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High Speed Rail  
(London-West Midlands)

Air Quality and Dust Monitoring  
Monthly Report - January 2018

City of Westminster

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February 2018





## 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 carried out within the City of Westminster (CoW).

The report presents data from thirteen nitrogen dioxide (NO<sub>2</sub>) diffusion tube monitoring locations around highways within the borough during December 2017 as part of the management of air quality where significant effects may occur due to the scheme.

NO<sub>2</sub> monitoring results can be found in Section 4 of the report. NO<sub>2</sub> concentrations from diffusion tube monitoring over the course of 2017 and running mean can be found in Appendix B.

Whilst this report is limited to data informing pre-construction conditions, future reports will present this and data collected from monitoring around active work sites as they are established within CoW. Future CoW monthly reports will include a summary of the construction activities occurring; any complaints received; the data recorded over the monitoring period; any periods in exceedance of the agreed trigger levels; the results of any investigations; and, where the works have been found to be the source, any action taken to immediately resolve the issue and to prevent a recurrence.

## Abbreviations and descriptions

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
EPUK	Environmental Protection UK
ES	Environmental Statement
HGV	Heavy Goods Vehicle
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 <sub>x</sub>	Oxides of nitrogen
NO <sub>2</sub>	Nitrogen dioxide
PM <sub>10</sub>	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 The nominated undertaker is required to undertake air quality and dust monitoring as necessary to comply with the requirements of the High Speed Rail (London-West Midlands) Environmental Minimum Requirements, 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 reports are to be provided to each relevant local authority monthly and shall include a summary of the construction activities occurring, 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, any action taken to immediately resolve the issue and to prevent a recurrence.
- 1.1.3 The report presents data from Nitrogen Dioxide (NO<sub>2</sub>) Diffusion Tube monitoring carried out around highway locations within the City of Westminster (CoW) during December 2017.
- 1.1.4 There are no current worksites located within CoW. Therefore, no dust monitoring has been carried out.

# 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 Environmental Minimum Requirements (EMRs). The EMRs set out the 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 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 the 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 monitoring to be implemented. The key requirement is for BPM to be employed to limit dust, odour, and exhaust emissions during construction work.

### **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 Best Practicable Means (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 NO<sub>2</sub> and PM<sub>10</sub> (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<sub>2.5</sub>).
- 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
<i>Human health</i>		
Nitrogen dioxide (NO <sub>2</sub> )	Annual mean	40 µg/m <sup>3</sup>
	1-hour mean	200 µg/m <sup>3</sup> <i>not to be exceeded more than 18 times a year (99.8th percentile)</i>
Particulate matter (PM <sub>10</sub> )	Annual mean	40 µg/m <sup>3</sup>
	24-hour mean	50 µg/m <sup>3</sup> <i>not to be exceeded more than 35 times a year (90.4th percentile)</i>
Fine particulate matter (PM <sub>2.5</sub> )	Annual mean	25 µg/m <sup>3</sup>
<i>Vegetation</i>		
Oxides of nitrogen (NO <sub>x</sub> )	Annual mean	30 µg/m <sup>3</sup>

## 2.2 Relevant guidance

### Construction dust

#### *IAQM Guidance*

- 2.2.1 The Institute of Air Quality Management (IAQM) has published guidance on air quality monitoring in the vicinity of demolition and construction sites, which sets up to date monitoring protocols and techniques (*IAQM (2012) Guidance on air quality monitoring in the vicinity of demolition and construction sites*). 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*.
- 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 In the Area South 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 real-time measurement site action level of 250 µg/m<sup>3</sup> (15min) unless other information becomes available, when more appropriate level can be set.

### *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)*<sup>1</sup> sets the requirements and considerations to be taken when monitoring concentrations of NO<sub>2</sub> 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.

# **3 Monitoring methodology**

## **3.1 Air quality around highways**

- 3.1.1 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.

### **Monitoring locations**

- 3.1.2 Table 2 lists the HS2 diffusion tube locations in CoW. Figure 1 in Appendix A shows the location of the diffusion tubes.

