St Mary’s House, Reading

Air Quality Assessment

V Goldstein

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Making Sustainability Happen

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Basis of Report

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1.0 Introduction

SLR Consulting Ltd (SLR) has been commissioned by V Goldstein to undertake an air quality assessment in support of a planning application for the '*proposed change of use of first to third floors from office (Class E) to provide serviced apartments (class C1). Addition of further floor to provide serviced apartments (class C1)*' (the 'Proposed Development') at St Mary's House, 66-68 St Mary's Butt, Reading, RG1 2LG (the 'Site').

The Site is in the administrative area of Reading Borough Council (RBC) at the approximate National Grid Reference (NGR): x471325, y173425. It is bounded by the following:

- Broad Street to the north with commercial properties beyond;
- Commercial properties and ground floor parking to the east;
- Commercial to the south, and 64-65 St Mary's Butt which has planning permission for conversion into 4 residential flats (RBC planning application number: 230659); and
- St Mary's Butt to the west with commercial properties beyond.

1.1 Scope of Assessment

Pre-application advice from RBC stated the requirement for an air quality assessment. Pre-assessment consultation was undertaken with the RBC Environmental Protection & Nuisance Team[1] to agree upon the extent and methodology of the air quality assessment. The following scope of works has been undertaken:

- Baseline Evaluation;
- Construction Phase Assessment;
- Operational Phase Assessment; and
- Mitigation Measures, as required.

[1] E-mail correspondence between SLR Consulting Ltd and Reading Borough Council, Environmental Protection & Nuisance team, Ross Jarvis – Principal Air Quality Project Officer. Sent 08/08/24, response received 19/08/24.

2.0 Relevant Air Quality Legislation and Guidance

2.1 Legislation

A dual set of regulations, separately applicable to National and Local Government, are currently operable within the UK.

2.1.1 National Obligations

The Air Quality Standards Regulations 2010[2] (AQSR) transpose both the EU Ambient Air Quality Directive (2008/50/EC), and the Fourth Daughter Directive (2004/107/EC) within UK legislation. The AQSR includes Limit Values which are legally binding ambient concentration thresholds which, however, are only applicable at specific locations (Schedule 1: AQSR)[3].

Following the UK's withdrawal from the EU, the Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020[4] was introduced to mirror revisions to supporting EU legislation. As a result, the fine particulate matter ($PM_{2.5}$) Limit Value was reduced to 20µg/m^3 (to be met by 2020).

The responsibility of achieving the AQSR is a National obligation for Central Government who undertake assessments on an annual basis. Local Authorities have no statutory obligation to achieve the AQSR or the European equivalent Directives, unless otherwise instructed to assist Central Government under Ministerial Direction.

2.1.1.1 Environmental Targets (Fine Particulate Matter) Regulations

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023[5] introduced an annual mean concentration target of 10µg/m^3 to be met across England by 2040. Central Government is responsible for meeting this future target, whereas Local Authorities have no statutory obligation to achieve this target.

2.1.2 Local Obligations

Part IV of the Environment Act 1995 (as amended by the Environment Act 2021) requires the Secretary of State to review the national Air Quality Strategy (AQS) every five years and modify this if necessary. It also established the system of Local Air Quality Management (LAQM) for Local Authorities to regularly review and assess air quality within their respective administrative areas.

The Air Quality (England) Regulations 2000 (as amended) provide the statutory basis for the Air Quality Objectives Local Authorities must adhere to under LAQM in England. $PM_{2.5}$ is not currently part of the LAQM framework; however, as per the national AQS, Local Authorities are required to work towards reducing $PM_{2.5}$.

The Air Quality Objectives apply at locations where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period (referred to as 'relevant exposure'). Table 2-2 provides an indication of those locations. Where any of the prescribed Air Quality Objectives are not

[2] The Air Quality Standards Regulations (England) 2010, Statutory Instrument No 1001, The Stationary Office Limited.

[3] Schedule 1 of the 2010 AQSR provides the locations of the sampling points where the AQSR Limits Values can be assessed.

[4] The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020, Statutory Instrument No. 1313, The Stationary Office Limited.

[5] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023. UK Statutory Instruments 2023 No. 96.

likely to be achieved, the authority must designate an Air Quality Management Area (AQMA). For each AQMA, the local authority is required to prepare an Air Quality Action Plan (AQAP), which details measures the authority intends to introduce to deliver improvements in local air quality and achieve compliance.

The latest AQS for England was published in 2023[6]. The AQS provides the delivery framework for air quality management across England for local authorities and summarises the air quality standards and objectives operable within England for the protection of public health and the environment.

The ambient air quality standards of relevance to this assessment (collectively termed Air Quality Assessment Levels (AQALs) throughout this report) are provided in Table 2-1. These are primarily based upon the Air Quality Objectives Local Authorities are responsible for achieving. The $PM_{2.5}$ AQSR AQAL has also been included for completeness.

Table 2-1: Relevant Ambient AQALs (England)

Pollutant	Standard (µg/m^3)	Averaging Period
Nitrogen Dioxide (NO_2)	40	Annual mean
	200	1-hour mean (not to be exceeded on more than 18 occasions per annum)
Particles (as PM_{10})	40	Annual mean
	50	24-hour mean (not to be exceeded on more than 35 occasions per annum)
Particles (as $PM_{2.5}$)	20	Annual mean

Table 2-2: Human Health Relevant Exposure

AQAL Averaging Period	AQALs should apply at	AQALs should not apply at
Annual mean	Building facades of residential properties, schools, hospitals etc.	Facades of offices Hotels Gardens of residences Kerbside sites
24-hour mean	As above together with hotels and gardens of residential properties	Kerbside sites where public exposure is expected to be short term
1-hour mean	As above together with kerbside sites of regular access, car parks, bus stations etc.	Kerbside sites where public would not be expected to have regular access

2.1.3 Environmental Protection Act 1990

The Environmental Protection Act 1990[7] sets out provisions for the regulation of statutory nuisances. Section 79 sets out this statutory nuisance as, 'any dust, steam, smell or other effluvia arising on industrial, trade or business premises and being prejudicial to health or a nuisance'.

