

Proposed Residential Units at 10
Shinfield Road, Reading
AIR QUALITY TECHNICAL NOTE

June 2025

PROPOSED RESIDENTIAL UNITS AT 10 SHINFIELD ROAD, READING

Air Quality Technical Note

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1. INTRODUCTION

- 1.1.1. IAQS was commissioned by Kennet Investments Ltd (the Applicant) to undertake an air quality assessment to support a planning application for a proposed residential redevelopment of land at 10 Shinfield Road (the 'Application Site').
- 1.1.2. The proposals will comprise the retention of the existing property, with the addition of side, rear and front extensions along with a second storey above, to create two six-bed houses of multiple occupation (HMOs). A total of three car park spaces will be provided, with a secure cycle store and landscaped / amenity areas proposed. The proposals are referred to as the 'Proposed Development' herein.
- 1.1.3. The Proposed Development layout relative to Shinfield Road is presented in **Figure 1**.

1.2. NEED FOR ASSESSMENT

- 1.2.1. This technical note provides an assessment of the suitability of the Application Site for residential use within the context of baseline air quality conditions. This will ensure that future residents of the Proposed Development are not exposed to levels of air pollution above relevant health-based national standards.
- 1.2.2. This assessment is undertaken with reference to current technical guidance published by the Department of Environment Food and Rural Affairs (Defra)¹ and the Institute of Air Quality Management (IAQM)² within the context of relevant health-based national air quality objectives.
- 1.2.3. The works required to construct the Proposed Development comprise an additional storey along with side, rear and front extensions to the retained building, landscaping works, and predominantly internal works. As such, the Proposed Development construction will present a negligible risk of adverse air quality (dust) impact during construction. Standard good practice site management and dust suppression measures (e.g. watering; use of barriers/sheeting) should be utilised during external works to minimise any potential dust risk. Therefore, a detailed construction dust risk assessment has been scoped out on this basis.
- 1.2.4. In addition, the Proposed Development will not materially impact existing traffic movements on the adjacent Shinfield Road. Whilst three car park spaces are included in the Proposed Development, the existing property at the Application Site accommodates three car parking spaces. Therefore, there will be no net change in traffic on the local network. As such, vehicle emissions generated by the Proposed Development will have no material impact on local air quality and further assessment is scoped out in line with IAQM guidance².

¹ Defra (2022) *Local Air Quality Management Technical Guidance*

² Institute of Air Quality management (2017) *Land-Use Planning & Development Control: Planning For Air Quality*





Figure 1: Proposed Development Plan





2. LEGISLATION & POLICY CONTEXT

2.1. AIR QUALITY LEGISLATIVE CONTEXT

- 2.1.1. The *European Directive on Ambient Air Quality* (2008/50/EC) set legally binding limits for ambient concentrations of air pollutants that impact public health such as NO₂, PM₁₀, and PM_{2.5}. The Directive and associated pollutant limit values were transposed into the UK law under the *Air Quality Standards Regulations 2010* and, following the UK's exit from the EU, the *Environment (Legislative Functions from Directives) (EU Exit) Regulations 2019*.
- 2.1.2. The UK's Air Quality Strategy³ established the framework for air quality improvements across the UK. The Strategy sets out standards for key air pollutants that reflect levels of pollutants thought to avoid or minimise risks to health or ecosystems. The associated air quality objectives are policy targets, expressed as maximum permissible outdoor concentrations of pollutants that take account of economic efficiency, practicability, technical feasibility and timescales.
- 2.1.3. The national air quality objectives for the aforementioned key pollutants considered in this assessment are enacted by the *Air Quality (England) Regulations 2000*. The national objectives are numerically identical to the European limit values, with the exception of PM_{2.5}. With respect to PM_{2.5}, the limit value was amended (reduced from 25 µg/m³ to 20 µg/m³) in 2020 by *The Environment (Miscellaneous Amendments and Revocations) (EU Exit) Regulations 2020*.
- 2.1.4. Following the departure of the UK from the EU, the *Environment Act 2021* makes provision for targets, plans, and policies to improve the natural environment, including air quality. Long-term targets have been set within the first *Environmental Improvement Plan 2023* (EIP)⁴ pursuant to Section 10(6) of the Act. These legal targets specifically relate to PM_{2.5} and have been transposed into law via *The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023*:
- Annual Mean Concentration Target – a maximum concentration of 10 µg/m³ to be met across England by 2040
 - Population Exposure Reduction Target – a 35% reduction in population exposure by 2040 (compared to a base year of 2018)
- 2.1.5. Defra has published interim planning guidance⁵ on how these targets should be applied in decision making. This assessment has considered the interim guidance and has also been completed within the context of the annual mean air quality standard for PM_{2.5} (20 µg/m³), as stated above.