Table 2 - Monitoring locations for City of Westminster – air quality around highways

<b>Monitoring site ID</b>	<b>Grid reference (x,y)</b>	<b>Location description</b>
HS2-000020BMD	528776, 182170	Lamp post on Park Crescent Road
HS2-000020BME	528901, 182180	Lamp post in between A501 and A4201
HS2-000020BMX	527206, 182887	Sign post by roundabout on A5205
HS2-000020BMY	526549, 182226	Lamp post between Blomfield Road and Edgware Road
HS2-000020BNo	523869, 182465	Lamp post on Ladbroke Grove
HS2-000020BND	528276, 182185	Outer Circle Regent’s Park
HS2-000020BNJ	527359, 182633	Light post on Park Road

<sup>1</sup> See also: London Local Air Quality Management Technical Guidance LLAQM(TG.16)

Monitoring site ID	Grid reference (x,y)	Location description
HS2-000020BNK	527048, 181731	London Underground sign outside Edgware Rd Station
HS2-000020BNL	526914, 182077	Lamp post on Penfold Street
HS2-000020BP1	528597, 180942	Lamp post on Brook Street
HS2-000020BPG	527019, 182748	Lamp post on St John's Wood Street
HS2-000020BPH	526818, 1831644	Lamp post St John's Wood Terrace
HS2-000020BP3	528125, 182016	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations

## 4 Monitoring results

### 4.1 Air quality around highways

#### Data summary

- 4.1.1 Table 3 below details the monitoring results from the NO<sub>2</sub> diffusion tube monitoring survey in CoW for the month of December. This data is two months in arrears due to the time required for lab analysis.
- 4.1.2 Table 4 in Appendix B details NO<sub>2</sub> concentrations from diffusion tube monitoring for all previous months in 2017 and running mean (µg/m<sup>3</sup>).

Table 3 - Monitoring results - air quality around highways

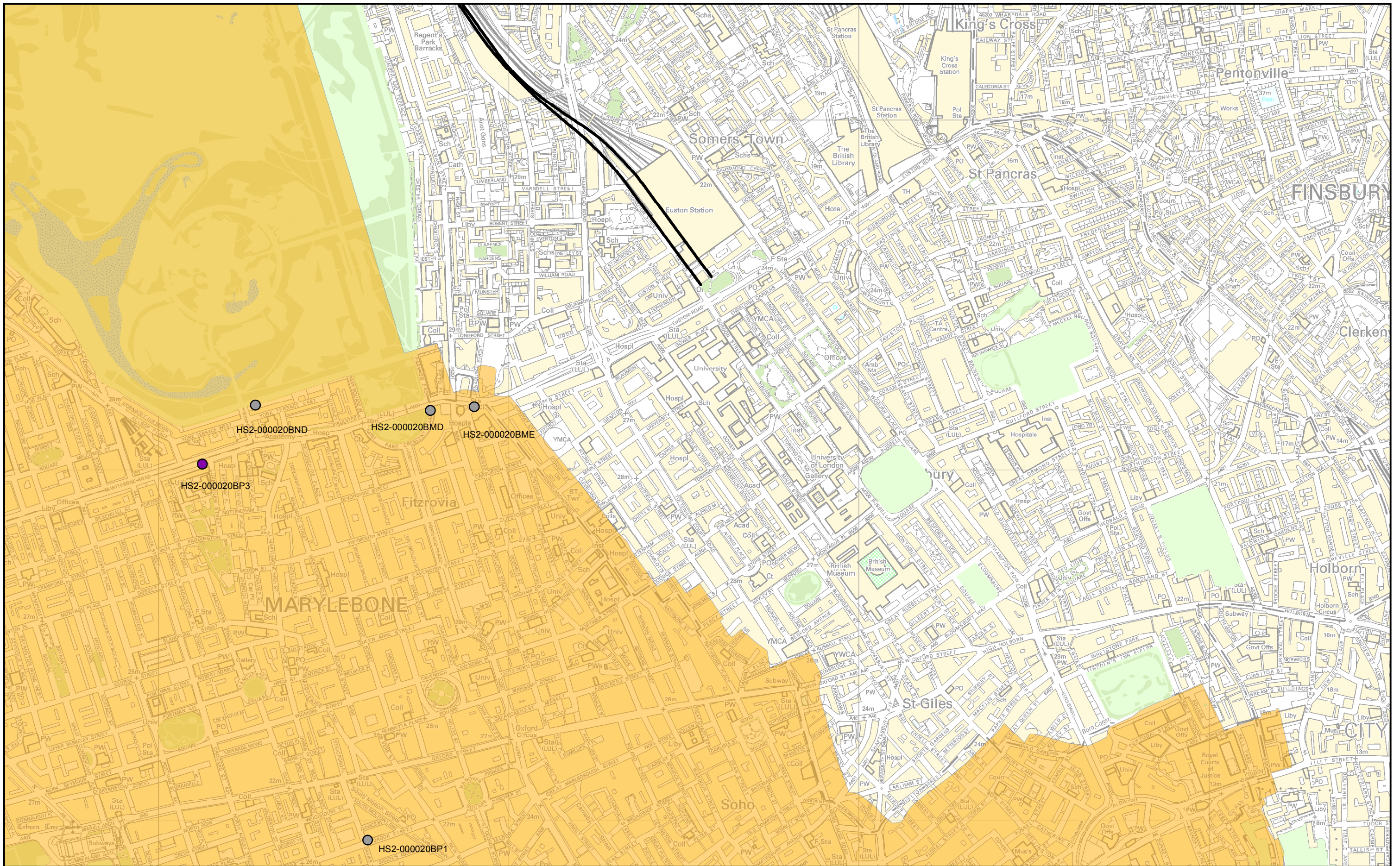
Monitoring Site ID	Location description	Provisional NO <sub>2</sub> concentration for December 2017 (µg/m <sup>3</sup> )
HS2-000020BMD	Lamp post on Park Crescent Road	61
HS2-000020BME	Lamp post in between A501 and A4201	85
HS2-000020BMX	Sign post by roundabout on A5205	55
HS2-000020BMY	Lamp post between Blomfield Road and Edgware Road	64
HS2-000020BNo	Lamp post on Ladbroke Grove	50
HS2-000020BND	Outer Circle Regent's Park	51
HS2-000020BNJ	Light post on Park Road	68
HS2-000020BNK	London Underground sign outside Edgware Rd Station	79
HS2-000020BNL	Lamp post on Penfold Street	52
HS2-000020BP1	Lamp post on Brook Street	80
HS2-000020BPG	Lamp post on St John's Wood Street	51
HS2-000020BPH	Lamp post St John's Wood Terrace	55
HS2-000020BP3	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	91