[6] Defra, Air Quality Strategy: Framework for Local Authority Delivery, April 2023.

[7] The Environmental Protection Act 1990. Available at http://www.legislation.gov.uk/ukpga/1990/43/contents.

Section 79 requires that, where a complaint of a statutory nuisance is made to it by a person living within its area, a Local Authority must take steps as are reasonably practicable to investigate the complaint.

Fractions of dust greater than 10µm (i.e. greater than PM_{10}) in diameter typically relate to nuisance effects as opposed to potential health effects and therefore are not covered within the UK AQS. In legislation there are currently no numerical limits in terms of what level of dust deposition constitutes a nuisance.

2.2 Policy

2.2.1 National Policy

2.2.1.1 Clean Air Strategy

The 2019 Clean Air Strategy[8] sets out the Government's proposals aimed at delivering cleaner air in England and indicates how devolved administrations intend to make emissions reductions. It sets out the comprehensive action that is required from across all parts of government and society to deliver clean air.

2.2.1.2 Environmental Improvement Plan 2023

The 2023 Environmental Improvement Plan[9] is the first revision of the UK Government's 25 Year Environment Plan (25YEP) – planned on a five-year rolling cycle. This document sets out the 5-year delivery plan to improve the natural environment. The 2023 Environmental Improvement Plan builds on the 2019 Clean Air Strategy by setting environmental targets and commitments to reduce air pollution. Goal 2 of the 25YEP is Clean Air – which relates to improving air quality.

2.2.1.3 National Planning Policy Framework

The December 2023 update to the National Planning Policy Framework[10] (NPPF) sets out planning policy for England. The NPPF states that the planning system should contribute to and enhance the natural and local environment, by preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution and development should, wherever possible, help to improve local environmental conditions such as air quality.

In specific relation to air quality policy, the document states:

Chapter 15 – Conserving and Enhancing the Natural Environment

> "*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*

[8] Defra, The Clean Air Strategy, January 2019.

[9] Defra, Environmental Improvement Plan 2023, 2023.

[10] National Planning Policy Framework, Ministry of Housing, Communities & Local Government. December 2023.

development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan."

The NPPF is accompanied by web based supporting Planning Practice Guidance (PPG)[11] which includes guiding principles on how planning can take account of the impacts of new development on air quality. The November 2019 update details several factors that may need to be considered within an air quality assessment. Assessments and mitigation options need to be proportionate to the nature and scale of development proposed and potential impacts (taking into account existing conditions).

2.2.2 Local Policy

The Reading Borough Local Plan[12] was adopted by RBC in November 2019. It contains the following policy of relevance to air quality:

Policy EN15: Air Quality

"*Development should have regard to the need to improve air quality and reduce the effects of poor air quality.*

i. Development that would detrimentally affect air quality will not be permitted unless the effect is to be mitigated. The following criteria should be taken into account:

- *Whether the proposal, including when combined with the cumulative effect of other developments already permitted, would worsen air quality;*
- *Whether the development is within, or accessed via, an Air Quality Management Area; and*
- *Whether it can be demonstrated that a local worsening in air quality that would not detrimentally affect human health or the environment would be offset by an overall improvement in air quality, for instance through reduction in the need to travel.*

ii. Where a development would introduce sensitive uses (such as residential, schools and nurseries, hospitals, care facilities) into, or intensify such uses within, an Air Quality Management Area, detrimental effects on that use will be mitigated. Mitigation measures should be detailed in any planning application. If there are significant detrimental effects that cannot be mitigated, the application should be refused.

iii. Where required, planning obligations will be used to secure contributions to measures to tackle poor air quality or for air quality monitoring."

2.3 Assessment Guidance

The air quality assessment has been carried out in accordance with the principles contained within the following guidance documents:

- Department for Environment, Food and Rural Affairs (Defra): Local Air Quality Management Technical Guidance (TG22) (LAQM.TG22)[13];

[11] Planning Practice Guidance Air Quality, Ministry of Housing, Communities and Local Government. November 2019.

[12] Reading Borough Council, Reading Borough Local Plan, adopted November 2019.

[13] Local Air Quality Management Technical Guidance (TG22), Published by Defra in partnership with the Scottish Government, Welsh Government and Department of Agriculture, Environment and Rural Affairs Northern Ireland. August 2022.

- Defra: COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021[14];
- Environmental Policy Implementation Community (EPIC) (formerly EPUK) and the Institute of Air Quality Management (IAQM): Land-Use Planning & Development Control: Planning for Air Quality[15];
- IAQM: Guidance on the Assessment of Dust from Demolition and Construction[16]; and
- IAQM: Position Statement: Use of 2020 and 2021 Monitoring Datasets[17].

[14] Defra and the Greater London Authority, COVID-19: Supplementary Guidance. Local Air Quality Management Reporting in 2021. April 2021.

[15] EPIC (formerly EPUK) and IAQM, Land-Use Planning and Development Control: Planning for Air Quality, v1.2 2017.

[16] IAQM, Guidance on the Assessment of Dust from Demolition and Construction, v2.2 January 2024.

