

Air Quality and Dust Monitoring Overview Report



Department for Transport

High Speed Two (HS2) Limited has been tasked by the Department for Transport (DfT) with managing the delivery of a new national high speed rail network. It is a non-departmental public body wholly owned by the DfT.

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Non-technical summary

This Air Quality and Dust Monitoring Report is published in fulfilment of commitments detailed in the High Speed Rail (London-West Midlands) Environmental Minimum Requirements (EMRs), Annex 1: Code of Construction Practice, for the nominated undertaker to present the results of air quality and dust monitoring.

This report highlights out the applicable standards and guidance, as well as monitoring methodology, followed by nominated undertakers in undertaking the required air quality and dust monitoring.

This report should be read in conjunction with the monthly summary reports, available from www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2. It should be noted that the establishment of a monitoring regime is programme driven, and as such, not all works, where monitoring is required, are starting at the same time. In due course, reports will be produced and published for other local authority areas along Phase One as monitoring is established.

Abbreviations and descriptions

The abbreviations, descriptions and project terminology used within this report can be found in the Project Dictionary (HS2-HS2-PM-GDE-000-000002).

AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BPM	Best practicable means
CFA	Community Forum Area
CoCP	Code of Construction Practice
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
EA	Environment Agency
EMR	Environmental Minimum Requirements
EPA	Environmental Protection Act
EPUK	Environmental Protection UK
ES	Environmental Statement
HGV	Heavy Goods Vehicle
HS2	High Speed Two Limited
IAQM	Institute of Air Quality Management
IPPC	Integrated Pollution Prevention and Control
LAPPC	Local Authority Pollution Prevention and Control
LDV	Light Duty Vehicle
LEMP	Local Environmental Management Plan
LGV	Light Goods Vehicle
NO _x	Oxides of nitrogen
NO ₂	Nitrogen dioxide
PM ₁₀	Particulate matter with an average aerodynamic diameter not exceeding 10 micrometres
SPG	Supplementary Planning Guidance
ULEV	Ultra Low Emission Vehicle

1 Introduction

- 1.1.1 High Speed Two (HS2) Limited have nominated undertakers to undertake the required air quality and dust monitoring, as necessary, to comply with the requirements of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements (EMR), including specifically Annex 1: Code of Construction Practice. Monitoring will fulfil the following aims:
- monitoring the effectiveness of mitigation measures;
 - monitoring the impact of construction works; and
 - inform taking other actions as may be necessary to enable compliance.
- 1.1.2 Monitoring data and interpretive summary reports for Phase 1 works are provided to each relevant local authority on a monthly basis and include a summary of the construction activities occurring during the monitoring period, any complaints received, the data recorded over the monitoring period, any periods in exceedance of agreed trigger levels, the results of any investigations; and where the works have been found to be the source of exceedances, any action taken to immediately resolve the issue and to prevent a recurrence.
- 1.1.3 This report highlights out the applicable standards and guidance, as well as monitoring methodology, followed by nominated undertakers in undertaking the required air quality and dust monitoring.
- 1.1.4 This report should be read in conjunction with the monthly summary reports, available from www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2. It should be noted that the establishment of a monitoring regime is programme driven, and as such, not all works, where monitoring is required, are starting at the same time. In due course, reports will be produced and published for other local authority areas along Phase One as monitoring is established.

2 Applicable standards and guidance

2.1 Relevant legislation

High Speed Rail (London – West Midlands) Act 2017

2.1.1 On 23 February 2017, Royal Assent was granted for Phase One of HS2. The High Speed Two Bill is now an Act of Parliament (law) i.e. High Speed Rail (London - West Midlands) Act 2017.

2.1.2 The Act is accompanied by the EMR. The EMR set out high level environmental and sustainability commitments and are contained in the EMR General Principles document supported by a series of annexes:

- Annex 1: Code of Construction Practice;
- Annex 2: Planning Memorandum;
- Annex 3: Heritage Memorandum; and
- Annex 4: Environmental Memorandum.

Environmental Minimum Requirements: General Principles

2.1.3 The EMR - General Principles require that the controls to be implemented in delivering the scheme (including the EMRs, powers contained in the Act and Undertakings) will ensure that impacts which have been assessed in the Environmental Statement (ES) will not be exceeded. If the significant adverse impacts identified in the ES are likely to be exceeded, all reasonable steps will be taken to minimise or eliminate those additional impacts.

