

AIR QUALITY ASSESSMENT

on behalf of

LANDA SONS LTD

for

**65 BRIDGE STREET, MANCHESTER M3
3QB**

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Summary

This air quality report has been prepared to discharge condition 3 of planning application 131395/FO/2021. The proposed development is for residential use and is located at 65 Bridge Street, Manchester M3 3QB. It assesses the potential changes in air quality due to the operation of the proposed development and whether these potential changes would significantly alter air quality as well as the suitability of the site for residential use.

Concentrations of NO₂ and PM₁₀ are likely to be below their respective long and short-term objectives at the residential dwellings within the proposed development site. Concentrations of PM_{2.5} are expected to be below the annual mean target.

The proposed development is not expected to have a significant impact on local air quality.

Therefore, we see no reason for condition 3 not to be discharged.

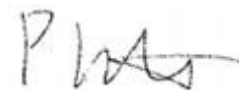
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Reviewed By Philip Walton

Signed


19 November 2021

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1 Introduction

1.1 Miller Goodall Ltd has been instructed to prepare an air quality assessment to discharge condition 3 of planning application 131395/FO/2021. This planning application is for a proposed residential development at 65 Bridge Street, Manchester M3 3QB. The site lies within the administrative boundary of Manchester City Council (MCC).

1.2 Condition 3:

“a) Prior to commencement of the development mitigation measures to safeguard local air quality shall be submitted to and approved in writing by the City Council as local planning authority.

b) Prior to occupation of the development any agreed mitigation measures shall be implemented and verified as such in writing by the City Council as local planning authority and shall remain in situ whilst the use or development is in operation.

Reason: To secure a reduction in air pollution from traffic or other sources in order to protect existing and future residents from air pollution, pursuant to policies EN16, SP1 and DM1 of the Core Strategy”

1.3 The report provides a review of the existing air quality in proximity to the proposed development site and assesses the potential impact of the proposed development on local air quality following Local Air Quality Management Technical Guidance¹ and EPUK and IAQM guidance².

1.4 The report provides an assessment of the potential air quality impacts associated with the operational phase of the proposed development. The suitability of the site for the intended use is also assessed.

1.5 The main pollutants of health concern from road traffic exhaust releases are nitrogen dioxide (NO₂) and fine particulates, normally assessed as the fraction of airborne particles of mean aerodynamic diameter less than ten micrometres (PM₁₀) and 2.5 micrometres (PM_{2.5}) since these pollutants are most likely to approach their respective air quality objectives in proximity to major roads and congested areas. This assessment has therefore focused on the impact of the proposed development on concentrations of NO₂, PM₁₀ and PM_{2.5}.

2 Site Description

2.1 The site is located within Manchester city centre in an area predominantly comprising of retail shops, hospitality, community buildings and residential dwellings.

2.2 Back Bridge Street runs along the northern site boundary and Bridge Street runs along the southern site boundary. To the east and west of the site, there are commercial premises on the ground floor of the surrounding buildings with residential dwellings on the upper floors. The site location is shown in **Appendix A**.

¹ Department for the Environment Food and Rural Affairs (2018) 'Local Air Quality Management Technical Guidance Document LAQM.TG (16)', London: Defra.

² EPUK and IAQM (January 2017) Land Use Planning and Development Control: Planning for Air Quality (v1.2)

3 Proposed Development

- 3.1 The proposed development is for the conversion of the existing 5-bedroom residential unit on the first- and second-floor into four self-contained 1-bedroom apartments, whilst retaining the existing commercial use on the ground floor.
- 3.2 There are no car parking spaces associated with the development.

4 Policy Context

4.1 Air Quality Objectives

- 4.1.1 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance.
- 4.1.2 The United Kingdom left the European Union on 31st January 2020 and is no longer a member state. However, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018^[3].
- 4.1.3 The relevant air quality standards and objectives are presented in **Table 1**. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health.

Table 1: Air Quality Strategy Objectives (England) for the Purposes of Local Air Quality Management

Pollutant	Air Quality Objective	
	Concentration	Measured As
Nitrogen dioxide (NO ₂)	200 µg/m ³	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m ³	Annual mean
Particles (PM ₁₀)	50 µg/m ³	24-hour mean not to be exceeded more than 35 per year
	40 µg/m ³	Annual mean
Particles (PM _{2.5})	25 µg/m ³	Annual mean (target)

- 4.1.4 Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as Air Quality Management Areas (AQMA) and take action to work towards meeting the

³ UK Parliament (2018): <http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted>

objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air quality locally.