[17] IAQM, Position Statement: Use of 2020 and 2021 Monitoring Datasets, Version 1.1, December 2023.

3.0 Assessment Methodology

3.1 Construction Phase

The assessment has been undertaken in accordance with the IAQM guidance. The assessment of risk is determined by considering the risk of dust effects arising from four activities in the absence of mitigation:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The assessment methodology considers three separate dust impacts with account being taken of the sensitivity of the area that may experience these effects:

- Annoyance due to dust soiling;
- The risk of health effects due to an increase in exposure to PM_{10}; and
- Harm to ecological receptors.

The first stage of the assessment involves a screening to determine if there are sensitive receptors within threshold distances of the Site activities associated with the construction phase of the scheme. A detailed assessment is required where a:

- Human receptor is located within 250m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s); and/or
- Ecological receptor is located within 50m of the Site, and/or within 50m of routes used by construction vehicles, up to 250m from the Site entrance(s).

The dust emission class (or magnitude) for each activity is determined on the basis of the guidance, indicative thresholds and professional judgement. The risk of dust effects arising is based upon the relationship between the dust emission magnitude and the sensitivity of the area. The risk of impact is then used to determine the appropriate mitigation requirements, whereby through effective application, residual effects are considered to be 'not significant'.

Given the short-term nature of the construction phase and the low volume of vehicle movements that will likely arise, there is not considered to be any potential for significant air quality effects from construction-generated road traffic emissions. Such potential effects have therefore been scoped out from requiring assessment based on their assumed insignificant impact.

3.2 Operational Phase

3.2.1 Road Traffic Emissions Screening

The assessment of air quality effects in relation to the development's operational phase has been undertaken in accordance with EPIC & IAQM guidance.

The EPIC & IAQM guidance provides a series of indicative screening criteria where, if exceeded, further assessment is required. If the Site is found not to exceed any of the relevant indicative criteria presented, then a detailed impact assessment is consequently not required, and effects are concluded to be 'insignificant'.

The indicative screening criteria relevant for this assessment are as follows (specific to locations within an AQMA):

- A change of Light-Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT); and/or
- A change of Heavy-Duty Vehicle (HDV) flows of more than 25 AADT.

Traffic data used for the purposes of the screening assessment has been provided by Peter Evans Partnership – the appointed transport consultant.

3.2.2 Site Suitability Assessment

A site suitability assessment is required to assess the likely exposure future occupants of the Proposed Development may experience in respect of the considered AQALs, to ensure the Site is suitable for its proposed residential use. The scope of the site suitability assessment has been informed by the EPIC & IAQM guidance requirements, and in relation to the Site locale considers:

- The background and future baseline air quality and whether this will be likely to approach or exceed an AQAL;
- The presence and location of any AQMAs as an indicator of local hotspots where the AQALs may be exceeded; and
- The presence of a heavily trafficked road, with emissions that could give rise to sufficiently high concentrations of pollutants (in particular NO_2), that would cause unacceptably high exposure for users of the new development.

To determine the overall significance with respect to the suitability of the Site for future occupants and likely exposure to pollutant concentrations, the EPIC & IAQM guidance states:

> "*Where the air quality is such that an air quality objective at the building façade is not met, the effect on residents or occupants will be judged as significant, unless provision is made to reduce their exposure by some means.*"

In line with this, a qualitative site suitability assessment has been undertaken, with reference to publicly available data relative to the AQALs (detailed in Table 2-1), to determine whether further consideration is required or whether effects can be considered 'not significant'.

4.0 Baseline Environment

4.1 Baseline Air Quality

Pollutant concentrations monitored during 2020 and 2021 (i.e. affected by the COVID-19 pandemic) are expected to be atypical and not representative of the local environment. Whilst not considered for the determination of baseline conditions (as per Defra guidance and an IAQM position statement) they have been presented for completeness.

4.1.1 LAQM Review and Assessment

RBC, in fulfilment of statutory requirements, has conducted an on-going exercise to review and assess air quality within their administrative area. The most recent Air Quality Annual Status Reports (ASR)[18, 19] have been reviewed. The 2024 ASR has not yet been approved by Defra and the monitoring data contained within is therefore considered provisional.

RBC currently has one AQMA declared due to exceedances of the annual mean NO_2 AQAL at locations of relevant exposure, known as the Reading AQMA. The Site is contained within this AQMA.

4.1.2 Review of Air Quality Monitoring

4.1.2.1 Automatic Air Quality Monitoring

RBC undertake automatic air quality monitoring at four locations across their administrative area – one 'urban background' affiliated with Defra's Automatic Urban and Rural Network (AURN), and three 'roadside' locations.

From review of the Site locale, RD1 is located approximately 1km north of the Site. The details and results of RD1 are presented in Table 4-1 and Table 4-2 respectively, whilst its location is illustrated in Figure 4-1.

Table 4-1: Automatic Monitoring Sites: Details

Site ID	Site Type	NGR (m)		Approx. Distance to Site (m)
		X	Y	
RD1	Roadside	471153	174429	1,005

Table 4-2: Automatic Monitoring Sites: Results

Site ID	Year	PM_{10}		NO_2	
		Annual Mean Concentration (µg/m³)	Number of Daily Means >50µg/m³	Annual Mean Concentration (µg/m³)	Number of 1-hour Means >200µg/m³
RD1	2018	24	3	40	7
	2019	24	11	35	0
	2020	20	5	25	0
	2021	20	2	26	0
	2022	25	6	27	1

[18] Reading Borough Council, 2023 Air Quality Annual Status Report (ASR), June 2023.

[19] Reading Borough Council, 2024 Air Quality Annual Status Report (ASR), June 2024.

