Covid-19 on traffic flows/emissions. However, it must be noted that monitor CD9 did record a relative increase in concentrations between 2020 and 2021.

3.18 The closest automatic monitor to the application site, BL0, is located in an urban background setting within the centre of Russell Square Gardens, approximately 0.2km to the south-west of the Brunswick Centre. In 2019, this monitor recorded an annual mean NO_2 concentration of 32.0 µg.m^{-3}; 20% below the annual mean AQS.

3.19 The highest annual mean NO_2 concentration was recorded at monitor CD9, located roadside to the A501 Euston Road. Located approximately 0.4km north-west of the application site, this monitor recorded an annual mean concentration of 70.0 µg.m^{-3} in 2019; above the annual mean AQS by 75%.

Table 3.4: NO_2 Monitoring Data from LBC's Automatic Monitors Within 1.0km of the Application Site (Short-term AQS)

Monitor	Type	Distance from the Application Site (km)	Number of Short-term NO_2 Exceedances			
			2018	2019	2020	2021
BL0	UB	0.2	0	0	0	0
CD9	R	0.4	18	7	0	1

Note: Results are presented as the number of 1-hour periods where concentrations greater than 200.0 µg.m^{-3} have been recorded. Exceedance of the NO2 short-term AQS of 200.0 µg.m^{-3} over the permitted 18 hours per year are shown in bold.

3.20 Table 3.4 (above) shows that, between 2018 and 2021, monitor BL0 did not record any 1-hour periods where concentrations exceeded 200.0 µg.m^{-3}.

3.21 In contrast, monitor CD9 record numerous exceedances of the respective short-term AQS (200.0 µg.m^{-3}) between 2018 and 2021. Notably, 18 exceedances of this threshold were recorded in 2018 alone. Despite this, the number of exceedances has substantially decreased over the course of the monitoring period; for instance, in 2021, one exceedance of the respective AQS was recorded at monitor CD9.

3.22 The notable reductions in exceedances of the 200.0 µg.m^{-3} threshold recorded at CD9 are likely due to the implementation of the ULEZ within Central London (April 2019), as well as the onset of the COVID-19 pandemic and its associated impact on traffic flows between 2020 and 2021.

3.23 LBC undertakes automatic (continuous) monitoring of PM_{10} at three locations . The most recent available data from these monitors is included in Table 3.5, below.

Table 3.5: PM_{10} Monitoring Data from LBC's Automatic Monitors Within 1.0km of the Application Site (Long-term AQS)

Monitor	Type	Distance from the Application Site (km)	PM_{10} Annual Mean Concentration ($\mu g.m^{-3}$)			
			2018	2019	2020	2021
BL0	UB	0.2	17.0	18.0	16.0	16.0
CD9	R	0.4	21.0	22.0	18.0	19.0
KGX	UB/I	1.0	15.0	15.0	13.0	13.0

Note: "I" = Industrial; "R" = Roadside; "UB" = Urban Background

3.24 The data in Table 3.5 show that annual mean PM_{10} concentrations were consistently below the 40.0 $\mu g.m^{-3}$ AQS between 2018 and 2021 at all three monitoring stations.

3.25 The closest monitor to the application site, BL0, recorded an annual mean PM_{10} concentration of 18.0 $\mu g.m^{-3}$ in 2019; below the 40.0 $\mu g.m^{-3}$ AQS by 55%.

3.26 In contrast, the highest recorded annual mean concentration of PM_{10} was recorded at monitor CD9; adjacent to the A501 Euston Road. In 2019, this monitor recorded an annual mean concentration of 22.0 $\mu g.m^{-3}$; 45% below the annual mean AQS.

Table 3.6: PM_{10} Monitoring Data from LBC's Automatic Monitors Within 1.0km of the Application Site (Short-term AQS)

Monitor	Type	Distance from the Application Site (km)	Number of Short-term PM_{10} Exceedances			
			2018	2019	2020	2021
BL0	UB	0.2	1	9	4	0
CD9	R	0.4	2	8	2	2
KGX	UB/I	1.0	1	5	1	0

Note: Exceedances of the PM10 24-hour mean objective (50 $\mu g.m^{-3}$ over the permitted 35 days per year) are shown in bold.

3.27 Between 2018 and 2021, monitor BL0 recorded the highest number of exceedances of the respective short-term AQS of 50.0 µg.m^{-3} for PM_{10}. In 2019, 9 24-hour mean exceedances of this threshold were recorded at this monitor; the highest total within a single year at each of the four monitors. This, however, remains well below respective AQS (35 exceedances annually).

3.28 LBC undertakes automatic (continuous) monitoring of $PM_{2.5}$ at two locations within 1.0km of the Application Site. The most recent available data from these monitors is included in Table 3.7, below.

Table 3.7: $PM_{2.5}$ Monitoring Data from LBC's Automatic Monitors Within 1.0km of the Application Site (Long-term AQS)

Monitor	Type	Distance from the Application Site (km)	PM_{10} Annual Mean Concentration (µg.m^{-3})			
			2018	2019	2020	2021
BL0	UB	0.2	10.0	11.0	9.0	9.0
CD9	R	0.4	15.0	14.0	11.0	11.0

Note: "R" = Roadside; "UB" = Urban Background

3.29 The data in Table 3.7 show that annual mean $PM_{2.5}$ concentrations were consistently below the 20.0 µg.m^{-3} AQS between 2018 and 2021.

3.30 The closest monitor to the application site, BL0, recorded an annual mean $PM_{2.5}$ concentration of 11.0 µg.m^{-3} in 2019; below the 20.0 µg.m^{-3} AQS by 45%.