³ Defra (2007) *The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1)*

⁴ HM Government *Environmental Improvement Plan 2023*. Available at: <https://www.gov.uk/government/publications/environmental-improvement-plan>

⁵ Defra (4 Oct 2024) *PM_{2.5} Targets: Interim Planning Guidance*. Available at: <https://uk-air.defra.gov.uk/pm25targets/planning>



- 2.1.6. An overview of the national air quality objectives for the aforementioned key pollutants relative to this assessment is presented in **Table 1**.

Table 1: National health-based air quality objectives / targets relevant to assessment

Pollutant	Averaging Period	Objective / Target Concentration ($\mu\text{g}/\text{m}^3$)	Number of permitted exceedances per calendar year	Date to be achieved by
NO ₂	Annual	40	-	December 2005
	1-Hour	200	18	December 2005
PM ₁₀	Annual	40	-	December 2004
	24-Hour	50	35	December 2004
PM _{2.5}	Annual	20	-	January 2020
	Annual	10	-	December 2040

2.2. PLANNING POLICY CONTEXT

Reading Borough Council Local Plan 2019

- 2.2.1. The relevant elements of Policy EN15 – Air Quality within the Local Plan 2019⁶ state:

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

- 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...”*

- 2.2.2. Given that the Application Site is located within an Air Quality Management Area (AQMA), this technical note focusses on assessing the potential for exposure of future occupants of the Proposed Development to elevated levels of air pollution. If the assessment demonstrates that there is the potential for detrimental effects on future occupants, appropriate mitigation measures will be proposed.

⁶ Reading Borough Council (2019) *Reading Borough Local Plan: Adopted November 2019* (Accessed via: https://images.reading.gov.uk/2019/12/Local_Plan_Adopted_November_2019.pdf)



3. BASELINE AIR QUALITY REVIEW

3.1. LOCAL AIR QUALITY MANAGEMENT

- 3.1.1. The Reading AQMA encompasses all the major arterial roads in and out of the town as well as the central area, including the Application Site. The AQMA was designated due to monitored exceedances of the annual mean NO₂ objective, primarily attributed to road traffic emissions.
- 3.1.2. The 2024 Air Quality Annual Status Report (ASR) published by RBC⁷ confirms that, in 2023, no continuous air quality monitoring site was reported to exceed any of the NO₂, PM₁₀, and PM_{2.5} health-based objectives. Furthermore, only one diffusion tube at Malcolm Place exceeded the annual mean NO₂ objective in 2022 (42.6 µg/m³). This monitoring site is located adjacent to the Inner Distribution Road (IDR), a dual carriageway, some 2.5 km to the northwest of the Application Site and not considered representative of exposure at the Proposed Development.
- 3.1.3. Whilst the 2024 ASR reports that the majority of the AQMA does not exceed national objective levels, there is no intention to revoke the AQMA, given that there are still hotspot areas where exceedances can and do occur (e.g. Malcolm Place, IDR).