Site ID	Year	PM_{10}		NO_2	
		Annual Mean Concentration (µg/m³)	Number of Daily Means >50µg/m³	Annual Mean Concentration (µg/m³)	Number of 1-hour Means >200µg/m³
	2023	21	0	24	0
Table note: At the time of writing 2023 monitoring data had not been approved by Defra and is therefore provisional.					

As presented in Table 4-2, annual mean PM_{10} and NO_2 concentrations at monitor RD1 have generally been below the respective AQALs prior to and since the COVID-19 pandemic. This is except for the NO_2 concentration in 2018, where the annual mean was at the AQAL of 40µg/m³. The 24-hour mean PM_{10}, and 1-hour mean NO_2 concentrations were below the AQALs across the period.

RD1 is within the Reading AQMA and located at the roadside of the A4155 Caversham Road, near to a roundabout. Elevated pollutant concentrations may therefore be anticipated at this location.

4.1.2.2 Passive Diffusion Tube Monitoring

Passive NO_2 diffusion tube monitoring is currently undertaken by RBC at several locations across their administrative area, in fulfilment of statutory LAQM obligations.

The details and results of the monitoring locations of relevance to the Site (i.e. located within approximately 1km) are presented in Table 4-3 and Table 4-4 respectively, whilst their locations are illustrated in Figure 4-1. All monitoring data presented has been ratified by RBC.

Table 4-3: LAQM Diffusion Tube Monitoring Sites: Details

Site ID	Site Name	Site Type	NGR (m)		Approx. Distance to Site (m)
			X	Y	
RD001	10 Trinity Place	Roadside	470738	173433	570
RD002	108 Caversham Rd	Roadside	471293	174236	800
RD003	128 Castle Hill	Roadside	470987	173016	515
RD004	131 Caversham Rd	Roadside	471261	174236	800
RD007	162a Castle Hill	Roadside	470835	172992	640
RD008	165 Oxford Rd	Roadside	470717	173373	600
RD012	197 Caversham Rd	Roadside	471161	174379	955
RD013	21A Friars Walk, Friars Street	Roadside	471373	173584	155
RD018	31a Vastern Rd	Roadside	471420	174129	700
RD020	33 Caversham Rd	Roadside	471123	173734	350
RD026	44 Crown Street	Roadside	471717	172856	675
RD036	Blenheim Terrace, Castle Hill	Roadside	471061	173018	470

Site ID	Site Name	Site Type	NGR (m)		Approx. Distance to Site (m)
			X	Y	
RD037, RD038, RD039	Caversham AQMS	Roadside	471156	174424	1,000
RD040	Caversham Road (Old Post Office)	Roadside	471202	173869	450
RD046	Friar St (Nandos)	Roadside	471437	173589	190
RD047	King Oak Flats	Roadside	472015	173223	705
RD048	Malcolm Place	Roadside	471174	173846	430
RD049	Malmaison	Roadside	471509	173705	325
RD050	Malthouse Lane	Roadside	470808	173512	510
RD052	Red Cow	Roadside	471685	172853	660
RD054	Sackville Street	Roadside	471177	173641	245
RD055	Sainsburys 52-55 Friar Street	Kerbside	471320	173577	140
RD058	Sidmouth Street - Trinity Hall	Roadside	472071	173157	780
RD059	Station Hill (Near Bus stop WN)	Roadside	471324	173820	380
RD060	Station Hill (Near Taxi Rank)	Roadside	471413	173808	380
RD061	Tamar House	Roadside	471508	173663	290
RD062	The Butler	Roadside	470906	173517	410

Table 4-4: LAQM Diffusion Tube Monitoring Sites: Results

Site ID	Valid Data Capture 2023 (%)	Annual Mean NO_2 Concentration (µg/m^3)					
		2018	2019	2020	2021	2022	2023
RD001	100	31.9	26.1	21.3	22.3	22.4	26.5
RD002	100	41.5	35.3	26.5	28.7	29.4	27.6
RD003	100	42.4	38.6	26.0	32.2	30.3	27.5
RD004	100	34.8	32.0	22.2	27.3	26.2	23.2
RD007	100	35.3	33.7	25.3	29.6	26.3	25.0
RD008	100	42.3	36.5	28.2	30.5	29.9	23.9
RD012	100	33.5	30.5	25.0	29.7	29.3	26.2
RD013	57.7	-	38.9	30.6	37.6	38.8	33.9
RD018	100	33.0	27.9	23.7	25.4	24.8	23.9
RD020	82.7	44.2	35.5	27.0	32.4	30.1	32.9
RD026	92.3	34.0	29.4	22.3	26.8	24.2	21.7
RD036	84.6	33.0	34.1	26.8	29.8	27.6	26.8

Site ID	Valid Data Capture 2023 (%)	Annual Mean NO_2 Concentration (µg/m^3)					
		2018	2019	2020	2021	2022	2023
RD037, RD038, RD039	100	-	-	-	-	-	24.3
RD040	42.3	-	-	-	-	-	37.1
RD046	100	42.0	41.0	28.5	35.9	38.0	36.7
RD047	100	32.1	27.9	20.1	24.1	22.5	21.1
RD048	92.3	39.2	52.4	40.0	42.1	43.3	42.6
RD049	100	-	-	29.1	33.6	35.0	33.2
RD050	100	-	30.9	23.7	25.1	24.9	23.2
RD052	100	37.6	31.4	24.5	28.7	26.9	24.6
RD054	100	37.7	32.0	23.6	27.3	26.8	25.8
RD055	100	-	40.3	30.0	38.2	37.6	38.9
RD058	90.4	37.0	34.0	23.2	25.2	25.2	25.0
RD059	92.3	35.0	38.0	31.3	32.6	29.0	31.9
RD060	90.4	33.0	35.4	26.9	29.1	27.4	29.8
RD061	42.3	-	-	-	-	-	36.5
RD062	100	-	32.0	24.7	28.8	30.4	27.2
Table note: At the time of writing 2023 monitoring data had not been approved by Defra and is therefore provisional.							

