High Speed Rail (London-West Midlands)

Air Quality and Dust Monitoring Monthly Report - March 2018

London Borough of Ealing

April 2018

COSTAIN SKANSKA

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Department for Transport

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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 London Borough of Ealing (LBE).

The report presents data during March 2018 from five dust monitoring locations installed around the Willesden Euro Terminal, Atlas Road, Victoria Road and Old Oak Common Depot (in the London Borough of Hammersmith and Fulham) worksites where works are underway.

The report presents data from six nitrogen dioxide (NO_2) diffusion tube monitoring locations around highways within the borough during February 2018 as part of the management of air quality where significant effects may occur due to the scheme.

Dust and NO_2 monitoring results can be found in Section 4 of the report. NO_2 concentrations from diffusion tube monitoring over the course of 2018 and running mean can be found in Appendix C. Line charts of monthly data from each dust monitor can also be found in Appendix C.

Whilst this report is limited to data informing both pre-construction and pre-demolition conditions, future reports will present this and data collected from monitoring around active work sites as they are established within LBE. This and future LBE 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_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 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_2) Diffusion Tube monitoring carried out around highway locations within the London Borough of Ealing (LBE) during February 2018. It also presents continuous dust monitoring data installed around worksites at the Willesden Euro Terminal, Atlas Road, Victoria Road and Old Oak Common Depot (in the London Borough of Hammersmith and Fulham) where works are underway during March 2018.

1.1.4 Current worksites located within LBE are detailed in Figure 1, Appendix A and include:

- Victoria Road, *worksite ref. S002-WS01*
  - Works activities include securing of site and pre-demolition surveys
- Atlas Road, *worksite ref. S001-WS02*
  - Works activities include securing of site and pre-demolition surveys
- Willesden Euro Terminal, *worksite ref. S001-WS03*
  - Works activities include securing of site and pre-demolition surveys
- Old Oak Common Depot, worksite ref. W004-WS01
  - Works activities include securing of site and pre-demolition surveys

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 NO2 and 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 (PM2.5).

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 (99.8th percentile)
Particulate matter (PM10)	Annual mean	40 µg/m^3
	24-hour mean	50 µg/m^3 not to be exceeded more than 35 times a year (90.4th percentile)
Fine particulate matter (PM2.5)	Annual mean	25 µg/m^3
Vegetation		
Oxides of nitrogen (NOx)	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 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^3 (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)[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.

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 Future 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 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.

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

- Monitoring requirements.

3.1.5 The risk ratings for worksites at the Willesden Euro Terminal, Atlas Road and Victoria Road are 'High' and therefore require real time dust monitoring.

Monitoring locations

3.1.6 Current dust monitoring locations have been established at locations near sensitive receptors around the Willesden Euro Terminal, Atlas Road Victoria Road and Old Oak Common Depot (located in the London Borough of Hammersmith and Fulham) worksites where works are currently underway. These monitoring locations are detailed in Table 2 below and in Figure 2 in Appendix B.

Table 2 – Monitoring locations – construction dust

Worksite reference	Monitoring site ID	Grid reference (x,y)	Location description	Area of works	Dust risk rating for site	Monitoring site active during period (Y/N)	Change to site since previous period report (Y/N)
S002-WS01	AQ023	520957, 182147	School Road	Victoria Road	H	Yes	N/A
S001-WS02	AQ025	521296, 182354	Victoria Road	Atlas Road	H	Yes	N/A
S001-WS02	AQ026	521428, 182495	Old Oak Lane	Atlas Road	H	Yes	N/A
S001-WS03	AQ027	521515, 182705	Stephenson Street	Willesden Euro Terminal	H	Yes	N/A
S002-WS01	AQ028	521309, 182085	Wells House Road	Old Oak Common (London Borough of Hammersmith and Fulham)	H	Yes	N/A

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.

Monitoring locations

3.2.2 Table 3 lists the HS2 diffusion tube locations in Ealing. Figure 1 in Appendix B shows the location of the diffusion tubes.

Table 3 - Monitoring locations for Ealing – air quality around highways

Monitoring site ID	Grid reference (x,y)	Location description
HS2-000020BN5	521443, 182477	Sign post on Victoria Road
HS2-000020BN7	520959, 181102	The Approach street sign
HS2-000020BQF	520856, 181733	Conway Drive sign post
HS2-000020BQG	521312, 182033	Lamp post outside No 1. Wells House Road on Old Oak Common Lane
HS2-000020BP6	520430, 181950	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station
HS2-000020BP7	518537, 182708	Triplicate site next to the Ealing, Hangar Lane Gyratory roadside automatic monitoring station

4 Monitoring results

4.1 Construction dust

Data summary

4.1.1 For construction and demolition sites with low risk of dust impacts commentary text on visual inspections will be provided in future reports.

4.1.2 For construction and demolition sites with medium or high risk of dust impacts future reports will provide:

- Commentary text on any visual inspections undertaken.
- Commentary text on the relevant trigger level; currently 250 µg/m^3 as a 15 minute mean.
- A table of summary statistics for each monitoring site – max, min, mean concentrations of PM10, number of exceedances of the trigger level. For the monitors around LBE, these statistics are presented in Table 4 below.
- Line charts of monthly data from each monitor relevant to each site, with trigger level line is included in Appendix C.