2.1.4 The EMRs also require compliance with the undertakings and assurances.

2.1.5 Annex 1 to the EMRs comprises a Code of Construction Practice (CoCP), which shall be adopted and implemented by the nominated undertaker in delivering the works, the high-level requirements of which are set out below.

Code of Construction Practice (CoCP)

2.1.6 The CoCP details a range of control measures and standards to be implemented during construction works across Area South (and all of Phase 1 Areas) to protect communities and the environment.

2.1.7 Section 7 of the CoCP stipulates the air quality management controls, including the monitoring to be implemented. The key requirement is for Best Practical Means (BPM) to be employed to limit dust, odour, and exhaust emissions during construction works.

Construction dust

Environmental Protection Act 1990

2.1.8 Under Part III of the Environmental Protection Act 1990 (EPA), a local authority has a duty to inspect its area from time to time to detect any statutory nuisances and to take such steps as

are reasonably practicable to investigate any complaint of a statutory nuisance made by a person living within its area. Relevant statutory nuisances (under relevant conditions) include dust, odour, smoke, and fumes or gases which are prejudicial to health or a nuisance.

- 2.1.9 Work sites have the potential to give rise to dust, fumes, and odour during demolition and construction works and need to be managed in accordance with BPM. BPM is defined in Section 79 of the Environmental Protection Act 1990 as those measures which are reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications’.

Pollution Prevention and Control Act 1999

- 2.1.10 The Pollution Prevention & Control Act 1999 and Environmental Permitting (England and Wales Regulations) 2010 which together govern the Environment Agency (EA) Integrated Pollution Prevention and Control (IPPC) and Local Authority Pollution Prevention and Control (LAPPC).
- 2.1.11 Future air quality related construction operations that may fall within the environmental permitting regime include crushing operations, batching plant and on-site waste operations.
- 2.1.12 Operations such as these will have stringent dust control requirements including monitoring and inspections as conditions of their permit.

Air quality around highways

EU and UK Air Quality Management Legislation

- 2.1.13 In 1996 the European Commission published the Air Quality Framework Directive on ambient air quality assessment and management (96/62/EC). This directive defined the policy framework for 12 air pollutants known to have harmful effects on human health and the environment. Limit values (pollutant concentrations not to be exceeded by a certain date) for each specified pollutant were set through a series of Daughter Directives. Directive 1999/30/EC (the 1st Daughter Directive) sets limit values for Nitrogen Dioxide (NO₂) and Particulate Matter with an average aerodynamic diameter not exceeding 10 micrometres (PM₁₀) (amongst other pollutants) in ambient air.
- 2.1.14 In May 2008, the Directive 2008/50/EC on ambient air quality and cleaner air for Europe came into force. This Directive consolidates the above (apart from the 4th Daughter Directive), makes provision for extended compliance deadlines and sets new limit values for fine particulate matter (PM_{2.5}).
- 2.1.15 The Directive 2008/50/EC was transposed into national legislation in England by the Air Quality Standards Regulations 2010 (as amended). The Secretary of State for the Environment has the duty of ensuring the air quality limit values are complied with.

2.1.16 The air quality limit values and objectives for England for the pollutants relevant to this project are detailed in Table 1 below.

Table 1: UK air quality objectives relevant to construction dust and highways

Pollutant	Averaging Period	Limit value / objective
Human Health		
Nitrogen dioxide (NO ₂)	Annual mean	40 µg/m ³
	1-hour mean	200 µg/m ³ [not to be exceeded more than 18 times a year (99.8 th percentile)]
Particulate matter (PM ₁₀)	Annual mean	40 µg/m ³
	24-hour mean	50 µg/m ³ not to be exceeded more than 35 times a year (90.4 th percentile)
Fine particulate matter (PM _{2.5})	Annual mean	25 µg/m ³
Vegetation		
Oxides of nitrogen (NO _x)	Annual mean	30 µg/m ³

2.2 Relevant Guidance

Construction dust

IAQM Guidance

- 2.2.1 The Institute of Air Quality Management (IAQM) has published revised guidance on air quality monitoring in the vicinity of demolition and construction sites, which sets up-to-date monitoring protocols and techniques (IAQM (2018) *Guidance on Monitoring in the Vicinity of Demolition and Construction Sites v1.1*). The approach to monitoring is based on the risk rating for the demolition / construction site, derived from an assessment of construction dust emissions as described in the IAQM (2014) *Guidance on the assessment of dust from demolition and construction v1.1*.
- 2.2.2 The IAQM guidance proposes that visual inspections for dust emissions are undertaken at least once on each working day and the results clearly recorded in the site log for all construction / demolition sites (regardless of the risk rating).
- 2.2.3 The IAQM guidance also suggests where dust monitoring is required based on the level of risk of dust emissions.
- 2.2.4 Priority will be given to using near real time measurements of airborne dust, to provide information for active dust management.
- 2.2.5 The guidance recommends the use of a revised real-time measurement site action level of 190 µg/m³ (1-hour average).