3.2. AIR QUALITY MONITORING NEAR TO THE APPLICATION SITE

- 3.2.1. RBC undertakes automatic real-time air quality monitoring of NO₂ and PM₁₀ at three roadside sites within the AQMA (Caversham Road, Oxford Road, London Road), as well as passive diffusion tube monitoring of NO₂ at 57 sites. In addition, an urban background automatic real-time monitoring site is operated for Defra as part of the Automatic Urban and Rural Network (AURN) and monitors NO₂, PM₁₀, and PM_{2.5}.
- 3.2.2. Of the above sites, there are three roadside diffusion tubes located within 250 m, including one within 100 m of the Application Site. However, these monitoring sites were only introduced by RBC in 2023, such that there is only a single year of data available. The annual mean NO₂ monitoring results recorded at these sites for 2023, as published in the 2024 ASR, are presented in **Table 2**.
- 3.2.3. The AURN site is located approximately 1.4 km to the northeast of the Application Site, with data relating to PM₁₀ and PM_{2.5} obtained from this monitoring site for years 2019-2023 to provide indicative ambient particulate levels.

⁷ Reading Borough Council (2024) 2024 Air Quality Annual Status Report



Table 2: Annual mean NO₂, PM₁₀, and PM_{2.5} monitoring results based on RBC data for period 2019 – 2024 in proximity to the Application Site

Site ID	Location (Type)	In AQMA?	Distance to Site (m)	Annual Mean Concentration (µg/m³)				
				2019	2020	2021	2022	2023
Nitrogen dioxide, NO ₂								
RD051	Marlborough House, Christchurch Road (Roadside)	Yes	80	-	-	-	-	18.1
RD044	Christchurch Road (Roadside)	Yes	150	-	-	-	-	22.8
RD025	42 Shinfield Road (Kerbside)	Yes	205	-	-	-	-	15.5
Reading AURN*	Reading Newtown (Urban Background)	No	1,400	22^	15	20	22^	13
Particulate matter, PM ₁₀								
Reading AURN*	Reading Newtown (Urban Background)	No	1,400	13	15	15	16	12
Particulate matter, PM _{2.5}								
Reading AURN*	Reading Newtown (Urban Background)	No	1,400	8	8	8	8	7
Notes:								
* Automatic monitoring site								
^ NO ₂ 1-hour mean objective (18 allowed exceedances) was exceeded in 2019 and 2022; PM ₁₀ 24-hour mean objective (35 allowed exceedances) was not exceeded in any year within reported period.								

- 3.2.4. The monitoring results presented in **Table 2** demonstrate that the annual mean objective for each pollutant have not been exceeded at any location within proximity to the Application Site over the reported period.
- 3.2.5. The nearest monitoring site to the Application Site is RD051, which is a roadside diffusion tube located approximately 80 m to the northwest. The monitored NO₂ annual mean in 2023 at this location (18.1 µg/m³) was well below the annual mean NO₂ objective (40 µg/m³). Given the location of this diffusion tube, the reported NO₂ level at Marlborough House, Christchurch Road is the representative of baseline conditions at the Application Site.
- 3.2.6. The reported annual mean PM₁₀ and PM_{2.5} concentrations at the AURN automatic site were demonstrably below the respective annual mean air quality objectives over the five-year period, with the PM_{2.5} concentrations also below the new long-term target concentration (10 µg/m³). Given that the Proposed Development façade is some 14 m away from the adjacent Shinfield Road, which is the principal source of pollutant emissions, exposure of future residents to PM_{2.5} should be at levels comparable to the AURN site (urban background) i.e. below the target.



3.3. BACKGROUND AIR POLLUTANT CONCENTRATIONS

- 3.3.1. Background annual mean NO₂, PM₁₀, and PM_{2.5} pollutant concentrations corresponding to the 1 km x 1 km grid squares covering the Application Site were obtained from Defra's national pollutant mapping data⁸. Background concentrations for 2025 and 2030 to represent current and future baseline air quality conditions at the Application Site. These data are presented in **Table 3**.

Table 3: Defra background annual mean NO₂, PM₁₀, and PM_{2.5} concentrations for the 1 km x 1 km grid square encompassing the Application Site

OS Grid Square (m)	Annual Mean NO ₂ (µg/m ³)		Annual Mean PM ₁₀ (µg/m ³)		Annual Mean PM _{2.5} (µg/m ³)	
	2025	2030	2025	2030	2025	2030
472500, 172500	11.9	10.4	12.5	12.1	7.8	7.4
Objective (µg/m ³)	40		40		20	

- 3.3.2. Annual mean background concentrations the years presented in **Table 3** are predicted to be well below the respective air quality objectives and, for PM_{2.5}, are projected to remain below the 2040 annual mean concentration target.