- 4.1.5 Possible exceedances of air quality objectives are generally assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

4.2 Greater Manchester Action Plan 2016-2021

- 4.2.1 The Greater Manchester Combined Authority (GMCA) Air Quality Action Plan 2016-2021⁴ provides information in respect of the actions planned by the Greater Manchester Authorities in relation to declared AQMAs. Action Plans are the mechanism by which the local authorities, in collaboration with national agencies and others, outline their plans for working towards achieving the air quality objectives through the powers available to them. In relation to managing new development, the action plan states that:

“Action 1.1

Greater Manchester (GM)councils to adopt the most recent IAQM Guidance on the Assessment of Dust from Demolition and Construction as current best practice to assess and mitigate emissions from construction sites. i. Where a key priority area is affected by a proposed scheme, a high level of mitigation control will be requested.

Action 1.2

GM local authorities will adopt the most recent IAQM/EPUK guidance for air quality assessment as current best practice, to help ensure that planning applications consider potential local air quality impacts and opportunities to improve air quality are realised. i. Where a Key Priority Area is significantly adversely affected by a proposed scheme, a high level of mitigation control will be requested. ii. The IAQM/EPUK guidance will also be used to screen and assess industrial sources, such as boilers or large stationary engines. GM local authorities to recommend mitigation controls in accordance with the most recent guidance and the other actions in this document for new developments that contribute to a deterioration of air quality in Air Quality Management Areas (AQMAs). Where an air quality assessment is triggered, it should include a review of monitoring data. Where monitoring is not currently undertaken, it may be requested to inform the application or to confirm the effects.”

5 Methodology

5.1 Data Sources

- 5.1.1 The air quality assessment has been undertaken and prepared with reference to information from several sources, as detailed in **Table 2**.

⁴ GMCA (2016) Greater Manchester Air Quality Action Plan 2016-2021

Table 2: Key Information Sources

Data Source	Reference
Greater Manchester Combined Authority (GMCA)	GMCA (2016) <i>Greater Manchester Air Quality Action Plan 2016-2021</i> GMCA (2021) <i>2020 Air Quality Annual Status Report</i>
Department for Environment Food and Rural Affairs (Defra)	Defra <i>Local Air Quality Management Technical Guidance TG(16)</i> , February 2018
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (January 2017) <i>Land Use Planning and Development Control: Planning for Air Quality (v1.2)</i>
Ministry of Housing, Communities & Local Government	Planning Practice Guidance: Air Quality, November 2019 National Planning Policy Framework (NPPF), June 2019
Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps
Transport for Greater Manchester (TfGM)	TfGM (2014) TfGM 2016 modelling screenshot

5.2 Simple Air Quality Assessment

- 5.2.1 A simple assessment of air quality in terms of the impact of the development and suitability of the site, which relies on already published information, has been completed using sources such as the Local Authority's monitoring network and the Defra LAQM support tools.

6 Baseline Air Quality

6.1 Local Air Quality

- 6.1.1 Baseline air quality at the proposed development has been established by examining monitoring data produced by GMCA (provided in the GMCA (2021) 2020 Annual Status Report)⁵ and background concentration maps provided by Defra for the grid squares covering the proposed development.
- 6.1.2 The site is located within an AQMA. The site location and its relationship to the AQMA is shown in **Appendix A**. The AQMA was declared in 2016, on the basis of annual average levels of NO₂⁵.

⁵ GMCA (2021) 2020 Air Quality Annual Status Report

6.2 Air Quality Monitoring

Nitrogen Dioxide (NO₂)

- 6.2.1 There are three automatic monitoring stations within MCC, all of which monitor NO₂⁵. However, none of these monitoring stations are located in areas that are representative of conditions at the proposed development site.
- 6.2.2 MCC also monitors NO₂ with diffusion tubes. There is one diffusion tube, MAN24, within 500 m of the site.
- 6.2.3 The results from MAN24 are shown in **Table 3** and its location is shown in **Appendix A**. Monitoring data has been obtained from the GMCA (2021) 2020 Annual Status Report⁵.

Table 3: Annual Mean NO₂ Concentrations Monitored by MCC within the Study Area

Site ID	Location	Annual Mean NO ₂ Concentrations (µg/m ³)				
		2016	2017	2018	2019	2020
MAN24 (Kerbside)	383968 398070	45.3	44.7	40.3	40.8	26.8
Annual Mean NO ₂ air quality objective				40 µg/m ³		

- 6.2.4 The monitoring results in **Table 3** indicate that annual mean concentrations of NO₂ were above the NO₂ annual mean objective at MAN24 from 2016 to 2019. In 2020, the NO₂ annual mean concentration was below the NO₂ annual mean objective.
- 6.2.5 The results indicate that the short-term objective for NO₂ was unlikely to be exceeded at the identified monitoring sites as monitored annual mean concentrations were well below the indicative screening concentration of 60 µg/m³ during the period shown.