## **4.2**      **Complaints**

4.2.1      There are no complaints relating to dust or air quality in this period.

# Appendix A – Monitoring locations

## Air quality around highways



- Legend**
- Route in tunnel
  - Route on surface
  - NO2 diffusion tube
  - NO2 diffusion tube (co-located)
  - Westminster Local Authority

Figure Number

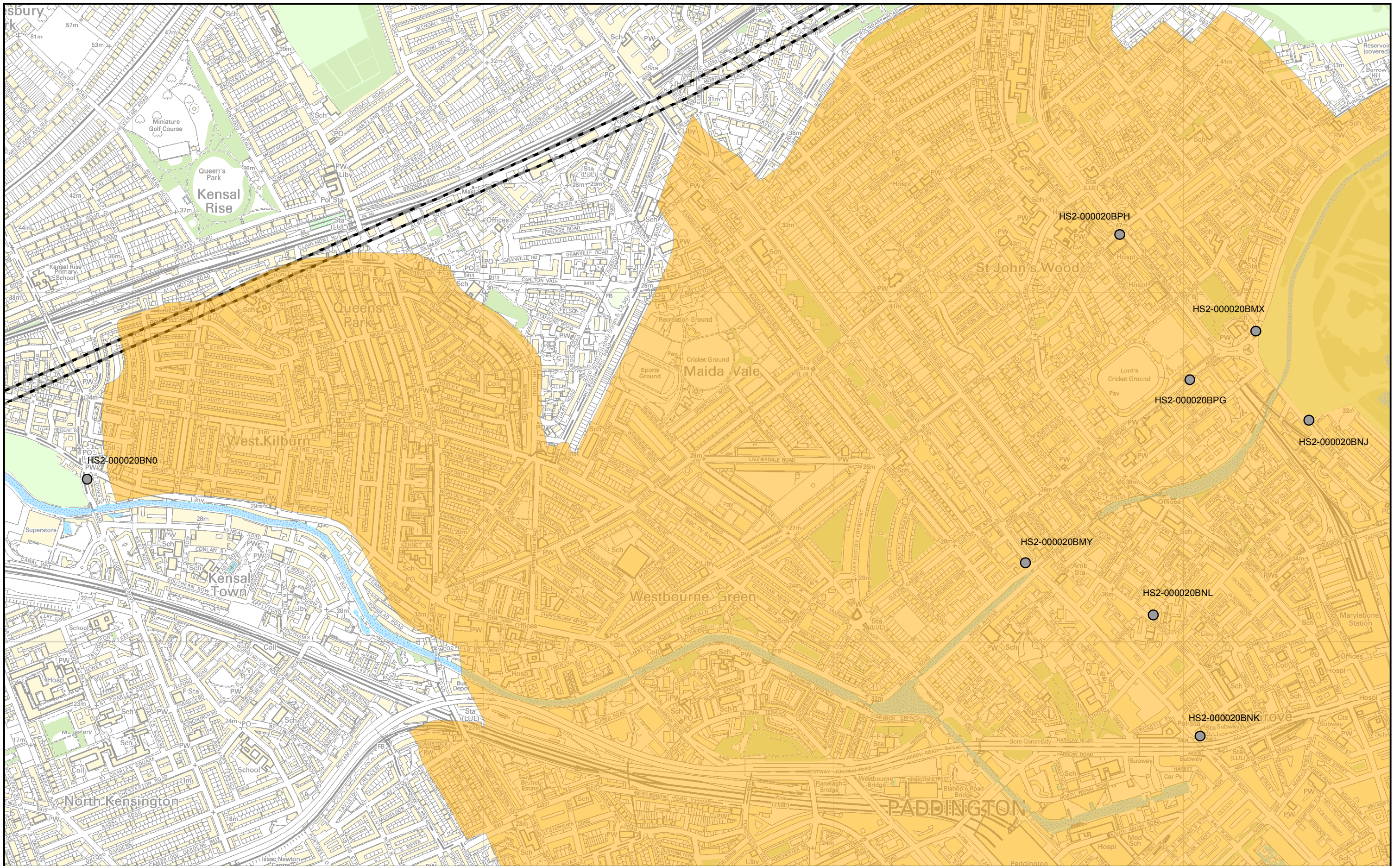
Figure Name  
**Nitrogen dioxide tube monitoring site locations (sheet 1)**

