



**Preliminary Air Quality
Assessment:**
Farnham and Hildene
Road, London Borough of
Havering

May 2024



Experts in air quality
management & assessment

Document Control

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Contents

1	Introduction	2
2	Baseline Air Quality	6
3	Air Quality Assessment Considerations.....	9
4	Site Suitability.....	10
5	Air Quality Design Principles	11
6	Conclusions	12
7	References.....	13
8	Glossary	14
9	Appendices	15
A1	Professional Experience.....	16

Tables

Table 1:	Air Quality Criteria for NO ₂ , PM ₁₀ and PM _{2.5}	5
Table 2:	Summary of Annual Mean NO ₂ Monitoring (2017-2021) (µg/m ³)	7
Table 3:	LAEI Predicted Concentrations in 2025 and 2030	8

Figures

Figure 1:	Location of the Proposed Development.....	3
Figure 2:	Monitoring Locations	7

1 Introduction

Background

- 1.1 This report provides a preliminary air quality assessment, as required by the Greater London Authority's (GLA's) London Plan (GLA, 2021) and an overview of air quality matters related to a proposed residential development for input into an Environmental Impact Assessment (EIA) screening document. The proposed development is located on Farnham and Hildene Road, Romford, in the London Borough of Havering (LBH).
- 1.2 The proposed development will include the demolishing of the existing properties on the site and the construction of up to 500 new residential units and up to 7,000 m² of commercial space. The proposals include the provision of up to 300 parking spaces. The anticipated earliest year that the proposed development will be operational is 2028.
- 1.3 Policy SI 1 of the London Plan specifically states *"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"*.
- 1.4 This preliminary air quality assessment has been undertaken to identify any constraints to the proposed development in terms of air quality, and to allow for air quality design principles to be included within the design. It also identifies the main areas and the potential magnitudes of environmental impacts of the proposed scheme in relation to air pollution for input into an EIA screening document. This assessment includes:
 - the most significant sources of pollution in the area and baseline air quality;
 - the applicable air quality requirements for a planning application;
 - constraints imposed on the site by poor air quality; and
 - appropriate design measures that could be implemented to ensure that the proposed development reduces exposure and improves air quality.
- 1.5 The location of the proposed development is highlighted in Figure 1.