Table 4 – Summary statistics – construction dust 15-minute indicative PM10 concentrations for March 2018

Worksite reference	Monitoring site ID	Mean 15-minute PM10 concentration (µg/m^3)	Minimum 15-minute PM10 concentration (µg/m^3)	Maximum 15-minute PM10 concentration (µg/m^3)	Number of 15-minute periods exceeding trigger level of 250 µg/m^3	15-minutedata capture (%)
S002-WS01	AQ023	14.0	0.7	152.70	0	82.0
S001-WS02	AQ025	13.4	0.4	82.20	0	72.3
S001-WS02	AQ026	15.8	0.5	99.40	0	75.7
S001-WS03	AQ027	18.2	0.5	139.10	0	78.6
S004-WS01	AQ028	16.9	0.7	70.30	0	99.9

4.2 Air quality around highways

Data summary

4.2.1 Table 5 below details the monitoring results from the NO_2 diffusion tube monitoring survey in LBE for the month of February 2018. This data is two months in arrears due to the time required for lab analysis.

4.2.2 Table 6 in Appendix C details NO_2 concentrations from diffusion tube monitoring for all previous months in 2018 and running mean (µg/m^3).

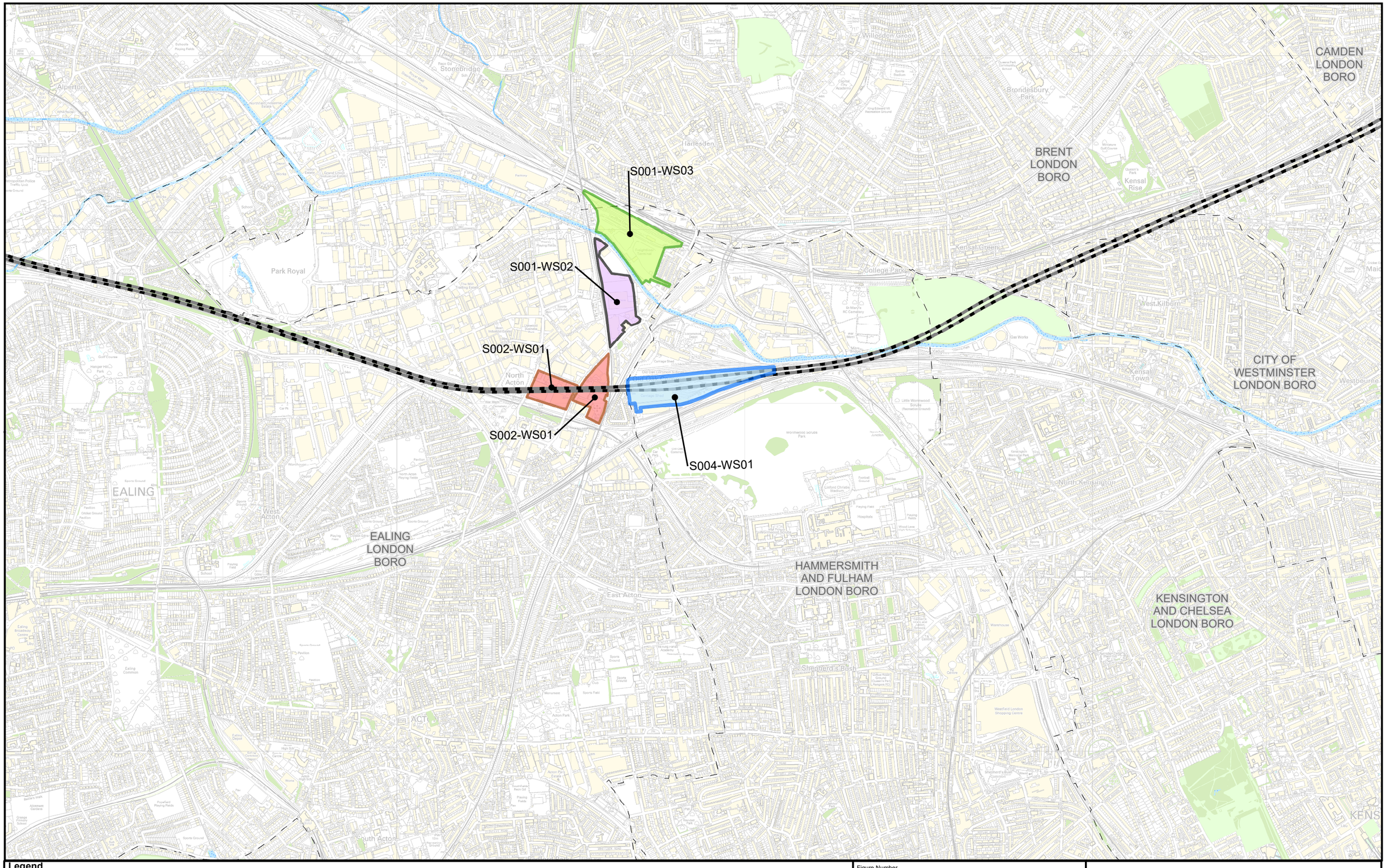
Table 5 - Monitoring results - air quality around highways