GLA Guidance

- 2.2.6 The Mayor's Supplementary Planning Guidance (SPG) on the control of dust and emissions during construction and demolition includes site monitoring protocols depending on the risk category of the site. The GLA guidance replicates the IAQM 2014 risk assessment matrix and associated control measures and monitoring requirements based on the level of risk of dust emissions.

Air quality around highways

Local Air Quality Management: Technical Guidance LAQM.TG(16)

- 2.2.7 Defra's Technical Guidance (TG16)¹ sets the requirements and considerations to be taken when monitoring concentrations of NO₂ associated with highways. It provides recommendations for the selection of appropriate locations and the duration of the monitoring surveys and it specifies minimum requirements for quality assurance and quality control, laboratory performance, precision and bias.

¹ See: London Local Air Quality Management Technical Guidance LLAQM (TG.16)

3 Monitoring methodology

3.1 Construction dust

- 3.1.1 Monitoring of dust during construction of the project will be undertaken in accordance with Section 7 of the CoCP. The CoCP refers to the best practice in the IAQM and the GLA guidance documents as detailed in Section 2.
- 3.1.2 Visual inspections for dust emissions will be undertaken at least once on each working day and the results recorded in the site log for all construction / demolition sites (regardless of the risk rating).
- 3.1.3 Dust will be measured at appropriate locations at the site boundary and/or at sensitive receptors using instruments that provide continuous measurements of particulate matter as PM₁₀. As a minimum standard of measurement uncertainty, these instruments shall be certified through MCERTS as being indicative ambient particulate monitors.

Risk rating

- 3.1.4 The risk rating for all future demolition / construction work sites will be based on IAQM 2014 construction dust assessment guidance. Each detailed assessment will follow the methodology provided in the aforementioned IAQM guidance. The risk assessment for each demolition/construction work site will assess:
- Potential magnitude of dust emissions.
 - Sensitivity of the area.
 - Risk of dust impacts.
 - Assessment of cumulative effects.
 - Mitigation measures to be considered.
 - Monitoring requirements.
- 3.1.5 Where a risk rating of Medium or High is recorded, real time dust monitoring associated with the sites will be installed in advance of the commencement of works. Locations and results of this monitoring is presented in applicable monthly summary reports.

3.2 Air quality around highways

- 3.2.1 The locations, duration and standard of air quality monitoring around highways is being undertaken in accordance with Defra's TG16 guidance and any future revisions of it.
- 3.2.2 Monitoring locations include areas where the ES identified sensitive receptors where significant effects may occur. All monitoring locations are within the London Low Emission Zones. Furthermore, the establishment of a monitoring regime is programme driven, and as such, not all works, where monitoring is required, are starting at the same time. In due course, reports

will be produced and published for other local authority areas along Phase One as monitoring is established.

3.2.3 Locations and results of this monitoring is presented in applicable monthly summary reports.

4 Monitoring results

4.1.1 All monthly monitoring locations and results are presented in applicable monthly summary reports.

4.2 Construction dust

4.2.1 For construction and demolition sites with low risk of dust impacts, commentary text on visual inspections is provided in monthly summary reports.

4.2.2 For construction and demolition sites with medium or high risk of dust impacts monthly summary reports include:

- Commentary text on any visual inspections undertaken;
- Commentary text on the relevant trigger level; currently $190 \mu\text{g}/\text{m}^3$ as a 1-hour mean;
- A table of summary statistics for each monitoring site – max, min, mean concentrations of PM_{10} , and number of exceedances of the trigger level; and
- Line charts of monthly data from each monitor relevant to each site, with trigger level line.

4.3 Air quality around highways

4.3.1 Monthly summary reports, present data which is two months in arrears due to the time required for laboratory analysis. Monthly summary reports include, a table of monthly monitoring locations and results; and summary table of all previous monthly monitoring results in 2018 and running mean ($\mu\text{g}/\text{m}^3$).

4.4 Complaints

4.4.1 Any complaints, relating to dust or air quality, received during the monitoring periods will be included in the monthly summary reports.