⁸ Defra Background Mapping Data for Local Authorities (2021-based); webpage accessed 13 June 2025: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>



4. ASSESSMENT OF SUITABILITY FOR RESIDENTIAL USE

- 4.1.1. The Proposed Development will introduce new sensitive receptors (human health) to the Application Site and thus the suitability of the site for the proposed end use needs to be assessed with respect to current and future levels of air quality.
- 4.1.2. The review of baseline air quality within and near to the Application Site, as detailed in **Section 3**, demonstrated that levels of key air pollutants (NO₂, PM₁₀, PM_{2.5}) have remained below the respective health-based air quality objectives in recent years, with RBC's 2024 ASR and Defra modelled background mapped data indicating a decreasing trend in pollutant concentrations over the period reviewed.
- 4.1.3. Given that the Proposed Development façade is some 14 m away from the adjacent Shinfield Road – the principal source of pollutant emissions near to the Application Site – exposure of future residents to PM_{2.5} should be at levels comparable to the AURN site (urban background), which are demonstrably below the 2040 target (see Table 2 and **Table 3**). Therefore, the Proposed Development design inherently ensures that exposure to roadside sources of PM_{2.5} is reduced as far as possible.
- 4.1.4. Despite being within the Reading AQMA, as evidenced in **Table 2**, the closest roadside NO₂ monitoring location (RD-051) to the Application Site recorded an annual mean concentration well below the objective in 2023. This indicates that future occupants of the Proposed Development will not be exposed to elevated levels of NO₂.
- 4.1.5. Notwithstanding, Defra's *NO₂ Fall Off with Distance Calculator*⁹ has been used to predict the likely level of exposure of future occupants to annual mean NO₂ concentrations at the Proposed Development façade adjacent to Shinfield Road, which is the principal source of air pollutants (i.e. vehicle emissions) in relation to the Proposed Development. The calculator allows an annual mean NO₂ value to be calculated at a given distance from a road source (i.e. Proposed Development façade, which is 14 m from Shinfield Road), using the monitored value recorded at a different distance from the same road (i.e. diffusion tube at RD051 – Marlborough House, Christchurch Road).
- 4.1.6. The calculation was completed using the monitored 2023 annual mean NO₂ roadside concentration reported by RBC⁷. The respective calculator input parameters and results are presented in **Table 4** and assessed within the context of the national air quality objective for annual mean NO₂. The output was used to inform the overall appraisal of the suitability of the Application Site for residential land use.

⁹ Defra (2016) *NO₂ Fall Off with Distance Calculator v4.2*; Webpage accessed 18 June 2025: <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-falloff/>



Table 4: Predicted annual mean NO₂ concentrations at the Application Site façade adjacent to Shinfield Road based on Defra's *NO₂ Fall Off with Distance Calculator*

RBC Monitoring Site	Year	Distance (m)		Annual Mean NO ₂ Concentration (µg/m ³)		
		Monitoring Site to kerb	Proposed Development Façade to kerb	Background	Monitoring Site	Predicted at Site Boundary
RD051	2023	4.0	14.0	11.9	18.1	15.9
Annual Mean Objective (µg/m ³)				40		