Monitoring Site ID	Location description	Provisional NO2 concentration for February 2018 (µg/m^3)
HS2-000020BN5	Sign post on Victoria Road	54
HS2-000020BN7	The Approach street sign	57
HS2-000020BQF	Conway Drive sign post	63
HS2-000020BQG	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	76
HS2-000020BP6	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	58
HS2-000020BP7	Triplicate site next to the Ealing, Hangar Lane Gyratory roadside automatic monitoring station	68

4.3 Complaints

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

Appendix A – Site locations



Legend

- Route in tunnel
- Route on surface
- Willesden Euro Terminal
- Atlas Road
- Victoria Road
- Old Oak Common

Figure Number

Figure Name

Work Site Locations

London Borough of Ealing

Scale at A3: 20,000

0 200 400 600 800

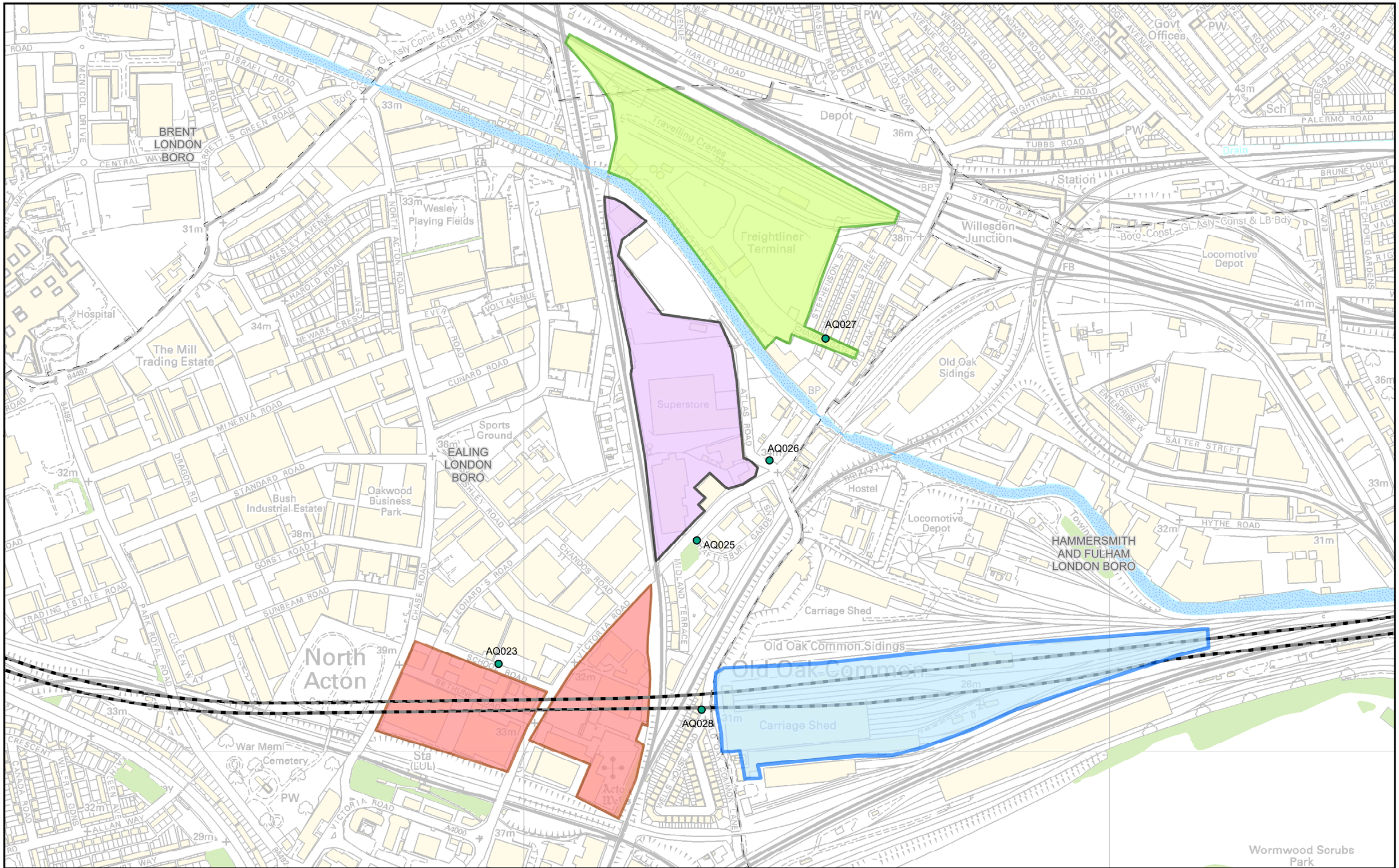
Metres

1EW02-CSJ-EV-REP-S000-000013_appA_fig1

Date: 20/04/18

Appendix B – Monitoring locations

Construction dust



Legend

- Route in tunnel
- Route on surface
- Construction Dust Monitoring Locations
- Willesden Euro Terminal
- Atlas Road
- Victoria Road
- Old Oak Common