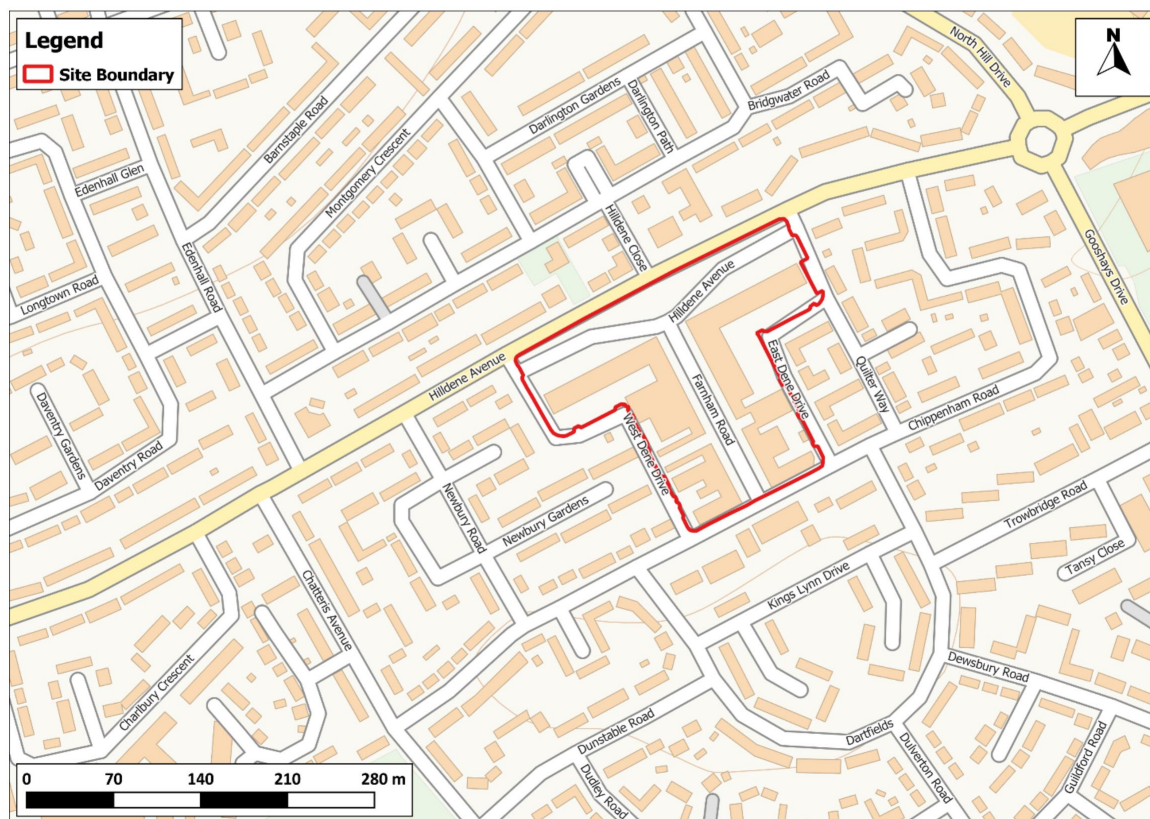


Figure 1: Location of the Proposed Development

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Assessment Criteria

- 1.6 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations (2002).
- 1.7 The UK-wide objectives for nitrogen dioxide (NO₂) and PM₁₀ were to have been achieved by 2005 and 2004 respectively and continue to apply in all future years thereafter. Measurements across the UK have shown that the 1-hour NO₂ objective is unlikely to be exceeded at roadside locations where the annual mean concentration is below 60 µg/m³ (Defra, 2022).

- 1.8 The objectives apply at locations where members of the public are likely to be regularly present and are likely to be exposed over the averaging period of the objective. The GLA explains where these objectives will apply in London (GLA, 2019a). The annual mean objectives for NO₂ and PM₁₀ are considered to apply at the façades of residential properties, schools, hospitals and care homes etc., the gardens of residential properties, school playgrounds and the grounds of hospitals and care homes. The 24-hour mean objective for PM₁₀ is considered to apply at the same locations as the annual mean objective, as well as at hotels. The 1-hour mean objective for NO₂ applies wherever members of the public might regularly spend 1-hour or more, including outdoor eating locations and pavements of busy shopping streets.
- 1.9 For PM_{2.5}, the objective set by Defra for local authorities is to work toward reducing concentrations without setting any specific numerical value. In the absence of a numerical objective, it is convention to assess local air quality impacts against the limit value, originally set at 25 µg/m³ and currently set at 20 µg/m³.
- 1.10 Defra has also recently set two new targets, and two new interim targets, for PM_{2.5} concentrations in England. One set of targets focuses on absolute concentrations. The long-term target is to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by the end of 2040, with the interim target being a value of 12 µg/m³ by the start of 2028¹. The second set of targets relate to reducing overall population exposure to PM_{2.5}. By the end of 2040, overall population exposure to PM_{2.5} should be reduced by 35% compared with 2018 levels, with the interim target being a reduction of 22% by the start of 2028.
- 1.11 Defra will assess compliance with the population exposure targets by averaging concentrations measured at its own background monitoring stations. This will not consider small changes over time to precisely where people are exposed (such as would relate to exposure introduced by a new development). Furthermore, all four new targets provide metrics against which central Government can assess its own progress. While local authorities have an important role delivering the required improvements, these are expected to relate to controlling emissions and not to directly assessing PM_{2.5} concentrations against the targets.
- 1.12 In March 2023, the Department for Levelling Up, Housing and Communities (DLUHC, 2023) explained that the new PM_{2.5} targets will:
- “need to be integrated into the planning system, and in setting out planning guidance for local authorities and businesses, we will consider the specific characteristics of PM_{2.5}. The guidance will be forthcoming in due course, until then we expect local authorities to continue to assess local air quality impacts in accordance with existing guidance.”*

¹ Meaning that it will be assessed using measurements from 2027. The 2040 target will be assessed using measurements from 2040. National targets are assessed against concentrations expressed to the nearest whole number, for example a concentration of 10.4 µg/m³ would not exceed the 10 µg/m³ target.