3.31 The highest recorded annual mean concentration of $PM_{2.5}$ was, once again, recorded at monitor CD9. In 2019, this monitor recorded an annual mean concentration of 14.0 µg.m^{-3}; 30% below the annual mean AQS.

Non-Automatic Monitoring

3.32 LBC also operate an extensive non-automatic, NO_2 diffusion tube monitoring network at strategic locations within the borough. The most recent available monitoring data for diffusion tubes located within 1.0km of the application site are included in Table 3.8, below.

Table 3.8: Monitoring data from LBC NO_2 Diffusion Tubes Within 1.0km of the Application Site

Monitor	Type	Distance from the Application Site (km)	NO_2 Annual Mean Concentration (µg.m^{-3})			
			2018	2019	2020	2021
CA6	UB	0.2	26.7	25.2	-	-
CA28	UB	0.3	-	28.3	22.5	17.4

Monitor	Type	Distance from the Application Site (km)	NO_2 Annual Mean Concentration ($\mu g.m^{-3}$)			
			2018	2019	2020	2021
CA10	UB	0.3	35.4	33.9	26.8	22.3
CA27	R	0.4	-	**65.3**	**46.6**	**46.8**
CA4A	K	0.5	-	**70.7**	**53.7**	**57.1**
CA29	R	0.5	-	**49.5**	35.3	34.5
CA21	K	0.6	**59.4**	**49.6**	29.5	33.2
CA11	K	0.8	**65.8**	**62.6**	**43.3**	**44.4**
CA20A	R	0.8	**-**	**44.1**	**43.9**	34.5

Note: "K" = Kerbside; "R" = Roadside; "UB" = Urban Background. **Bold** denotes exceedance of the AQS. NO_2 annual means in excess of 60.0 $\mu g.m^{-3}$, indicating a potential exceedance of the NO_2 hourly mean AQS objective, are shown in **bold and underlined**.

3.33 The data in Table 3.8 show that annual mean NO_2 concentrations recorded at diffusion tubes within 1.0km of the application site exceeded the long-term AQS (40.0 $\mu g.m^{-3}$) at six locations and 60.0 $\mu g.m^{-3}$, indicative of potential short-term (hourly) AQS NO_2 exceedances, at three locations between 2018 and 2021. Each exceedance of both the long-term AQS and 60.0 $\mu g.m^{-3}$ indicative threshold was recorded at roadside and kerbside monitors. Despite this, each of the selected monitors within 1.0km of the application site recorded an overall decline in annual mean NO_2 concentrations between 2018 and 2021.

3.34 The closest diffusion tube to the application site, CA6, recorded an annual mean concentration of 25.2 $\mu g.m^{-3}$ in 2019; 58% below the indicative 60.0 $\mu g.m^{-3}$ threshold. Located in an urban background setting within St George's Gardens, this monitor is distanced approximately 0.2km from the application site.

3.35 The highest concentration in 2019 was recorded at diffusion tube CA4A; located adjacent to the junction of the A501 Euston Road and Judd Street, 0.5km to the north of the application site. In 2019, a concentration of 70.7 $\mu g.m^{-3}$ was recorded; 18%% above the indicative concentration of potential exceedance of the short-term AQS.

4. Assessment Methodology

Guidance

4.1 Defra's *Local Air Quality Management Technical Guidance* (LAQM.TG(22))[17] and London's *Local Air Quality Management Technical Guidance* (LLAQM.TG(19))[18] were followed in carrying out the assessment.

4.2 The latest Environmental Protection UK (EPUK) & Institute of Air Quality Management (IAQM) guidance on *'Planning for Air Quality'*[19] was also referred to throughout the assessment.

4.3 Guidance published by the IAQM on the *'Assessment of Dust from Demolition and Construction'*[20] was also used to assess the risk of dust emissions during the construction phase of the proposed development. The Greater London Authority's (GLA) *Supplementary Planning Guidance*[21] on the control of dust from construction has also been referred to, which is considered best practice guidance for the UK. It details a number of mitigation measures that should be adopted to minimise adverse impacts from dusts and fine particles.

4.4 Defra's *Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance*[22] was used within this assessment to establish the suitability of the site for the proposed hotel.

4.5 The GLA's recently published *Air Quality Neutral Guidance* (2023)[23] has been followed when undertaking the Air Quality Neutral Assessment for the proposed development.

Construction Phase

4.6 The construction phase of the proposed development will involve a number of activities that could potentially produce polluting emissions to air. Predominantly, these will be emissions of dust. However, they could also include releases of odours and/or more harmful gases and particles.

17 Defra. (2022). *Local Air Quality Management Technical Guidance* (LAQM.TG(22)).
18 Mayor of London. (2019). *London Local Air Quality Management Technical Guidance* (LLAQM. TG(19)).
19 EPUK & IAQM. (2017). *Land-Use Planning & Development Control: Planning For Air Quality*.
20 IAQM. (2014). *Guidance on the Assessment of Dust from Demolition and Construction*.
19 Greater London Authority. (2014). *The Control of Dust and Emissions During Construction and Demolition*.
22 AEA Energy and Environment. (2008). *Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guide for Laboratories and Users.*
23 Greater London Authority. (2023). *Air Quality Neutral Guidance*.