Figure Number

Figure Name

Dust Monitoring Locations

London Borough of Ealing

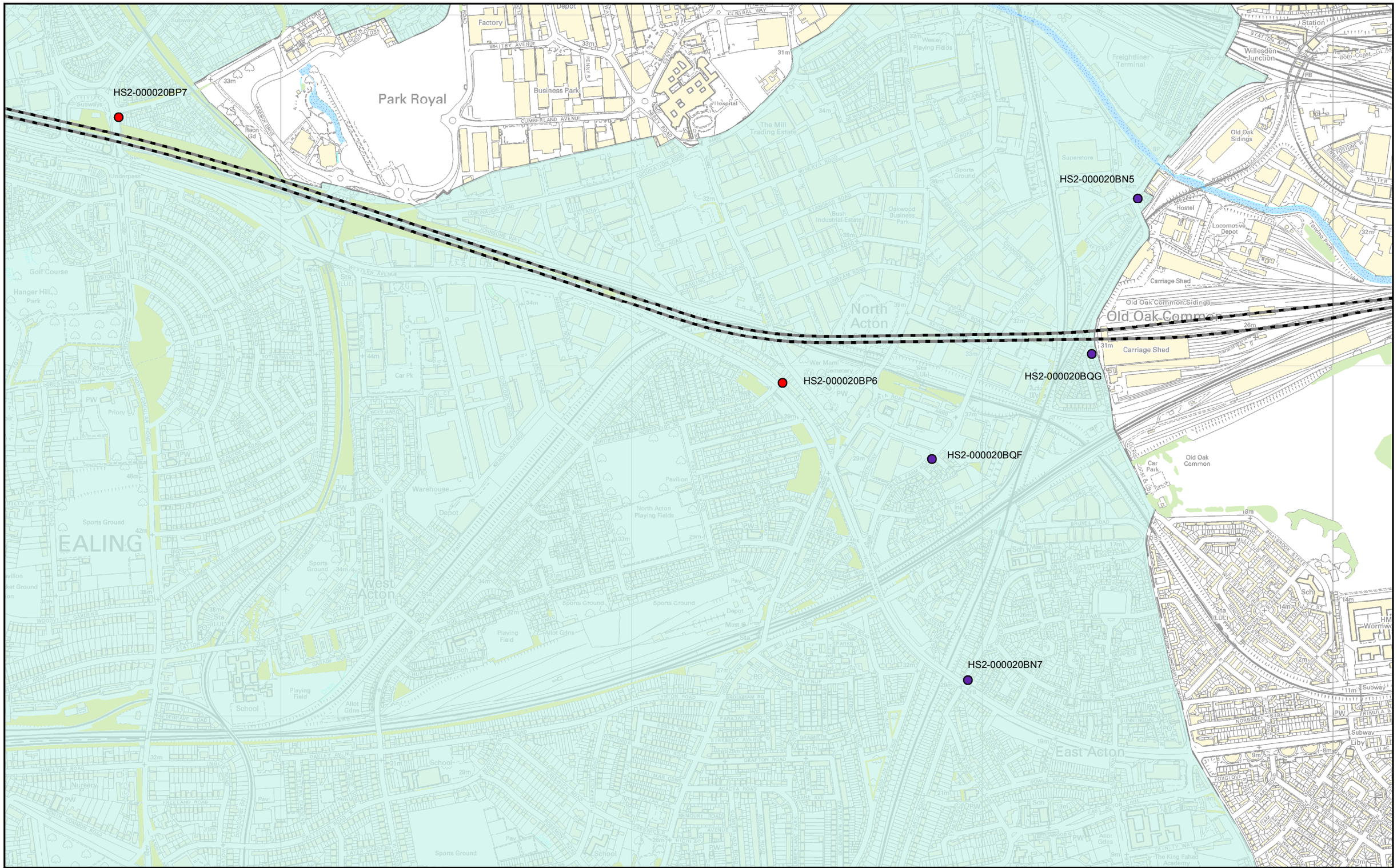
Scale at A3: 6,000

0 60 120 180 240 Metres

1EW02-CSJ-EV-REP-S000-000013_appA_fig1

Date: 20/04/18

Air quality around highways



Legend

- Route in tunnel
- Route on surface
- NO2 diffusion tube
- NO2 diffusion tube (co-located)
- Ealing Local Authority

Figure Number

Figure Name

Nitrogen dioxide tube monitoring site locations

London Borough of Ealing

Scale at A3: 10,000

0 100 200 300 400 Metres

Date: 11/12/17

Map Number: 1EW02-CSJ-EV-REP-S000-000015_appA_fig3

Appendix C – Monitoring data

Construction dust

Figure 4 – Construction dust 15-minute mean indicative PM10 concentration for monitor AQ023