- 1.13 Defra has also provided advice (Defra, 2023b) which explains that there is no current requirement to consider the new PM_{2.5} targets in planning decisions and that guidance to local planning authorities will be forthcoming before this position changes. In the future, when planning decisions do need to consider the new targets, the expectation is that this will focus on reducing emissions from new development rather than there being a direct requirement for planning-related air quality assessments to predict PM_{2.5} concentrations.
- 1.14 For the time being, therefore, no assessment is required, and indeed no robust assessment is possible, in relation to the new PM_{2.5} targets and they are not considered further.
- 1.15 The GLA has also set a target to achieve an annual mean PM_{2.5} concentration of 10 µg/m³ by 2030. This target was derived from an air quality guideline set by the World Health Organisation (WHO) in 2005. The GLA target is not currently in UK regulations and there is no explicit requirement to assess against it. However, achievement of the guideline is a long-term aspiration of the UK Government (Defra, 2019), and the London Environment Strategy (GLA, 2018) sets out what the Mayor will do to help achieve the ambitions in the strategy.
- 1.16 The relevant air quality criteria for this assessment are provided in Table 1.

Table 1: Air Quality Criteria for NO₂, PM₁₀ and PM_{2.5}

Pollutant	Time Period	Objective
NO ₂	1-hour Mean	200 µg/m ³ not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m ³
PM ₁₀	24-hour Mean	50 µg/m ³ not to be exceeded more than 35 times a year
	Annual Mean	40 µg/m ³
PM _{2.5}	Annual Mean	20 µg/m ³ ^a
	Annual Mean	10 µg/m ³ by 2030

^a There is no numerical PM_{2.5} objective for local authorities. Convention is to assess against the UK limit value which is currently 20 µg/m³.

2 Baseline Air Quality

- 2.1 The Site is located approximately 4.3 km northeast of Romford Town Centre. The application site is bounded by Chippenham Road to the south, East and West Dene Drive to the east and west, respectively, and Hildene Avenue to the north. The site is surrounded by residential and commercial properties.
- 2.2 LBH has investigated air quality within its area as part of its responsibilities under the Local Air Quality Management (LAQM) regime. In July 2006, LBH declared a borough-wide Air Quality Management Area (AQMA) for exceedances of the annual mean nitrogen dioxide (NO₂) and 24-hour mean particulate matter (PM₁₀) objectives, and the Site is located within this AQMA.

Industrial Sources

- 2.3 A search of the UK Pollutant Release and Transfer Register website (Defra, 2023a) has not identified any significant industrial or waste management sources that are likely to affect the proposed development, in terms of air quality.