Particulate Matter (PM₁₀ & PM_{2.5})

- 6.2.6 MCC does undertake PM₁₀ and PM_{2.5} monitoring at automatic monitoring stations⁵. However, as discussed, there are no automatic monitoring stations representative of conditions at the proposed development site.
- 6.2.7 Between 2016 – 2020, the annual mean PM₁₀ concentrations were below the annual mean objective at all three MCC automatic monitoring stations⁵. One automatic monitoring station, Manchester Piccadilly, records PM_{2.5}. Between 2016 – 2020, the annual mean PM_{2.5} concentrations were below the annual mean target at Manchester Piccadilly⁵.

6.3 Transport for Greater Manchester Air Quality Model

- 6.3.1 Transport for Greater Manchester (TfGM) conducted air pollution dispersion modelling for the Combined Authority members which was used to determine the location and extent of the AQMA. The model shows the predicted concentrations of NO₂ in 2016 at locations across the Greater Manchester area at a height of 0 m. The GMCA AQMA was declared where the model predicted annual average NO₂ concentrations above 35 µg/m³⁴.
- 6.3.2 AQMA modelling contours for the site have been obtained from TfGM as shown in **Appendix B**, which shows the predicted 2016 NO₂ concentration at several points in the study area. The screenshot indicates that, based

on 2016 modelling, NO₂ concentrations in the road of Bridge Street were predicted to be above 40 µg/m³ and below 40 µg/m³ on the façade of the development facing Back Bridge Street.

6.4 Background Concentrations

6.4.1 There are no background monitoring locations in the vicinity of the proposed development site.

6.4.2 Background concentrations of NO₂, PM₁₀ and PM_{2.5} obtained from the background concentration maps provided by Defra for the grid squares covering the proposed development⁶ are shown in **Table 4**.

Table 4: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site *

Grid Square	Pollutant	2019
		(µg/m ³)
383500, 398500	NO ₂	28.20
	PM ₁₀	13.07
	PM _{2.5}	8.49

* Background concentrations obtained from the latest 2018 based background maps

7 Effect of Air Quality on the Proposed Development

7.1 The background concentrations in **Table 4** show that background concentrations of NO₂ and PM₁₀ are below health-based air quality objectives of 40 µg/m³ for both pollutants as well as below the PM_{2.5} annual mean target. However, the site is likely experiencing higher concentrations due to its proximity to the road network.

7.2 The AQMA is only declared only on the basis of annual average levels of NO₂⁵, not PM₁₀ concentrations. Therefore, the air quality objectives for particulate matter is not expected to be exceeded within MCC. The monitoring results discussed in **Section 6.2** support this. Monitored concentrations of PM_{2.5} are not expected to exceed the target level.

7.3 Diffusion tube MAN24 is located approximately 480 m southeast of the development site. Both the development and MAN24 are located on the A34. However, the development site is located approximately 3 m from the kerb of Bridge Street and MAN24 is 0.5 m of the Princess Street kerbside⁵. MAN24 is positioned at a height of 3 m. The NO₂ results in **Table 3** show that the NO₂ annual mean objective has been exceeded until 2019. In 2020, the annual mean NO₂ concentration was below the objective. However, due to Covid-19 lockdowns affecting traffic flows during 2020, the results from 2020 may not be representative of typical years.

7.4 Air quality dispersion modelling of GMCA, including Bridge Street, was completed by TfGM in 2014. An ADMS model was compiled and run for the year 2016. The screenshot of the NO₂ output from the dispersion model of the development site at a height of 0 m is provided in **Appendix B**. The screenshot indicates that, based on 2016 modelling, NO₂ concentrations in the road of Bridge Street were predicted to be above 40 µg/m³ and below 40 µg/m³ on the façade of the development facing Back Bridge Street. As shown in **Table 3**, monitored NO₂

⁶ <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

concentrations have experienced an overall decrease at MAN24 since 2016, excluding the slight increase in NO₂ concentrations from 40.3 µg/m³ in 2018 to 40.8 µg/m³ in 2019⁵.