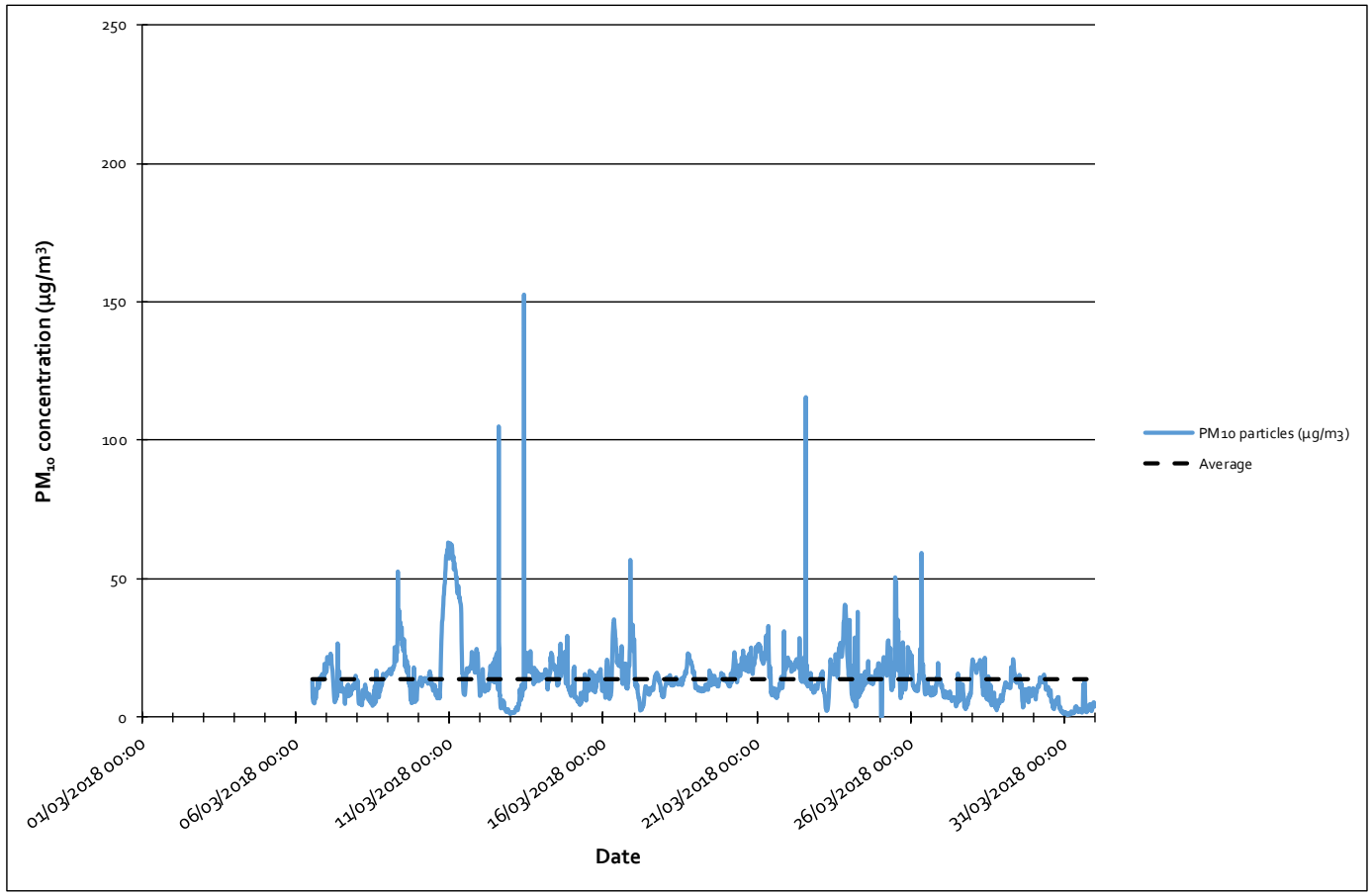


Figure 5 – Construction dust 15-minute mean indicative PM10 concentration for monitor AQ025