4.7 The IAQM's guidance to assess the impacts of construction on human and ecological receptors has been followed in carrying out this air quality assessment. The guidance suggests that where a receptor is located within 350m (50m for statutory ecological receptors) of a site boundary and/or 50m of a route used by construction vehicles, up to 500m from the site entrance, a dust assessment should be undertaken. High sensitivity receptors are considered particularly sensitive when located within 20m of a works area.

4.8 The Multi Agency Geographic Information for the Countryside (MAGIC) website[24], which incorporates Natural England's interactive maps, has been reviewed to identify whether any statutory ecological sensitive receptors are situated within 50m of the site boundary or within 50m of any routes used by construction vehicles on the public highway, up to 500m from the site entrance.

Construction Significance

4.9 The IAQM guidance suggests that Demolition, Earthworks, Construction and Trackout should all be assessed individually to determine the overall significance of the construction phase.

4.10 In the IAQM dust guidance, the first step in assessing the risk of impacts is to define the potential dust emission magnitude. This can be considered 'Negligible', 'Small', 'Medium' or 'Large' for each of the construction stages. Whilst the IAQM provides examples of criteria that may be used to assess these magnitudes, the vast number of potential variables mean that every site is different and therefore professional judgement must be applied by what the IAQM refer to as a "technically competent assessor". The construction phase assessment therefore relies on the experience of the appraiser.

4.11 As such, attempts to define precisely what constitutes a negligible, small, medium or large dust emission magnitude should be treated with caution. Factors such as the scale of the work, both in terms of size and time, the construction materials and the plant to be used must be considered.

4.12 The second step is to define the sensitivity of the area around the construction site. As stated in the IAQM guidance:

"the sensitivity of the area takes into account a number of factors:

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

24 Natural England and MAGIC partnership organisations. *Multi Agency Geographic Information for the Countryside*. [Accessed March 2023].

4.13 Based on these factors, the area is categorised as being of 'Low', 'Medium' or 'High' sensitivity.

4.14 When dust emission magnitudes for each stage and the sensitivity of the area have been defined, the risk of dust impacts can be determined. The IAQM provides a risk of impacts matrix for each construction stage. The overall significance for the construction phase can then be judged from the stages assessed. Again, this is subject to professional judgement.

4.15 Combustion exhaust gases from diesel-powered plant and construction vehicles accessing the site will also be released. However, the volumes and periods over which these releases will occur are unlikely to result in long-term impacts on local air quality and therefore this has been scoped out of the assessment.

Operational Phase

Road Transport Sources

4.16 Vehicle emissions will arise from the combustion of fossil fuels in vehicle engines and their subsequent release to atmosphere via tailpipe exhausts. The most significant pollutants released by cars and other vehicles are oxides of nitrogen (NO_2/NO_x) and particulate matter (PM_{10} and $PM_{2.5}$). Releases of carbon monoxide (CO) and some volatile hydrocarbons (e.g. benzene and 1,3-butadiene) are of less significance and are not assessed further in this report.

4.17 As it is elevated annual mean concentrations of NO_2 and PM_{10} that have resulted in the declaration of most AQMAs across the UK, these are the pollutants of most concern and they have therefore been the focus of this air quality assessment. $PM_{2.5}$, which is another fraction of particulate matter, has also been considered.

4.18 The latest EPUK & IAQM planning guidance[19] provides indicative thresholds for changes in traffic flows which would require a detailed, dispersion modelling air quality assessment. These are a change in 24-hour annual average daily traffic flows exceeding 100 light-duty vehicles (LDVs) and/or 25 heavy-duty vehicles (HDVs) within an AQMA.

4.19 Full justification behind the screening assessment of air quality related impacts on existing receptors in the local area has been provided in Section 6 of this report.

Air Quality Neutral Assessment

4.20 For some time, the standard approach for air quality assessments was to predict the change in pollution concentrations through the use of a screening or detailed dispersion model and, where the potential for a significant impact was identified, recommend mitigation measures so that the significance of effect can be kept to an acceptable level. However, this type of assessment does little to consider the overall emissions from a development and its contribution to broader background concentrations, which can gradually increase due to incremental changes from successive developments, particularly in a large city such as London.

4.21 As a result of these effects, an air quality neutral policy was included in the London Plan. It aims to ensure that developments are air quality neutral or better, particularly in areas where any AQSs are being breached.

4.22 Following multiple updates and changing of methodologies, the GLA's recently published Air Quality Neutral Guidance (2023)[23] has been followed when undertaking the Air Quality Neutral Assessment for the proposed development.

4.23 An Air Quality Neutral Assessment has been undertaken and is presented in Section 7 of this report. The development is also assessed against the guidance provided by the GLA.

Consultation

4.24 LBC's Air Quality Officer was contacted on the 24th of March 2023 to discuss and agree the proposed scope of the assessment. A response was received on the 27th of April 2023, agreeing to the scope of the assessment, provided certain conditions were met regarding the operation of the Hotel's proposed emergency generator.

4.25 It was further confirmed by LBC that internal filtration of both NO_X and PM was not required, given that concentrations of each pollutant, at the location of the fresh air intake, were expected to be below the respective AQS'. Furthermore, the provision of internal filtration would cause an additional burden on the proposed development's energy centre; which itself could be detrimental to local air quality.

5. Construction Phase

5.1 The construction phase of the proposed development will involve a number of activities that could produce polluting emissions to air. Predominantly, these will be emissions of dust.

5.2 The estimates for the dust emission magnitude for demolition, earthworks, construction and trackout below are based on the professional experience of Phlorum's consultants, information provided by the client and Google Earth imagery.