As displayed in Table 4-4, annual mean NO_2 concentrations at the monitors presented have generally been below the annual mean AQAL (40µg/m^3) across the period presented. This is except for a few monitors and/or years – monitors RD002, RD003, RD008 and RD020 in 2018; RD046 in 2018/2019; RD048 in 2019-2023, and RD055 in 2019.

Monitors RD002, RD003, RD008, RD020, and RD048 are located in the Reading AQMA at the roadside of main A-roads, where elevated concentrations would be expected. Monitors RD046 and RD055 are located within the town centre on Friar Street – which is lined with bus stops. Given this, elevated concentrations may also be anticipated in this area.

By comparison, the Site is located away from major A-roads in the town centre, and the surrounding roads are either pedestrianised (Broad Street) or one-way with traffic restrictions on certain times of day/vehicles (St Mary's Butt). Concentrations anticipated at the Site are therefore likely to be lower than the monitors discussed.

Monitor RD048 is the only nearby monitor to record annual mean NO_2 concentrations above the AQAL in 2022/2023 (i.e. following the COVID-19 pandemic). Generally, comparison of 2018/2019 concentrations (pre-COVID-19) with 2022/2023 concentrations (post-COVID-19) show a decline. However, further monitoring data would be needed to verify any trends post COVID-19.

The empirical relationship given in LAQM.TG22 states that exceedances of the 1-hour mean AQAL for NO_2 is unlikely to occur where annual mean concentrations are <60µg/m^3. This indicates that an exceedance of the 1-hour mean AQAL was unlikely to have occurred at the monitors presented for the period assessed.

4.1.3 Defra Mapped Background Concentrations

Defra maintains a nationwide model of existing and future background air quality concentrations at a 1km grid square resolution which is routinely used to support LAQM requirements and air quality assessments. The data sets include annual average concentration estimates for NO_2, PM_{10} and $PM_{2.5}$ using a base year of 2018 (the year in which comparisons between modelled and monitored concentrations are made)[20].

The Defra mapped annual mean background concentrations for the base year (2023) and earliest predicted opening year of the development (2027) for the grid square containing the Site are presented in Table 4-5.

All the mapped background concentrations presented for the predicted opening year (2027) are well below the respective annual mean AQALs.

Table 4-5: Defra Background Pollutant Concentrations

Grid Square (X, Y)	Year	Annual Mean Background Concentration (µg/m³)		
		NO_2	PM_{10}	$PM_{2.5}$
471500, 173500	2023	31.5	17.5	12.4
	2027	29.6	16.8	11.7
AQAL		***40***	***40***	***20***

4.1.4 Defra's Pollution Climate Mapping Model

The Pollution Climate Mapping (PCM) model is a collection of models which provides the base and future projections of annual mean pollutant concentrations across the UK. The PCM model provides NO_2 concentrations predicted at roadside locations for major roads in the UK. These modelled predictions relate to receptor locations situated 4m from the road at a height of 2m and therefore exhibit roadside conditions where concentrations are expected to decline with further distance from the road source.

The dataset includes semi-empirical roadside annual average concentration estimates for NO_2 using a base year of 2018 (the year in which comparisons between modelled and monitored concentrations are made).

The PCM link closest to the Site is the A329 – Inner Distribution Road (Census ID: 802027954), located approximately 240m west of the Site. Predicted annual mean NO_2 concentrations at the Site would be anticipated to be much lower than those modelled on the PCM link, given the Site is set back from major A-roads in a partly pedestrianised location.

The 2023 (baseline year) and 2027 (the earliest anticipated opening year of development) annual mean NO_2 concentrations predicted for the link are presented in Table 4-6, whilst the location is illustrated in Figure 4-1.

The predicted annual mean NO_2 concentrations for 2023 and 2027 are below the AQAL.

Table 4-6: PCM Modelled Annual Mean NO_2 Concentrations

Road Link	Census ID	Predicted Annual Mean Concentration (µg/m³)	
		2023	2027
A329 – Inner Distribution Road	802027954	37.5	32.4

[20] Defra Background Maps (2018 Reference).