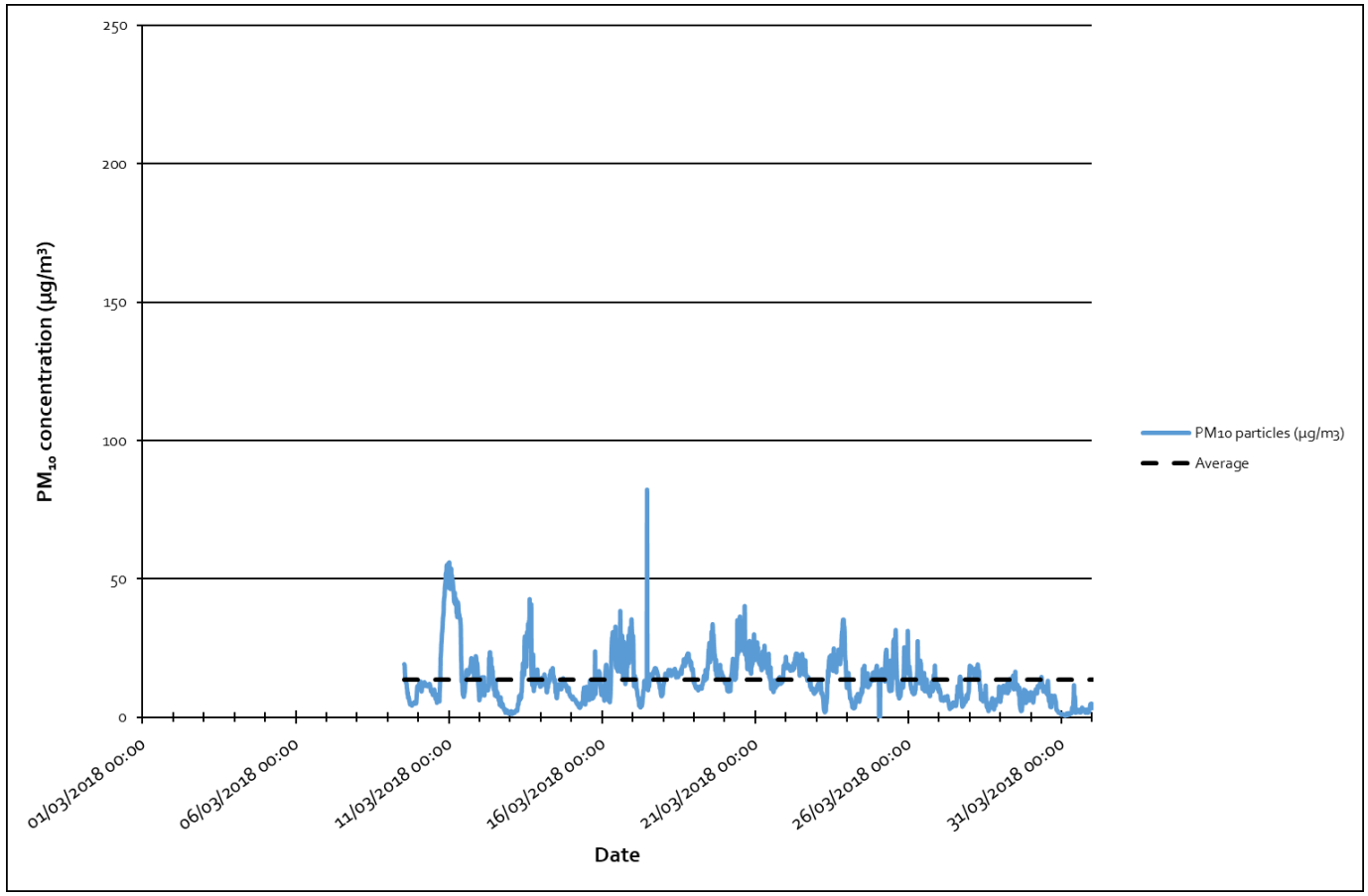


Figure 6 – Construction dust 15-minute mean indicative PM10 concentration for monitor AQ026