Dust Emission Magnitude

Demolition

5.3 Demolition of the existing underground car park is not required for the proposed development and is therefore not considered further within this assessment. Given the heritage status of the wider Brunswick Centre, the existing car park's floors will be cut into sections and lowered, thus retaining the concrete columns, and providing lateral support for the wider structure.

Earthworks

5.4 No earthworks are planned, and therefore, this stage is not considered further within this assessment.

5.5 It is currently unknown whether the site is contaminated. If the site is contaminated to some extent, the potential health effects from the release of contaminated dusts are not considered by this report, and should be dealt with by a separate, specialist assessment, if required.

Construction

5.6 During construction, activities that have the potential to cause emissions of dust may include the lowering of the existing concrete slab, with additional infill concrete. Localised use of cement powder and general handling of construction materials also have the potential to generate dust emissions. It should be noted however that the proposed construction works will be undertaken internally, minimising wider impacts on local air quality.

5.7 The total construction volume of the proposed development is unknown.

5.8 Given the scale of the overall development, and for conservative purposes, the dust emission magnitude during construction is considered to be *Medium* with reference to the IAQM guidance.

Trackout

5.9 Construction traffic, when travelling over soiled road surfaces, has the potential to generate dust emissions and to also add soil to the local road network. During dry weather, soiled roads can lead to dust being emitted due to physical and turbulent effects of vehicles.

5.10 No unpaved roads will be utilised by construction vehicles, with the existing Car Park Access Road proposed as the primary site access. It is anticipated that between 10-50 HDVs will access the site per day. Based on the predicted number of HDVs accessing the site per day, the overall dust emission magnitude for the trackout phase is considered to be *Medium* with reference to the IAQM guidance.

Emission Magnitude Summary

5.11 A summary of the dust emission magnitude as a result of the activities of the Construction and Trackout phases as specified in the IAQM and GLA guidance, and discussed above, are listed in Table 5.1 below.

Table 5.1: Dust Emission Magnitude for the Construction Activities, Based on the IAQM's Guidance.

Activity	Dust Emission Magnitude
Construction	Medium
Trackout	Medium

Sensitivity of the Area

5.12 Having established the emission magnitudes for each phase above, the sensitivity of the area must be considered to establish the significance of effects. The effect of dust emissions depends on the sensitivity of each receptor.

5.13 High sensitivity human receptors include residential dwellings, schools and hospitals, but can include locations such as car showrooms when considering the impacts of dust soiling. Medium sensitivity receptors include locations where individuals would be expected to enjoy a reasonable level of amenity, but not the same level as would be expected in their homes, such as workplaces and parks.

5.14 The impacts of dust emissions from the sources discussed above have the potential to cause an annoyance to human receptors living in the local area. Within distances of 20m of the site boundary there is a high risk of dust impacts, regardless of the prevailing wind direction. Up to 100m from the construction site, there may still be a high risk, particularly if the receptor is downwind of the dust source.

5.15 With the exponential decline in dust concentrations with distance from dust generating activities, it is considered that for receptors more than 350m from the site boundary, the risk is negligible. Furthermore, the risks at over 100m only have the potential to be significant in certain weather conditions, e.g. downwind of the source during dry periods.

5.16 There are over 100 highly sensitive receptors in close proximity of the application site, specifically residential dwellings within 20m of the application site boundary. Therefore, following IAQM guidance, the sensitivity of the area to dust soiling impacts is defined as *High.*

5.17 UK-AIR and LAEI annual mean concentrations of PM_{10} are predicted to be below 24.0 $\mu g.m^{-3}$ at the site[25]. Additionally, monitored PM_{10} concentrations at each of LBC's three automatic monitors within 1km of the application site all recorded concentrations below 24.0 $\mu g.m^{-3}$ in 2019. However, given that there are over 100 residential receptors within 20m of the application site boundary, with reference to the respective IAQM guidance[20], the sensitivity of the area to human health impacts should be defined as *Medium*.

5.18 The Multi Agency Geographic Information for the Countryside (MAGIC) website[24] has been reviewed to identify whether any statutory ecological sensitive receptors are situated within 50m of the site boundary or within 50m of any routes used by construction vehicles on the public highway, up to 500m from the site entrance. The closest statutory site, Camley Street Nature Park (Local Nature Reserve), is located approximately 1.0km to the north of the application site. Therefore, based on distance alone, dust impacts to statutory ecological receptors can be screened out.

Risk of Impacts

5.19 Having established the potential dust emission magnitudes and sensitivity of the area, the risk of impacts can be determined in accordance with the IAQM guidance. These are summarised in Table 5.2, below.

5.20 Although the proposed development is expected to constitute a *Medium* Dust Emission Magnitude for the Construction Phase, given that all subsequent activity will be conducted within the confined existing Underground Car Park, it is anticipated that construction dust poses a *Negligible Risk* on sensitive receptors at ground level.

25 The 24.0$\mu g.m^{-3}$ 'threshold' is taken from Table 3 of the IAQM's construction dust guidance. This threshold, along with the number of receptors, their sensitivity, and their distance from source (construction site), helps establish the sensitivity of an area in terms of potential human health impacts from exposure to PM_{10}. According to the guidance, baseline annual mean PM_{10} concentrations below 24.0$\mu g.m^{-3}$ indicate that the sensitivity of the area in terms of human health impacts is *Low* in all cases except when there are a large number (>100) of highly sensitive receptors within 20m of the construction site.

Table 5.2: Summary of Impact Risk by Construction Stage Based on the IAQM's Dust Guidance.