London Borough of Westminster

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- Legend**
- Route in tunnel
  - Route on surface
  - NO2 diffusion tube
  - NO2 diffusion tube (co-located)
  - Westminster Local Authority

Figure Number

Figure Name  
**Nitrogen dioxide tube monitoring site locations (sheet 2)**

London Borough of Westminster

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## Appendix B – Monitoring data

### Air quality around highways

Table 4 - Air quality around highways NO<sub>2</sub> concentrations from diffusion tube monitoring all months and running mean (µg/m<sup>3</sup>) within the City of Westminster

Monitoring Site ID	Location description	Jan 2017	Feb 2017	Mar 2017	Apr 2017	May 2017	June 2017	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017	Mean <sup>2</sup>
HS2-000020BMD	Lamp post on Park Crescent Road	81	84	78	80	80	92	61	69	72	67	72	61	75
HS2-000020BME	Lamp post in between A501 and A4201	106	89	93	98	77	86	83	87	87	100	94	85	91
HS2-000020BMX	Sign post by roundabout on A5205	77	62	69	56	56	46	40	50	52	59	65	55	57
HS2-000020BMY	Lamp post between Blomfield Road and Edgware Road	82	63	54	63	Tube missing	74	47	57	62	61	73	64	64
HS2-000020BNo	Lamp post on Ladbroke Grove	68	58	47	No data	No data	54	38	42	Tube missing	47	54	50	51
HS2-000020BND	Outer Circle Regent's Park	58	55	50	43	35	41	27	Tube missing	39	50	55	51	46
HS2-000020BNJ	Light post on Park Road	74	Tube missing	70	51	63	59	43	54	55	58	65	68	60

<sup>2</sup> Note: to aid interpretation and conform with best practice, the monthly measurements in this table are reported rounded to the nearest whole number. The annual mean presented here is calculated based on laboratory data to 4 significant figures, rounded to a whole number, and therefore may differ slightly to a mean derived from averaging the rounded monthly measurements in the table.

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HS2-000020BNK	London Underground sign outside Edgware Rd Station	86	79	73	73	86	80	68	Tube missing	79	74	85	79	78
HS2-000020BNL	Lamp post on Penfold Street	69	57	48	45	44	43	29	39	47	48	56	52	48
HS2-000020BP1	Lamp post on Brook Street	77	74	67	60	57	68	50	51	56	69	73	80	65
HS2-000020BPG	Lamp post on St John's Wood Street	73	55	49	45	45	43	34	41	43	43	55	51	48
HS2-000020BPH	Lamp post St John's Wood Terrace	71	58	51	48	44	49	29	47	43	50	63	55	51
HS2-000020BP3	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	109	84	93	81	81	93	63	70	76	90	92	91	85



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