- 7.5 The ground floor of the development will retain its existing commercial use. Monitoring at MAN24 and the TfGM modelling screenshot indicates that the development is unlikely to exceed the short-term NO₂ objective as concentrations are likely to be below 60 µg/m³¹.
- 7.6 The annual mean and short-term objectives apply to the residential dwellings within the development. Concentrations from primary pollutants, such as NO₂, decrease as the distance from the source increases, due to the dispersion of pollutants. The residential units within the proposed development will be located on the first and second floors of the proposed development. Therefore, at this height, the residential units are expected to be exposed to concentrations lower than those at the ground floor level. As the monitored concentrations at MAN24 were just above the annual mean objective in 2018 and 2019 and MAN24 is closer to the roadside than the development, the residential units will likely be exposed to concentrations below the annual mean objective.
- 7.7 The evidence from existing information sources is that the residential units within the proposed development site are likely to experience levels of NO₂ and PM₁₀ below the annual mean and short-term objectives for the pollutants and below the PM_{2.5} target.

8 Impact of the Proposed Development on Existing Air Quality

- 8.1 As discussed above, the development does not include car parking spaces. Therefore, the proposed development is not expected to have a significant impact on local air quality through traffic-related emissions².
- 8.2 The heating system has not yet been decided. Electric heating systems do not have a significant impact on local air quality. Any gas-fired boilers installed will meet the IAQM² minimum standard of <40 mgNO_x/kWh to ensure the heating system does not have a significant impact on local air quality.

9 Mitigation

- 9.1 Mitigation is not required to safeguard existing residents from air pollution, as the development is not expected to have a significant impact on local air quality. There are no car parking spaces so electric vehicle charging points cannot be installed. The development site is well situated in terms of amenities as well as public transport.
- 9.2 Mitigation is not required to safeguard future users of the development site, as the commercial area is expected to be exposed to air pollutants below the short-term NO₂ and PM₁₀ objectives and the residential units are expected to be exposed to air pollutants below the annual mean and short-term NO₂ and PM₁₀ objectives as well as below the PM_{2.5} target.

10 Summary of Impacts and Conclusion

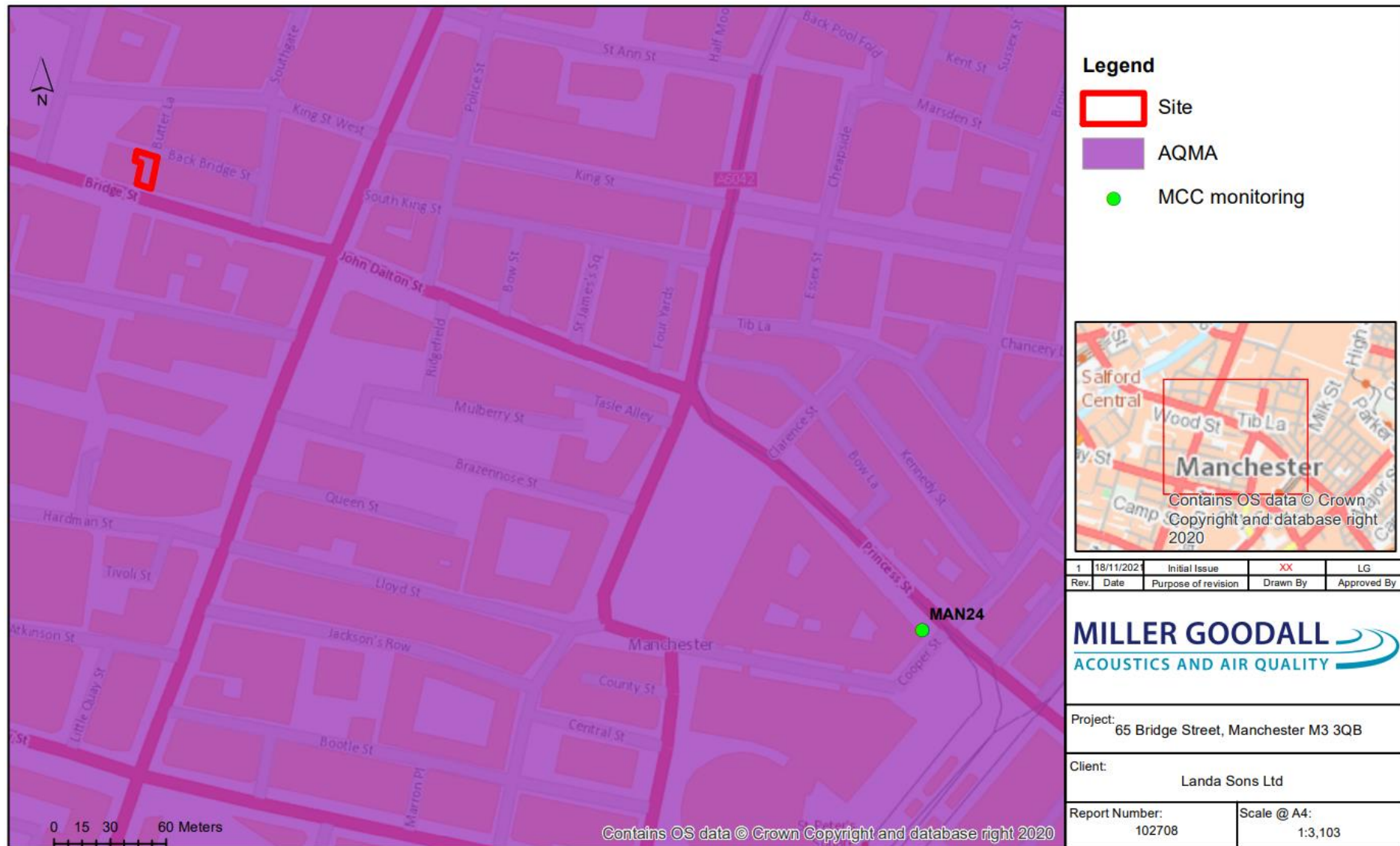
- 10.1 This air quality report assesses the potential changes in air quality due to the operation of the proposed development and whether these potential changes would significantly alter air quality as well as the suitability of the site for residential use.