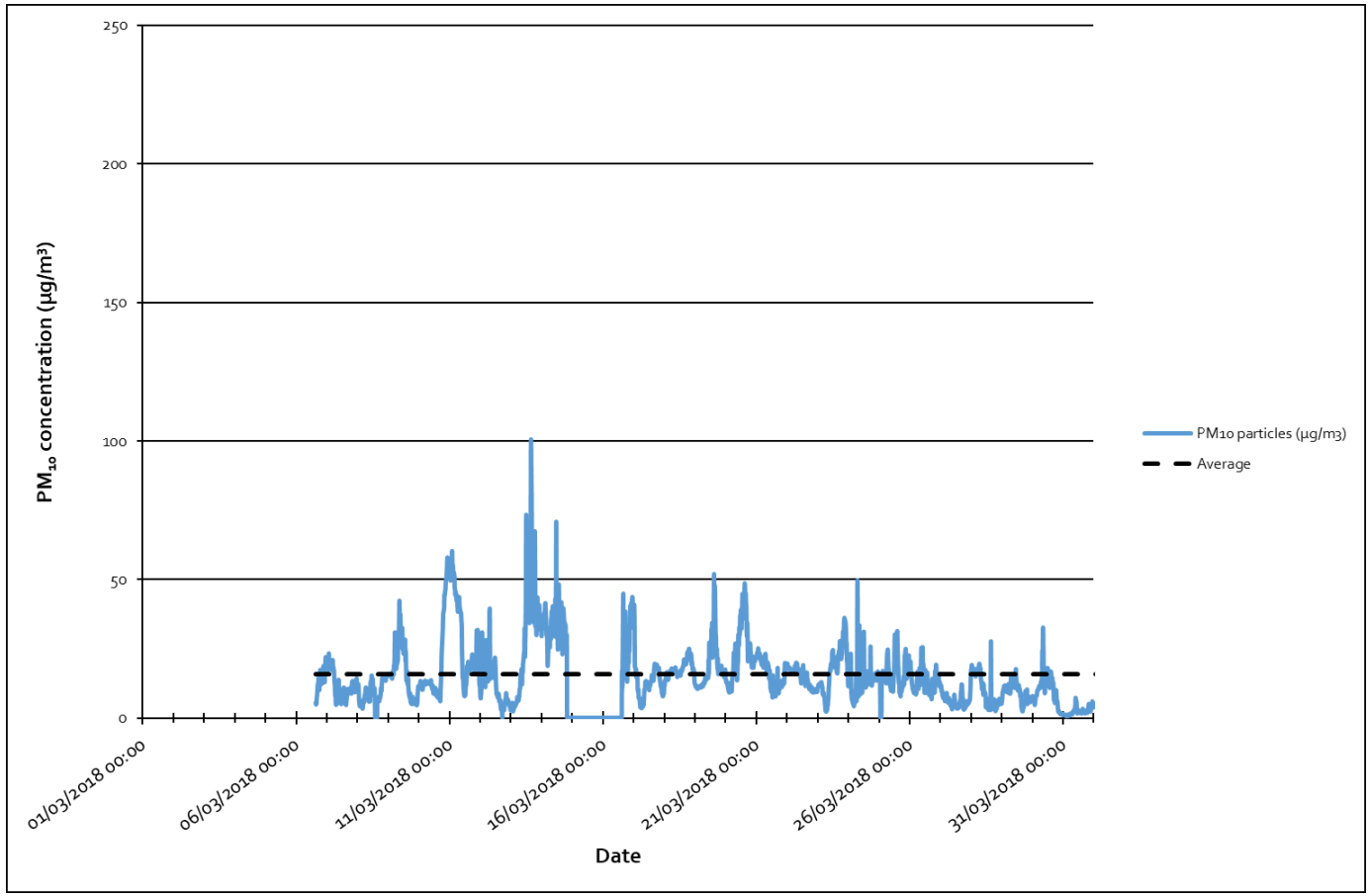


Figure 7 – Construction dust 15-minute mean indicative PM10 concentration for monitor AQ027