Stage	Impact Risk		
	Nuisance Dust	Ecology	PM_{10} Health Effects
Construction	Negligible Risk	Negligible Risk	Negligible Risk
Trackout	Medium Risk	Negligible Risk	Low Risk

5.21 Overall, the proposed development is considered to be of *Medium Risk* for nuisance dust soiling effects, *Low Risk* PM_{10} health effects and a *Negligible Risk* for ecological impacts, in the absence of mitigation.

Site Specific Mitigation

5.22 The GLA guidance[21] suggests a number of mitigation measures that should be adopted in order to minimise impacts from dusts and fine particles. Appropriate measures that could be included during construction of the proposed development include:

- ideally cutting, grinding and sawing should not be conducted on-site and pre-fabricated material and modules should be brought in where possible;
- where such work must take place, water suppression should be used to reduce the amount of dust generated;
- skips, chutes and conveyors should be completely covered and, if necessary, enclosed to ensure that dust does not escape;
- no burning of any materials should be permitted on site;
- any excess material should be reused or recycled on-site in accordance with appropriate legislation;
- developers should produce a waste or recycling plan;
- following earthworks, exposed areas and soil stockpiles should be re-vegetated to stabilise surfaces, or otherwise covered with hessian or mulches;
- stockpiles should be stored in enclosed or bunded containers or silos and kept damp where necessary;
- hard surfaces should be used for haul routes where possible;
- haul routes should be swept/washed regularly;
- vehicle wheels should be washed on leaving the site;
- all vehicles carrying dusty materials should be securely covered; and

- delivery areas, stockpiles and particularly dusty items of construction plant should be kept as far away from neighbouring properties as possible.

5.23 In addition, the IAQM lists recommended mitigation measures for *Low, Medium* and *High* dust impact risk sites. Given that, with the exception of nuisance dust associated with the Trackout phase, the risk of dust impacts is classified as *Negligible* to *Low Risk*, highly recommended mitigation measures for *Low Risk* sites are included in Appendix A of this report. Highly recommended mitigation measures for *Medium Risk* sites have been included in Appendix A for Trackout-specific activities only.

5.24 Where dust generation cannot be avoided in areas close to neighbouring properties, additional mitigation measures should be put in place, such as: windbreaks, sprinklers, and/or time/weather condition limits on the operation of some items of plant or the carrying out of activities that are likely to generate a particularly significant amount of dust.

Residual Effects

5.25 After the implementation of the mitigation measures listed above and in Appendix A, the significance of each phase of the construction programme will be reduced and the residual significance of impact for the construction phase is expected to be *Negligible*.

6. Operational Phase

Impacts of Generated Vehicular Trips

6.1 The latest EPUK & IAQM planning guidance[19] provides indicative thresholds for changes in traffic flows which would require a detailed air quality assessment, when in an AQMA. These are a change in 24-hour average annual daily traffic (AADT) flows of >100 light duty vehicles (LDV) and/or >25 heavy duty vehicles (HDV). Changes below these thresholds can be reasonably considered to have an insignificant impact on air quality.

6.2 Traffic data provided by the transport consultants for the project, RGP, show that the proposed development is expected to generate 26 two-way movements (AADT), of which 4 are HDVs (15% of total flows). Therefore, the proposed traffic generation is expected to remain well below the indicative EPUK & IAQM threshold, and the proposed development can be reasonably assumed to have an insignificant impact on local air quality with respect to traffic emissions.

Site Suitability

6.3 The primary sources of air pollution in the vicinity of the application site are motor vehicles travelling on the local road network, namely the four road links that border the entirety of the Brunswick Centre. These are Handel Street, the B504 Brunswick Square, the B502 Bernard Street and Marchmont Street.

6.4 When assessing the suitability of the site for the proposed end use, short-term pollutant concentrations of NO_2 and PM_{10} are considered to be most relevant in terms of the potential exposure of future hotel occupants; with reference to Defra's London-specific Technical Guidance[5].

6.5 60.0 $\mu g.m^{-3}$ (NO_2) and 50.0 $\mu g.m^{-3}$ (PM_{10}) are therefore considered to be an appropriate benchmark for this site suitability assessment, as concentrations above this threshold are an indication of potential exceedances of the short-term AQS' for both pollutants (Table 2.1).

6.6 Short-term AQSs largely apply when assessing the potential impact of air quality when in proximity to spaces in which members of the public would not be expected to spend more than a few hours a day; such as a hotel.

6.7 Air quality within Bloomsbury is particularly poor. The data presented in LBC's latest ASR[16] show that, between 2018 and 2021, recorded concentrations of NO_2 at some roadside locations within the borough were in exceedance of the threshold indicative of potential exceedances of the short-term (hourly) AQS for NO_2. For instance, at monitor CA27, located within a roadside setting adjacent to the Euston Road, an annual mean NO_2 concentration of 65.3 $\mu g.m^{-3}$ was recorded; 9% above the indicative short-term threshold.

6.8 The air intakes of the proposed hotel will utilise the existing work shafts within the existing Shopping Centre, distanced approximately 35m from the closest roadside pollutant contribution (B502 Bernard Street). Given the distance between the air intakes and the closest road, it is expected that pollutant concentrations at the air intakes are likely to be similar to those recorded at nearby *Urban Background* monitoring locations.