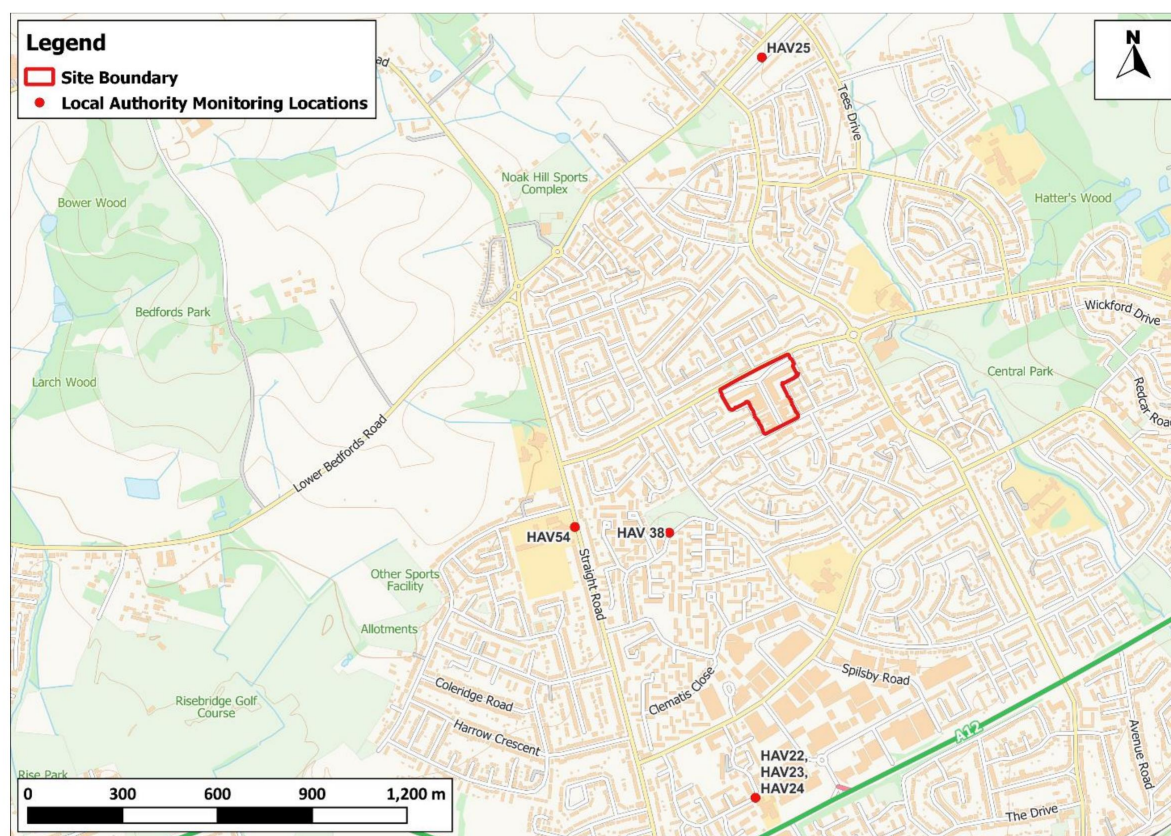
Local Air Quality Monitoring

- 2.4 LBH operates two automatic monitoring stations within its area; however, neither of these are located within the study area (being located over 2 km away). LBH also operates a number of nitrogen dioxide monitoring sites using diffusion tubes prepared and analysed by SOCOTEC (using the 50% TEA in acetone method). These include; one 430 m southwest of the site (HAV 38), one on Straight Road (HAV 54) approximately 620 m southwest of the site, one on Wincanton Road (HAV 25) approximately 940 m north, and three co-located on Neave Crescent (HAV 22,23,24) approximately, 1.1 km south of the site.
- 2.5 The latest monitoring data for the above sites (taken from LBH's 2022 Annual Status Report (ASR) (London Borough of Havering, 2022)) are summarised in Table 2 and the monitoring locations are shown in Figure 2.

Table 2: Summary of Annual Mean NO₂ Monitoring (2017-2021) (µg/m³)

Site No.	Site Type	Location	2017	2018	2019	2020	2021
HAV 22,23,24^a	Urban Background	Ravensbourne School	30.4	25.3	24.5	16.6	19.9
HAV25	Urban Background	Wincanton Road	26.6	22.1	20.8	19.7	18.4
HAV38	Roadside	Myrtle Road	25.3	22.2	21.0	20.5	16.4
HAV54	Roadside	Hilldene Infant School	-	-	-	21.4	22.0
Objective			40				

^a Average of triplicate diffusion tubes.

**Figure 2: Monitoring Locations**

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2.6 As shown in Table 2, no exceedances of the annual mean nitrogen dioxide objective were observed at nearby LBH monitoring sites between 2017 and 2021. The overall trend shows that measured

concentrations across all sites have decreased from 2017 to 2021, assisted by the impacts caused by the COVID-19 pandemic.

- 2.7 As locally monitored NO₂ concentrations in the area are below 60 µg/m³, this indicates that exceedances of the 1-hour mean objective is unlikely.
- 2.8 While 2020 and 2021 results have been presented for completeness, they will not be relied upon in any way as they are not representative of 'typical' air quality conditions due to the impact of the COVID-19 pandemic on traffic volumes and, thus, pollutant concentrations. However, 2019 concentrations, pre-pandemic, were below the annual mean air quality objective. Future data is needed to confirm that concentrations are continuing to decline since 2019; however, data from across the whole country indicates the majority of roadside and urban locations in the UK are unlikely to exceed those seen during 2019 at any point in the foreseeable future (Air Quality Consultants, 2023).