- 10.2 Concentrations of NO₂ and PM₁₀ are likely to be below their respective long and short-term objectives at the residential dwellings within the proposed development site. Concentrations of PM_{2.5} are expected to be below the annual mean target.
- 10.3 The proposed development is not expected to have a significant impact on local air quality.
- 10.4 Therefore, we see no reason for condition 3 not to be discharged.

APPENDICES

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Appendix A: Location of site, AQMA, MCC monitoring and receptors



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Appendix B: Screenshot from TfGM modelling



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Glossary of Terms

AADT Annual Average Daily Traffic flow

Air Quality Standard Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health and the environment

Air Quality Objective Pollutant Objectives incorporate future dates by which a standard is to be achieved, taking into account economic considerations, practicability and technical feasibility

Annual Mean A mean pollutant concentration value in air which is calculated on a yearly basis, yielding one annual mean per calendar year. In the UK air quality regulations, the annual mean for a particular substance at a particular location for a particular calendar year is:

- (a) in the case of lead, the mean of the daily levels for that year;
- (b) in the case of nitrogen dioxide, the mean of the hourly means for that year;
- (c) in the case of PM₁₀, the mean of the 24-hour means for that year.

AQAP Air Quality Action Plan

AQEG Air Quality Expert Group

AQMA Air Quality Management Area

AQMP Air Quality Management Plan

AQO Air Quality Objective

AQS Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Background Concentrations The term used to describe pollutant concentrations which exist in the ambient atmosphere, excluding local pollution sources such as roads and stacks

Defra Department for Environment, Food and Rural Affairs

Effects The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or mortality due to exposure to PM₁₀ or PM_{2.5} or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

EPUK Environmental Protection UK

HDV Heavy Duty Vehicle

Impacts The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

LAQM Local Air Quality Management

LDV Light Duty Vehicle

Mg/m³ Microgrammes (of pollutant) per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m³ means that one cubic metre of air contains one microgramme (millionth of a gramme) of pollutant

NO₂ Nitrogen Dioxide

NO_x A collective term used to represent the mixture of nitrogen oxides in the atmosphere, as nitric oxide (NO) and nitrogen dioxide (NO₂)

NPPF National Planning Policy Framework

Nuisance The term nuisance dust is often used in a general sense when describing amenity dust. However, this term also has specific meanings in environmental law:

Statutory nuisance, as defined in S79(1) of the Environmental Protection Act 1990 (as amended from time to time).

Private nuisance, arising from substantial interference with a person's enjoyment and use of his land.

Public nuisance, arising from an act or omission that obstructs, damages or inconveniences the right of the community.

Each of these applying in so far as the nuisance relates to the unacceptable effects of emissions. It is recognised that a significant loss of amenity may occur at lower levels of emission than would constitute a statutory nuisance.

Note: as nuisance has a specific meaning in environmental law, and to avoid confusion, it is recommended that the term is not used in a more general sense.

PM_{2.5} The fraction of particles with a mean aerodynamic diameter equal to, or less than, 2.5 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM_{2.5}, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter

PM₁₀ The fraction of particles with a mean aerodynamic diameter equal to, or less than, 10 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM₁₀, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter

Running Annual Mean A mean pollutant concentration value in air which is calculated on an hourly basis, yielding one running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours