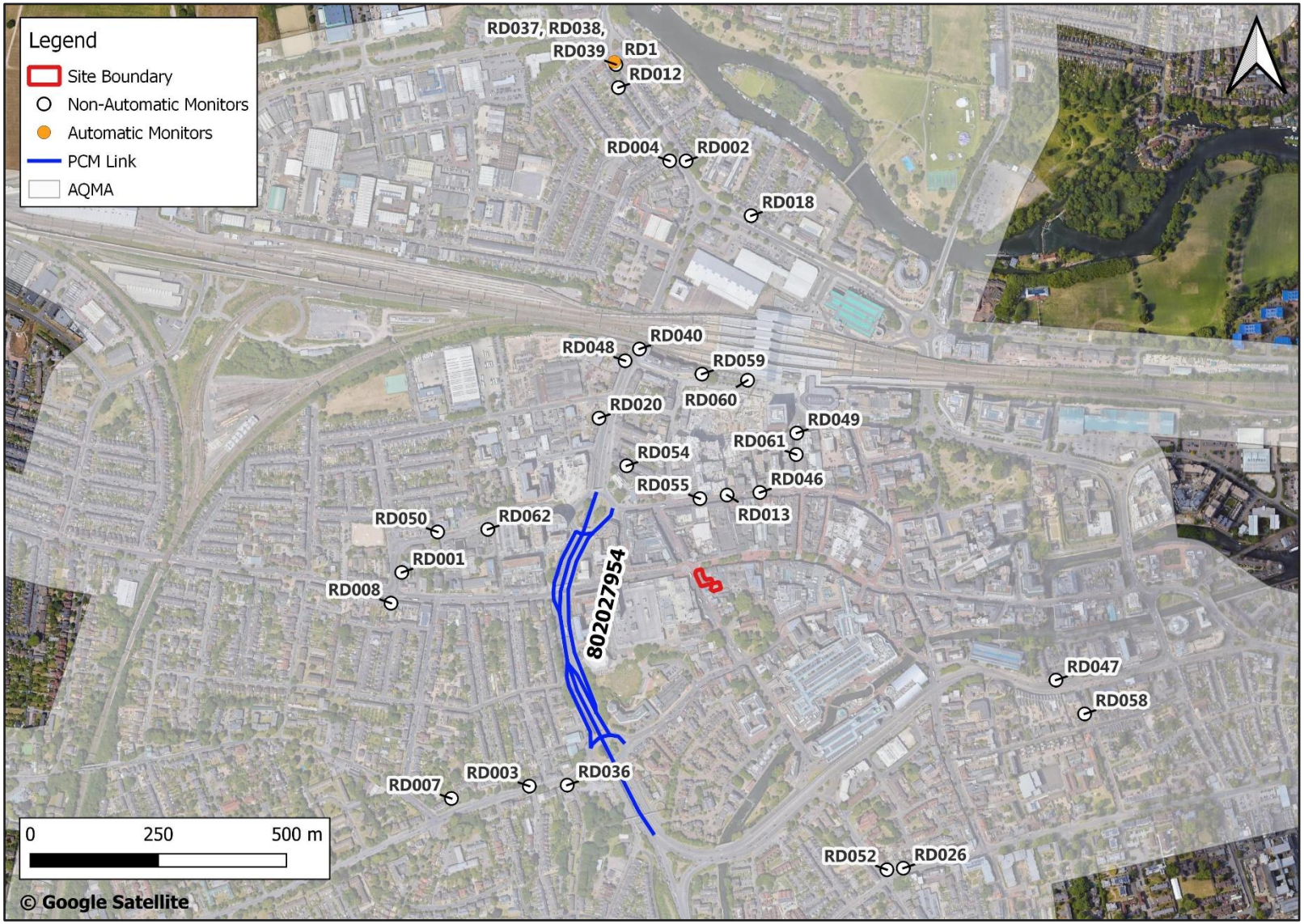


Figure 4-1: Site Setting and LAQM Monitoring Locations

5.0 Construction Phase

This section presents the potential air quality impacts and effects associated with the construction of the Proposed Development in terms of dust.

5.1 Construction Dust Assessment

Where figures relating to area of the site, volume of the site, approximate number of construction vehicles or distances to receptors are given, these relate to thresholds as defined in the IAQM guidance to guide the assessor to define the dust emissions magnitude and sensitivity of the area.

5.1.1 Assessment Screening

As shown in Figure 5-1, there are 'human receptors' within 250m of the Site but no designated habitat sites within 50m of the Site boundary or within 50m of the roads anticipated to witness construction traffic movements up to 250m from the Site. Therefore, an assessment of construction dust on human receptors only is required.

5.1.2 Potential Dust Emission Magnitude

5.1.2.1 Demolition

The majority of the existing building will be retained; however, some minor structural changes will be required to facilitate the additional floor. These activities would occur on a building volume considerably <12,000m^3. Given that these activities may be undertaken at >12m above ground level, these have been considered in the assessment to present a conservative approach. Therefore, the dust emission magnitude for demolition is considered 'small'.

5.1.2.2 Earthworks

As the current infrastructure will be retained, earthworks activities are not required and have therefore been scoped out of the assessment.

5.1.2.3 Construction

The total building volume requiring construction is estimated to be <12,000m^3. It has been assumed that potentially dusty construction material (i.e. concrete) may be used. Therefore, the dust emission magnitude with respect to construction is considered 'small'.

5.1.2.4 Trackout

In consideration of the current Site use and condition/surface of the surrounding area/road network, there is no potential for unpaved roads and trackout has therefore been scoped out of the assessment.

5.1.2.5 Summary

A summary of the dust emission magnitude for the assessed activities is detailed in Table 5-1.

Table 5-1: Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Construction	Small

5.1.3 Sensitivity of the Area

5.1.3.1 Dust Soiling Impacts

From review of the Site locale, there are estimated to be 1-10 high sensitivity receptors within 20m of the Site boundary (considering the consented RBC planning application number: 230659, for 4 residential flats at 64-65 St Mary's Butt), and <100 high sensitivity receptors within 50m.

The sensitivity of the area with respect to dust soiling effects on people and property in relation to demolition and construction is therefore 'medium'.

5.1.3.2 Human Health Impacts

The 2023 mapped background PM_{10} concentration for the grid square centred on the Site is estimated to be 17.5µg/m³ (i.e. falls into the <24µg/m^3 class) (see Table 4-5). As discussed, no representative local background PM_{10} monitoring exists within the development locale.

Based on the above figures regarding the number of high sensitivity receptors within 20m of the Site boundary. The sensitivity of the area with respect to human health impacts in relation to demolition and construction is considered 'low'.

5.1.3.3 Summary

A summary of the sensitivity of the surrounding area is detailed in Table 5-2, whilst the Site locale is displayed in Figure 5-1.