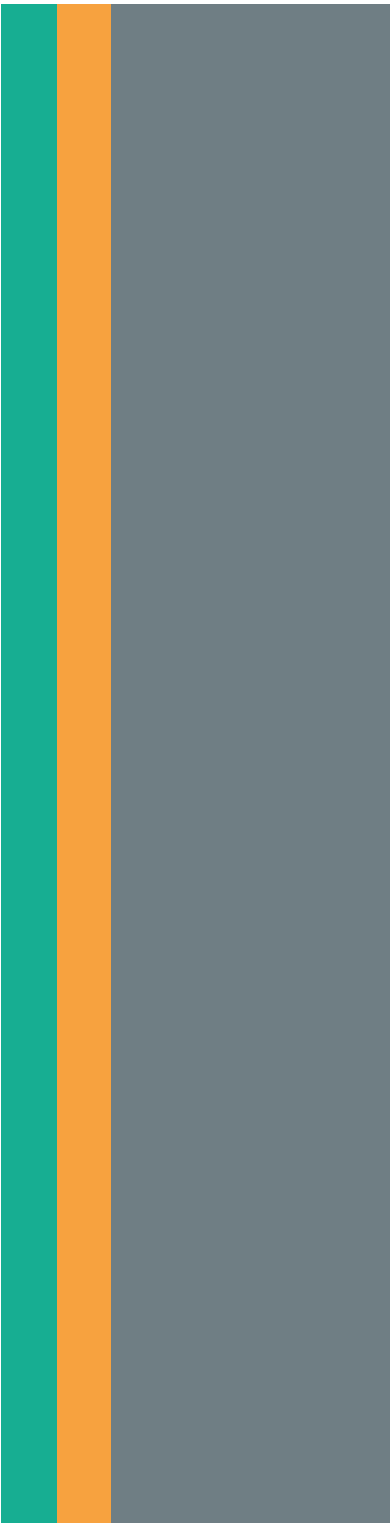
- 4.1.7. The results of the calculation confirm that current levels of annual mean NO₂ at the Application Site are expected to be well below the respective air quality objective and future occupants of the Proposed Development will not be exposed to poor air quality.
- 4.1.8. Based on the review of local air quality at and surrounding the Application Site, in addition to the outcomes of the NO₂ fall off with distance calculation, **the Application Site is suitable for the proposed residential land use**. As such, there is no requirement for mitigation measures specific to air quality.



5. CONCLUSIONS

- 5.1.1. This technical note presents the outcomes of a site suitability assessment for the Proposed Development within the context of local air quality. The Proposed Development comprises the retention of the existing property, with the addition of a second storey above, along with front, rear and side extensions, to create two six-bed HMOs. The Application Site is located within the Reading AQMA that was declared due to exceedances of the annual mean NO₂ health-based objective.
- 5.1.2. A review of the latest RBC monitoring data⁷ in proximity to the Application Site, in addition to Defra's background pollutant maps covering the Application Site, demonstrated that existing levels of NO₂, PM₁₀, and PM_{2.5} are below the respective health-based national air quality objectives. Furthermore, monitored annual mean levels of PM_{2.5} are below the recently legislated 2040 annual mean concentration target.
- 5.1.3. Given the scale and nature of the Proposed Development, a detailed construction dust risk assessment was scoped out of this study. However, standard good practice site management and construction dust suppression measures should be utilised during all external construction works, where appropriate.
- 5.1.4. The Proposed Development will not materially impact existing traffic movements on the adjacent Shinfield Road. Whilst three car park spaces are included in the Proposed Development, any traffic generated above that already associated with the existing residential property will be negligible. As such, vehicle emissions generated by the Proposed Development will have no material impact on local air quality and further assessment was scoped out.
- 5.1.5. As the Proposed Development will introduce new sensitive receptors within the AQMA, the suitability of the site for the proposed end use was assessed with respect to current and future air quality. Defra's *NO₂ Fall Off with Distance Calculator* was used to predict levels of annual mean NO₂ at the Application Site façade adjacent to Shinfield Road. The results of the calculation indicate that current and future levels of annual mean NO₂ at the Application Site will remain well below the respective air quality objective.
- 5.1.6. Furthermore, a review of current and future annual mean PM_{2.5} levels at the Application Site demonstrated that exposure of future residents to PM_{2.5} would be inherently reduced by the Proposed Development design. This is principally due to the setback distance of the proposed property façade from Shinfield Road – the principal source of pollutant emissions near to the Application Site. Current monitored levels of both PM₁₀ and PM_{2.5} reported by RBC, and representative of the Application Site, are below the respective annual mean objectives and the 2040 PM_{2.5} annual mean target.
- 5.1.7. As such, the **Application Site is considered suitable for residential land use** within the context of local air quality and there is no requirement for mitigation measures specific to air quality.
- 5.1.8. This report has demonstrated that the Proposed Development complies with relevant national and local air quality policy, with no air quality constraints identified with respect to progressing the development.





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