LAEI Mapped Concentrations

- 2.9 In addition to the locally measured concentrations discussed above, the maximum pollutant concentrations predicted across the site in 2025 and 2030 have been determined from the London Atmospheric Emissions Inventory (LAEI) database produced by the GLA (2023). These are presented in Table 3. These predicted concentrations cover the whole of the GLA area at 20m grid resolution.
- 2.10 The worst-case predicted annual mean concentrations for NO₂, PM₁₀ and PM_{2.5} in 2025 and 2030 within the proposed development are all below the annual mean objectives (see Table 3). The predicted PM_{2.5} concentrations at the facades of the buildings in the proposed development in 2025 also meet the GLA target of 10 µg/m³.
- 2.11 As the earliest occupation of the development is 2028, there can be confidence that users of the proposed development will experience acceptable air quality.

Table 3: LAEI Predicted Concentrations in 2025 and 2030

Year	NO ₂	PM ₁₀	PM _{2.5}
2025	17.3	16.7	9.5
2030	12.3	15.6	8.6
Objectives	40	40	20 (10) ^a

^a The 20 µg/m³ PM_{2.5} objective, which was to be met by 2020, is not in Regulations and there is no requirement for local authorities to meet it. 10 µg/m³ is the GLA target for annual mean PM_{2.5} and again there is no requirement for local authorities to meet this.

3 Air Quality Assessment Considerations

- 3.1 The current site consists of 117 homes and a pay and display car park comprising approximately 248 spaces and 104 permit holder residential car parking spaces, totalling 352 parking spaces. The proposals include up to 300 parking spaces, including for residential and retail spaces. Trip generation analysis undertaken by WSP for the site shows the proposed development will result in a net increase of 208 AADT trips. This increase in vehicle trips is above the IAQM's screening thresholds for detailed modelling within an AQMA, contained within the IAQM's Land-Use Planning & Development Control: Planning For Air Quality guidance (Moorcroft and Barrowcliffe et al, 2017). However, depending on the maximum distribution of trips on a single road, and when considering local air quality concentrations are below 90% of the annual mean NO₂ objective (see Table 2), where IAQM guidance states the higher (500 AADT) screening threshold can be applied, detailed modelling may not be required. However, the type of assessment required will be confirmed with the EHO when detailed traffic data is available.
- 3.2 It is expected that the proposed development will not include any combustion plant (such as gas-fired CHPs or boilers etc.) for heating/hot water generation. As such, no assessment will be required. However, if the proposed development includes any backup emergency diesel generators, these will need assessment for their impacts on the proposed residents of the development and nearby sensitive receptors, even for their routine testing regime.
- 3.3 Furthermore, any assessment will also identify whether the development is air quality neutral, to meet the requirements of policy SI 1 of the London Plan and, if not, the extent to which mitigation/off-setting is required. In addition, an air quality and dust risk assessment of construction and demolition activities, as required by policy SI 1 of the London Plan, will be required.

4 Site Suitability

- 4.1 As shown in Table 2, measured annual mean NO₂ concentrations at LBH monitoring sites closest to the proposed development have been below the annual objective since 2017. Furthermore, LAEI maps show concentrations of NO₂, PM₁₀ and PM_{2.5} at the proposed development will be below the air quality objectives by 2025. This is also the case for the GLA's aspiration PM_{2.5} target of 10 µg/m³. As such, the baseline section confirms that air quality at the site is good: future occupants can be expected to experience acceptable air quality.
- 4.2 Best practice design methods are set out in Section 5 to mitigate the impacts of emissions from road traffic on future occupiers of the proposed development.

5 Air Quality Design Principles

5.1 The following design principles to reduce exposure to air pollution and improve air quality should be considered to be incorporated within the design of the proposed development (if not already included):

- access to public transport options should be maximised, as well as access to cycle and walking routes;
- electric vehicle charging provision in line with or better than the London Plan requirements;
- cycle storage facilities should be provided at locations that are easy to access and are close to cycle routes both within and outside of the proposed development, and showers / changing facilities for commercial uses to enable staff to cycle to work, where applicable; and
- incorporating the Healthy Streets Approach into the scheme to reduce the need to travel, or to promote sustainable transport opportunities.
- boundary planting along the proposed development boundaries adjacent to roads and industrial sources, taking account of the GLA's guide to using green infrastructure to protect people from air pollution (GLA, 2019b);
- ensuring that any ventilation air intakes, where proposed, are located as far away as possible from sources of air pollution or odour; and
- increasing the set-back distance of proposed buildings from the adjacent roads as far as practically possible, to reduce exposure to emissions, and use of building form and distribution to promote dispersion.