Table 5-2: Sensitivity of the Area

Potential Impact	Sensitivity of Surrounding Area	
	Demolition	Construction
Dust Soiling	Medium	Medium
Human Health	Low	Low

5.1.4 Risk of Impacts (Unmitigated)

The outcome of the assessment of the potential 'dust emission magnitude', and the 'sensitivity of the area' are combined in Table 5-3 below to determine the risk of impact which is used to inform the selection of appropriate mitigation.

Table 5-3: Risk of Dust Impacts (Unmitigated)

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

Following the construction dust assessment, the Site is found to be at worst 'low risk' in relation to dust soiling effects on people and property, and 'negligible' in relation to human health impacts (Table 5-3). However, potential dust effects during the construction phase are considered to be temporary in nature and may only arise at particular times (i.e. certain activities and/or meteorological conditions).

Nonetheless, commensurate with the above designation of dust risk, mitigation measures, as identified by IAQM guidance are required to ensure that any potential impacts arising from the construction phase of the Proposed Development are reduced and, where possible, completely removed. In accordance with IAQM guidance, providing effective mitigation measures are implemented, such as those outlined in Section 7.1, construction dust effects are considered to be 'not significant'.

Figure 5-1: Construction Dust Assessment Buffers

6.0 Operational Phase Assessment

This section presents the potential air quality impacts and effects associated with the operation of the Proposed Development.

6.1 Road Traffic Emissions Screening

Peter Evans Partnership has provided information in relation to the operational road traffic flows generated by the Proposed Development upon the local road network. These have been compared to the relevant EPIC & IAQM indicative screening criteria.

The Proposed Development is considered 'car free', whereby it does not provide vehicle parking for occupants. The vehicle trip generation exercise has therefore considered delivery/servicing vehicles and taxis – assumed to be majority LDVs.

The Proposed Development is predicted to generate 12 AADT (as LDVs).

By comparison, the existing office use would be expected to generate approximately 107 AADT in the area (as the Site does not provide vehicle parking, nearby parking facilities may be used). As such, the Proposed Development would result in a net reduction of operational road traffic flows compared to the existing office use.

Considering the above, road traffic flows generated by the Proposed Development on the local road network are found to be below the relevant EPIC & IAQM screening criteria. The operational effects on local air quality arising from road traffic emissions associated with the Proposed Development can be considered 'insignificant' and further detailed assessment is not required.

6.2 Site Suitability Assessment

With reference to EPIC & IAQM guidance and the information already discussed in Section 4.1, the following information has been used to inform the suitability of the Site for its proposed residential use:

- The Site is within the Reading AQMA. However, the AQMA covers a large area of Reading town centre, and this does not necessarily mean that the whole AQMA exceeds the annual mean NO_2 AQAL (which the declaration relates to). The approach of declaring a larger area is instead used for policy/planning purposes, to streamline decision-making in relation to air quality;
- The majority of monitoring locations within 1km of the Site have recorded annual mean NO_2 concentrations below the AQAL across the period 2018-2023. The monitors where exceedances have been recorded are located adjacent to major A-roads or on Friar Street (which is lined with bus stops). By comparison, the Site is set away from major A-roads in a partly pedestrianised area and anticipated concentrations at the Site would therefore be lower;
- No exceedances of the 1-hour mean NO_2 AQAL have been recorded at the closest automatic monitor to Site (RD1) across the period 2018-2023. The empirical relationship given in LAQM.TG22 indicates that exceedances were also unlikely at the diffusion tubes within approximately 1km of the Site;
- The annual mean and 24-hour mean PM_{10} concentrations recorded at the closest automatic monitor to Site (RD1) have been below the respective AQALs across the period 2018-2023;
- The Defra mapped background concentrations predicted at the Site in the anticipated development opening year (2027) are 'well below' the respective AQALs;

- The nearest PCM link to the Site, A329 – Inner Distribution Road (Census ID: 802027954), predicts an annual mean NO_2 concentration of 32.4µg/m^3 in 2027, therefore below the AQAL. Concentrations at the Site are expected to be much less than this; and
- The Proposed Development is considered 'car free', and additionally generates road traffic volumes below the relevant EPIC & IAQM screening criteria.

Given the above information, in line with the EPIC & IAQM guidance, the Site is found to be suitable for its proposed residential use. A detailed site suitability assessment is not considered to be required, and pollutant concentrations are predicted to be below the respective AQALs across the Site. Effects associated with likely exposure of future residents of the Proposed Development are considered to be 'not significant'.

7.0 Mitigation Measures

This section presents any proportionate mitigation measures required during the construction and operational phases of the Proposed Development.

7.1 Construction Phase

The IAQM guidance outlines a number of site-specific mitigation measures based on the assessed site risk. The measures are grouped into those which are highly recommended and those which are desirable. With the effective application of the dust mitigation measures, as detailed in Table 7-1, residual effects are considered to be 'not significant'.

Table 7-1: Construction Dust Mitigation Measures

Site Application	Mitigation Measure
Highly Recommended	
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.
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 such equipment wherever appropriate.
Monitoring	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site 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.
	Agree dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspection locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Operating Vehicle / Machinery and Sustainable Travel	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.
Preparing and Maintaining the Site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Avoid site runoff of water or mud.