6.9 The highest annual mean NO_2 concentration recorded at an *Urban Background* monitoring location in 2019, within 1.0km of the application site, was at Monitor CA10. Located within Tavistock Gardens, approximately 0.3km west of the application site, this monitor recorded an annual mean NO_2 concentration of 33.9 $\mu g.m^{-3}$ in 2019; 44% below the 60.0 $\mu g.m^{-3}$ threshold indicative of potential exceedances of the short-term (hourly) AQS for NO_2

6.10 It should also be noted that the existing air intakes are elevated approximately 10m above street-level. Therefore, pollutant concentrations at these intakes are likely to be further reduced in comparison to roadside (ground-level) concentrations; the result of greater pollutant dispersion with increasing height.

6.11 Despite exceedances of 60.0 $\mu g.m^{-3}$ (NO_2) at monitoring locations within 1.0km of the application site (as seen in Table 3.8), recorded PM_{10} concentrations, at each of LBC's automatic monitors within 1.0km of the application site, were well below the daily mean threshold (50.0 $\mu g.m^{-3}$).

6.12 Whilst NO_2 and PM_{10} can be assessed against short-term AQSs, $PM_{2.5}$ concentrations at LBC's automatic monitors can only be assessed against the respective annual mean AQS for $PM_{2.5}$ (20.0 $\mu g.m^{-3}$). Between 2018 and 2021, concentrations of PM2.5, monitored within 1.0km of the application site, were below this respective standard. For instance, at *Urban Background* monitor BL0, a concentration of 11.0 $\mu g.m^{-3}$ was recorded in 2019. Therefore, concentrations of PM_{10} and $PM_{2.5}$ across the development site are likely to be below their relevant thresholds.

6.13 In addition to this, estimated UK-AIR background and LAEI roadside pollutant concentrations further indicate that NO_2, PM_{10}, and $PM_{2.5}$ concentrations across, the development site, are likely to be below the relevant annual mean standards.

6.14 As such, the site is anticipated to be suitable for the introduction of new receptors that are relevant for the proposed end use (a hotel) .

Emergency Generator

6.15 An emergency generator is proposed to be used for life safety functions, involving the maintenance of power for sprinklers, emergency lighting and other critical infrastructure in the event of an emergency. The generator will not be used for the purpose of business. It is expected that the generator will not be tested for more than 50 hours per year.

6.16 Although the specification of the proposed generator is currently unknown, it is understood that the cumulative capacity of the generator will not exceed 1MWth, and that it will be sized appropriately for its sole purpose for life safety functions.

6.17 The generator exhaust extract will utilise the existing basement car park exhaust shaft, discharging above roof level and away from the nearest residential receptors located below.

7. Air Quality Neutral Assessment

7.1 The Air Quality Neutral Assessment (AQNA) compares the expected emissions from both traffic generation and building emissions with benchmarked emissions for particular land use classes derived from the recently adopted Air Quality Neutral guidance[23]. The proposed development falls under Land Use Class C1 (Hotels).

Transport Emissions

7.2 As confirmed by the transport consultants, RGP, the proposed development is expected to generate 26 two-way movements (AADT), of which 4 are HDVs (15% of total flows). The remaining traffic flows (22 AADT) will comprise hotel delivery and servicing trips, as well as taxis journeys. No on-site car parking will be provided to encourage guests to use public transportation to access the Hotel. With reference to the GLA's Air Quality Neutral guidance[23], these flows can be excluded from the Air Quality Neutral assessment.

7.3 As such, the proposed development's is anticipated to achieve air quality neutrality with respect to transport emissions.

Building Emissions

7.4 With regards to building emissions, the building's energy centre will be powered using Air Source Heat Pumps (ASHPs) and Photovoltaic Panels (PV). Furthermore, Mechanical Ventilation with Heat Recovery (MVHR) will be installed.

7.5 As such, the proposed development is not anticipated to produce any emissions of NO_x and particulate matter and shall therefore achieve air quality neutrality with respect to building emissions.

Mitigation

7.6 Despite achieving Air Quality Neutrality, further mitigation will be adopted, including:

- Cycle storage; and
- ULEZ compliant delivery vehicles will be utilised for all deliveries and collections once the hotel is operational.

8. Discussion

Construction Phase Impacts

8.1 The construction phase of the development could potentially give rise to emissions which could cause dust soiling effects on adjacent uses. Following the IAQM guidance, the construction phase of the proposed development can be considered to be *Medium Risk* with regards to dust soiling effects, *Low Risk* for PM_{10} health effects, and of *Negligible* Risk to ecological receptors.

8.2 After the implementation of the mitigation measures listed in Appendix A, and in Paragraph 5.22, the significance of each phase of the construction programme will be reduced and the residual significance of impact for the construction phase is expected to be *Negligible*, thus complying with the requirements of the NPPF.

Operational Phase Impacts

8.3 The need for a detailed pollutant dispersion modelling assessment of the proposed development's sensitivity to local air quality has been screened out using GLA and Defra guidance, along with UK-AIR, LAEI and local monitoring data. This was primarily due to baseline concentrations of NO_2, PM_{10} and $PM_{2.5}$ anticipated to be below their respective standards at the location of the proposed air intakes. Therefore, the site is considered to be suitable for the introduction of new, subterranean receptors, and no further assessment of site suitability is considered necessary.

8.4 As the proposed development is not expected to generate traffic flows exceeding the EPUK & IAQM thresholds on any specific road link, the need to undertake a detailed dispersion modelling assessment of the proposed development's impact on local air quality at existing sensitive receptor locations has been screened out with reference to the EPUK & IAQM guidance. Therefore, it can be reasonably assumed that the operation of the proposed development would have an insignificant impact on local air quality.