6 Conclusions

- 6.1 The proposed development is located within the borough-wide Havering AQMA and introduces new residential exposure into this area. Baseline conditions show pollutant concentrations in the vicinity of the proposed development have been below the respective annual and 1-hour mean NO₂ objectives since 2017; therefore, concentrations at the proposed development site are expected to also be below the objectives. Modelled LAEI NO₂, PM₁₀ and PM_{2.5} concentrations also indicate that concentrations at the site are below the respective objectives. The predicted PM_{2.5} concentrations at the facades of the buildings in the proposed development in 2025 also meet the GLA target of 10 µg/m³. It is, therefore, expected that future users will experience acceptable air quality in the anticipated year of opening (2028), but this will be confirmed within the Air Quality Assessment.
- 6.2 The proposed development will generate an additional 208 AADT on the local road network. This is above the 100 AADT IAQM screening threshold. However, depending on the distribution of the trips, the maximum number of trips on a single road may be considerably less than 208 AADT. When further considering the local roadside air quality concentrations being well below the objectives, a detailed assessment may not be required. However, the type of assessment required will be confirmed with the local EHO when detailed traffic data is available.
- 6.3 Based on the above, it is proposed that the air quality impacts of the proposed development be screened out of EIA, with a standalone air quality assessment suitable for the size and likely impacts of the development, regardless, of whether detailed modelling is required.
- 6.4 Furthermore, a list of design principles to reduce exposure to air pollution has been provided, which should be considered and incorporated within the design of the proposed development.

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8 Glossary

AQC	Air Quality Consultants
AQMA	Air Quality Management Area
Exceedance	A period of time when the concentration of a pollutant is greater than the appropriate air quality objective. This applies to specified locations with relevant exposure
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
µg/m³	Microgrammes per cubic metre
NO₂	Nitrogen dioxide
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides
PM₁₀	Small airborne particles, more specifically particulate matter less than 10 micrometres in aerodynamic diameter
PM_{2.5}	Small airborne particles less than 2.5 micrometres in aerodynamic diameter
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal
TEA	Triethanolamine – used to absorb nitrogen dioxide
WHO	World Health Organisation

9 Appendices

A1 Professional Experience..... 16

A1 Professional Experience

Penny Wilson, BSc (Hons) CSci MEnvSc MIAQM

Ms Wilson is a Technical Director with AQC, with more than 20 years' relevant experience in the field of air quality. She has been responsible for numerous assessments for a range of infrastructure developments including power stations, road schemes, ports, airports and residential/commercial developments. The assessments have covered operational and construction impacts, including dust and odour nuisance. She also provides services to local authorities in support of their LAQM duties, including the preparation of Review and Assessment and Action Plan reports, as well as audits of Air Quality Assessments submitted with planning and DCO applications. She has provided expert evidence to a number of Public Inquiries and civil court, and is a Member of the Institute of Air Quality Management and a Chartered Scientist.

Adam Dawson, BSc (Hons) MSc MEnvSc MIAQM

Mr Dawson is a Principal Consultant with AQC with over nine years' experience in the field of air quality assessment. He undertakes air quality and odour assessments for AQC, covering residential and commercial developments, industrial installations, energy centres and waste facilities. He has experience using a range of dispersion models including ADMS-Roads, ADMS-5 and Breeze AERMOD to complete quantitative modelling assessments, for both planning and permitting purposes. He previously spent over two years as part of the Environment Agency's permitting team, so has extensive experience of the permitting process and industrial emissions. He is a Member of the Institute of Air Quality Management and a Member of the Institution of Environmental Sciences.

Faye Wilder, BSc (Hons) MSc

Miss Wilder is an Assistant Consultant with AQC and joined the company in 2023. During her BSc Geography degree at the University of Birmingham, she developed an interest in air quality, which continued into her MSc in Environmental Management at the University of Reading. Her master's thesis investigated personal air pollution exposure across microenvironments using wearable air pollution sensors, and how this varied from fixed air pollution monitoring stations.