Site Application	Mitigation Measure
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 exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.
Demolition	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.
	Bag and remove any biological debris or damp down such material before demolition.
Waste Management	Avoid bonfires and burning of waste materials.
Desirable	
Communications	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
Monitoring	Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary.
Operating Vehicle / Machinery and Sustainable Travel	Impose and signpost a maximum-speed-limit of 15mph on surfaced and 10mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
Preparing and Maintaining the Site	Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
	Cover, seed or fence stockpiles to prevent wind whipping.
Operations	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

7.2 Operational Phase

In accordance with EPIC & IAQM guidance, road traffic impacts associated with the operation of the Site can be considered as having an insignificant effect on local air quality. Furthermore, the Site is found to be suitable for residential purposes.

Long-term scheme-specific mitigation measures are therefore not required to mitigate operational effects, however, will be considered and included as part of the detailed design in line with good practice.

8.0 Conclusions

SLR has undertaken an air quality assessment to support a planning application for the '*proposed change of use of first to third floors from office (Class E) to provide serviced apartments (class C1). Addition of further floor to provide serviced apartments (class C1)*' at St Mary's House, 66-68 St Mary's Butt, Reading.

8.1 Construction Phase

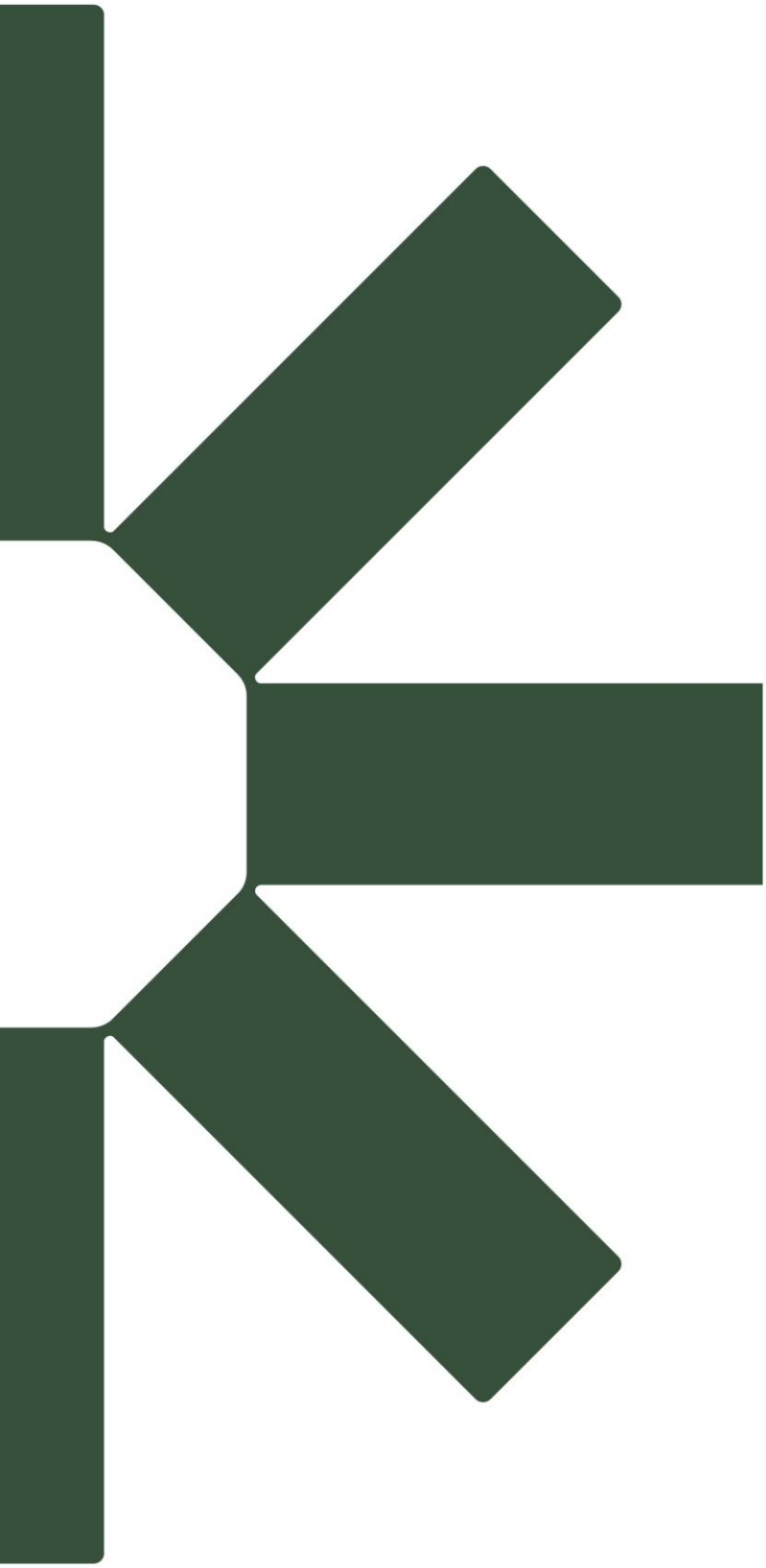
A qualitative assessment of the potential dust impacts during the construction of the development has been undertaken following IAQM guidance. Providing effective mitigation measures are implemented, such as those outlined in Section 7.1 of this report, residual effects from dust emissions arising during the construction phase are considered to be 'not significant'.

Given the short-term nature of the construction phase, there is predicted to be an insignificant effect on air quality from construction-generated vehicle emissions.

8.2 Operational Phase

The Proposed Development is expected to generate road traffic volumes below the relevant indicative EPIC & IAQM screening criteria. As such, the operational effects on local air quality arising from road traffic emissions associated with the Proposed Development can be considered 'insignificant'.

A qualitative site suitability assessment has been undertaken following EPIC & IAQM guidance, with reference to publicly available air quality datasets. Effects associated with likely exposure of future occupants of the Proposed Development are considered to be 'not significant'.



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