Air Quality Neutral Assessment

8.5 The proposed development will generate a total of 26 car trips (AADT), inclusive of 4 HDVs. The remaining traffic flows are anticipated to comprise servicing and delivery trips, as well as taxi flows. Therefore, with reference to the respective GLA guidance[23], these flows can be excluded from the Air Quality Neutral assessment.

8.6 No on-site parking is proposed, encouraging future guests to utilise existing public transportation to access the hotel. Furthermore, cycle storage is proposed to encourage this strategy.

8.7 Additionally, the proposed energy strategy relies on ASHP and PVs, rather than combustion sources. MVHR will additionally be installed.

8.8 Taking all of the above into account, it is considered reasonable to conclude that the proposed development will achieve air quality neutrality with respect to building and transport emissions.

9. Conclusions

9.1 Lazari Investments Limited commissioned Phlorum Limited to undertake an Air Quality Assessment for a proposed hotel, located beneath the existing Brunswick Centre, Bloomsbury. The development comprises the construction of 207 hotel rooms, with associated storerooms, a food and beverage area, and plant space. The development will be subterranean in nature.

9.2 London Atmospheric Emission Inventory, UK-AIR and local air quality monitoring data from the wider area suggest that whilst air quality within the surrounding area is poor at roadside locations, background pollution concentrations across the site, including at the location of the fresh air intake, are likely to be below the relevant UK Air Quality Standard concentrations. Therefore, the location of the proposed development is considered suitable for its proposed end-use (a hotel).

9.3 The construction of the development could potentially give rise to emissions which could cause dust soiling effects on adjacent uses. However, by adopting appropriate mitigation measures to reduce emissions and their potential impact, there should be no significant residual effects, thus complying with the requirements of the National Planning Policy Framework.

9.4 Due to the low volume of traffic that is expected to be generated by the proposed development, it is not anticipated to significantly impact local air quality at existing receptors surrounding the application site. Furthermore, the proposed development is anticipated to be air quality neutral in relation to building and transport emission.

9.5 The proposed development is expected to comply with all relevant local, London and national air quality policy. Air quality should not, therefore, pose any significant obstacles to the planning process.

Figures and Appendices

Figure 1: Site Location

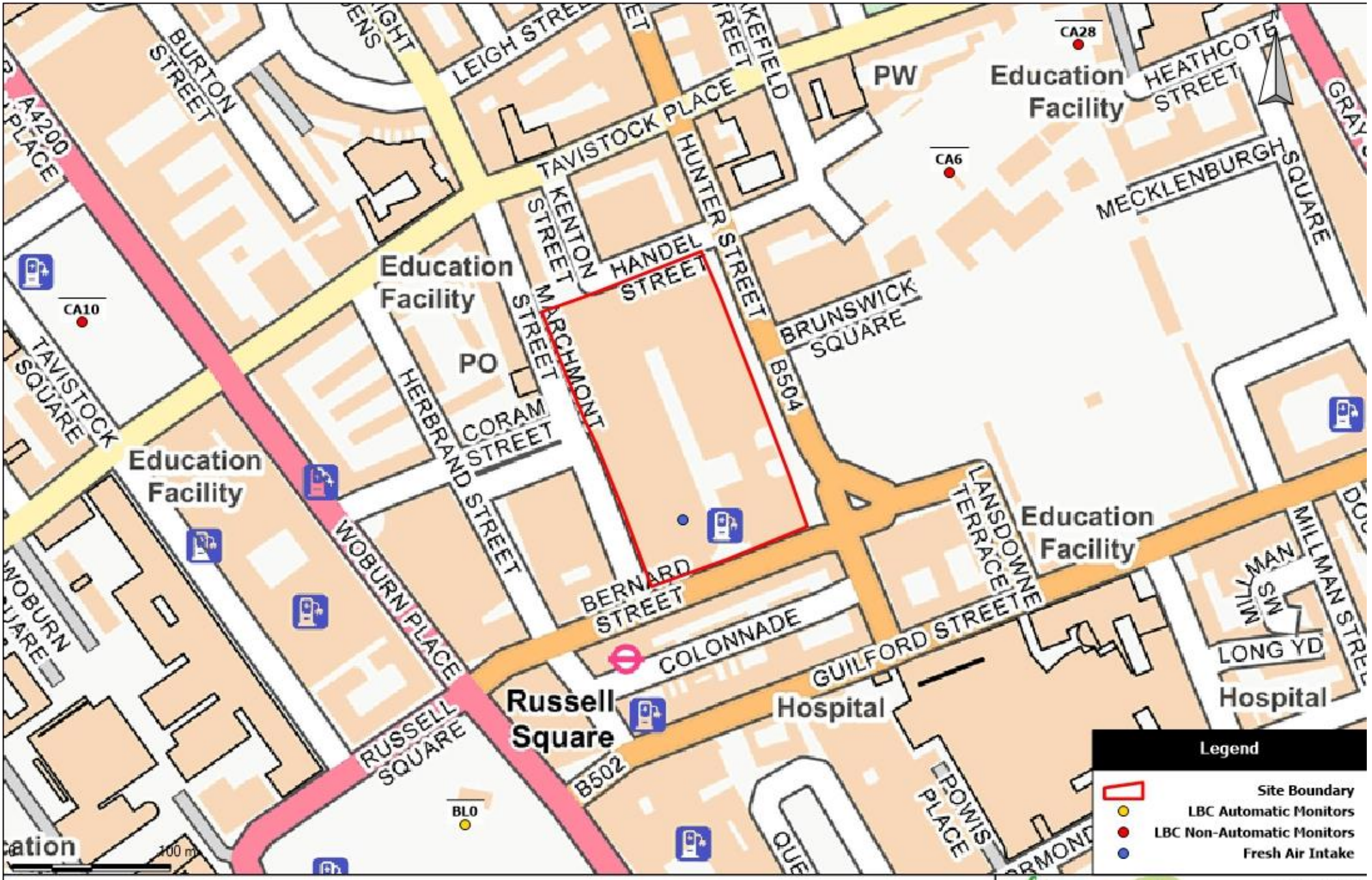

Figure 1: Site Location Plan

Job No: 12129.S
Drawn by: M.Batchelor
Printed at: 23/05/2023
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Appendix A: IAQM Highly Recommended Mitigation Measures for Low Risk Sites

Appendix A: IAQM Highly Recommended Mitigation Measures for sites with a Low Risk of Dust Impacts

Please refer to the IAQM's *Guidance on the assessment of dust from demolition and construction (2014)*[20] and *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites (2018)*[26] for further, "desirable", mitigation measures.

Communications

- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
- Display the head or regional office contact information.

Site Management

- Record all dust and air quality complaints, identify cause(s), 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 exception 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.

Monitoring

- Carry out regular site inspections to monitor compliance with the Dust Management Plan, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of inspections 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 dry or windy conditions.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Avoid site runoff of water or mud.

Operating Vehicles & Sustainable Travel

- 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.

26 IAQM. (2018). *Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites*.

Operations

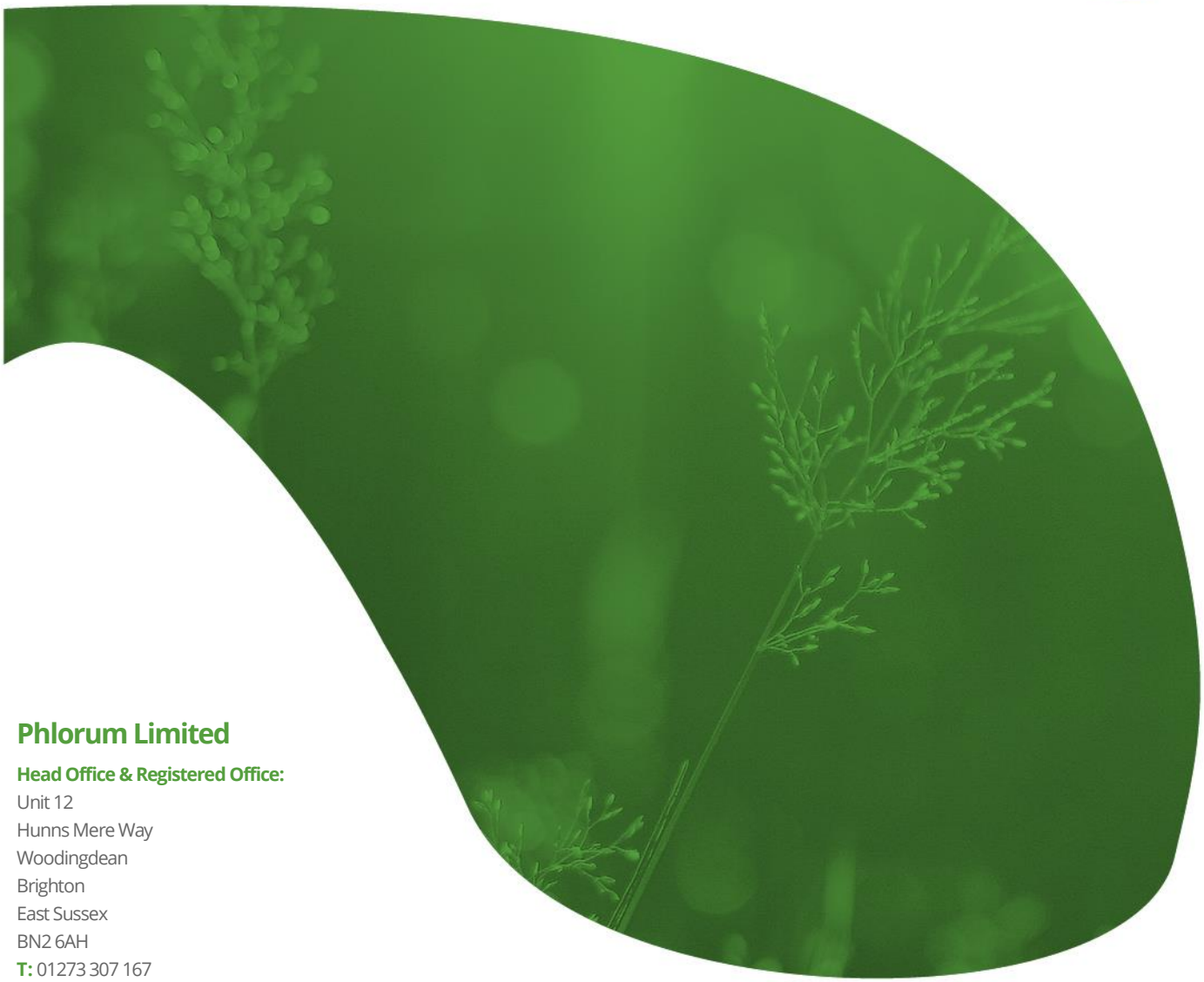
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, 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 equipment wherever appropriate.

Waste Management

- Avoid bonfires and burning of waste materials.

Trackout (*Medium Risk Mitigation Measures*)

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10m from receptors where possible.



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