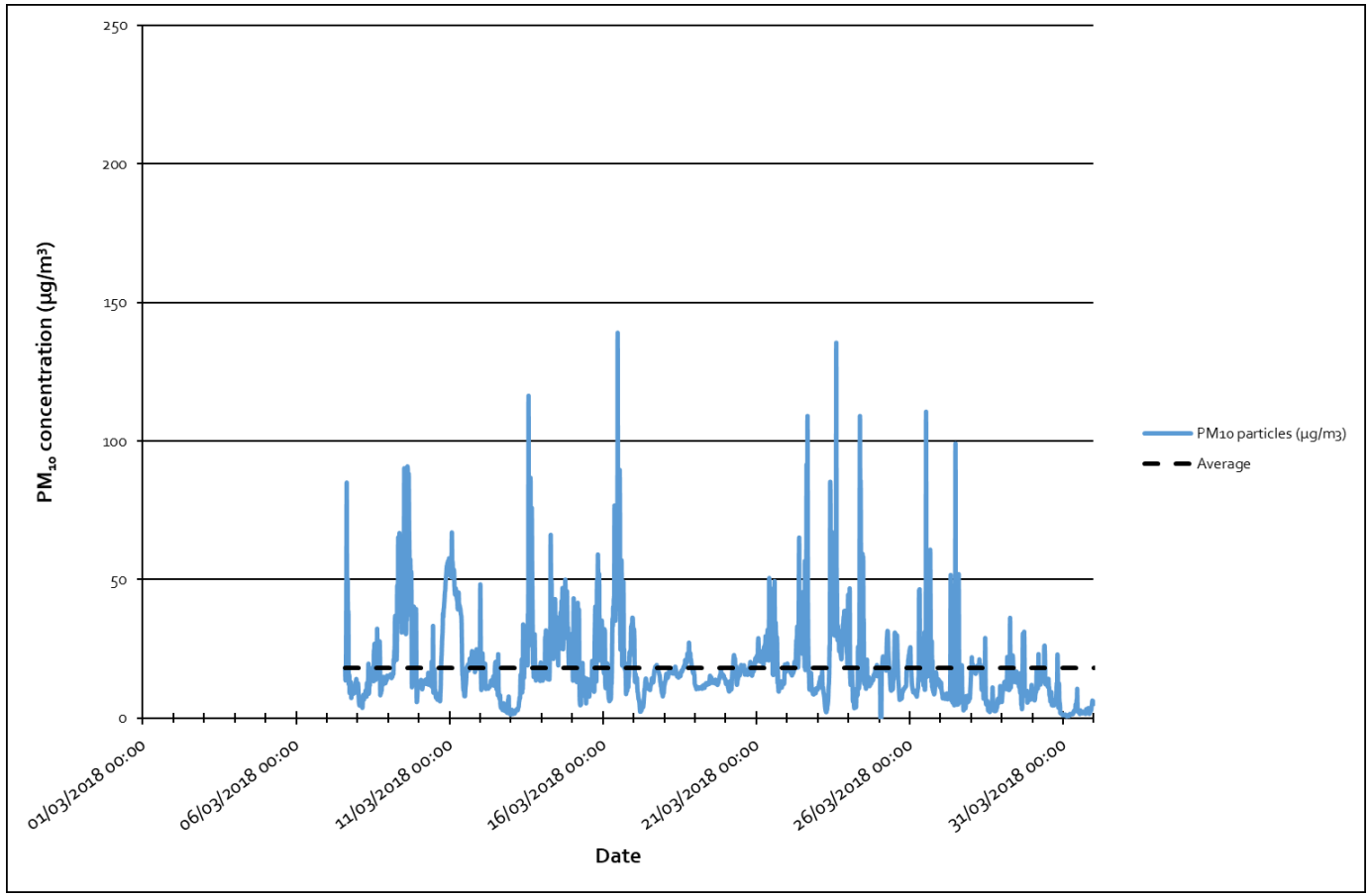
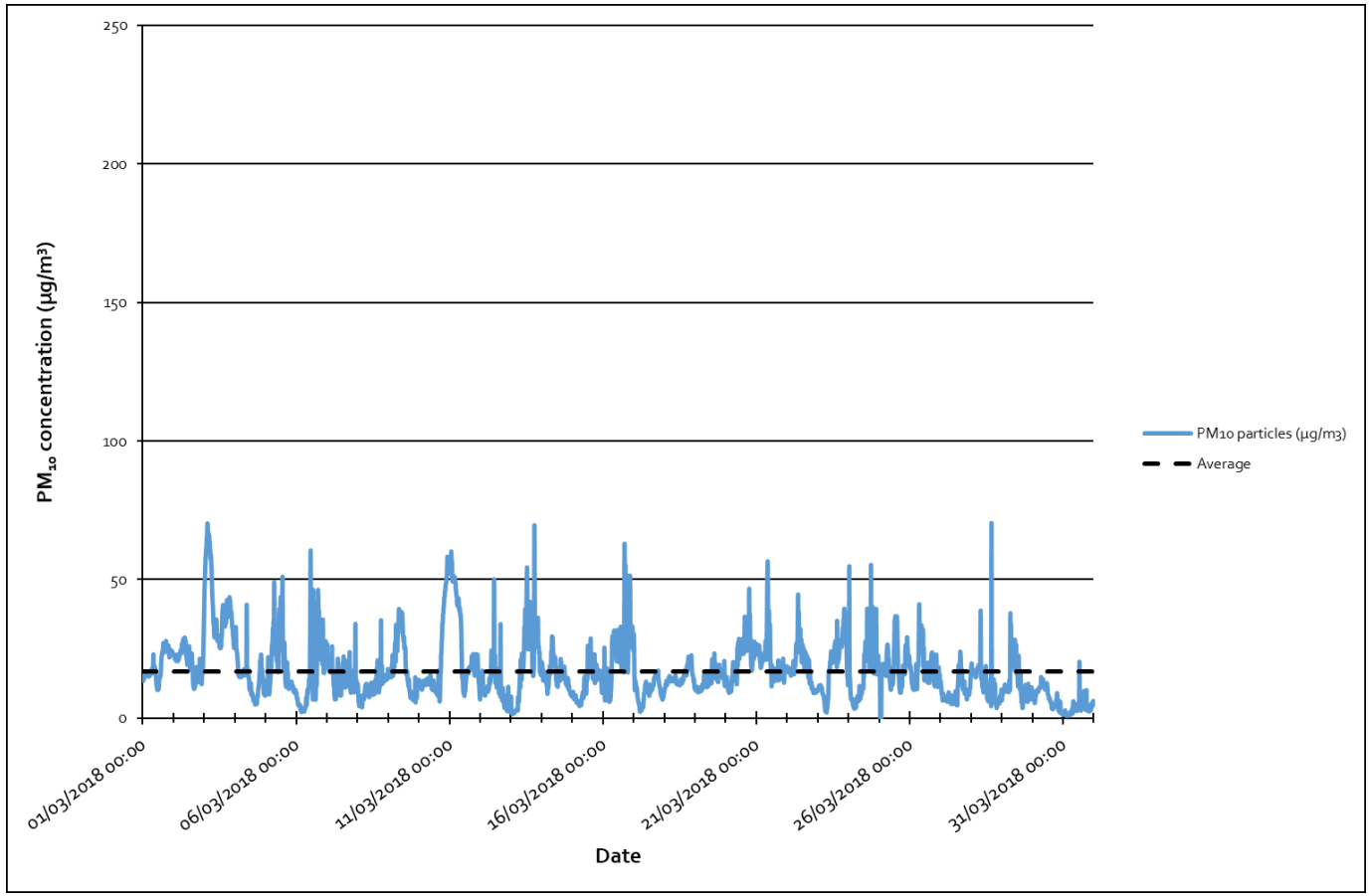


Figure 8 – Construction dust 15-minute mean indicative PM10 concentration for monitor AQ028



Air quality around highways

Table 6 - Air quality around highways NO_2 concentrations from diffusion tube monitoring all months and running mean (µg/m³) within LB Ealing

Monitoring Site ID	Location description	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018	Mean[2]
HS2-000020BN5	Sign post on Victoria Road	57	54											56
HS2-000020BN7	The Approach street sign	77	57											67
HS2-000020BQF	Conway Drive sign post	71	63											67
HS2-000020BQG	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	75	76											75
HS2-000020BP6	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	58	58											58
HS2-000020BP7	Triplicate site next to the Ealing, Hangar Lane Gyratory	76	68											72

[2] *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.*

Monitoring Site ID	Location description	Jan 2018	Feb 2018	Mar 2018	Apr 2018	May 2018	June 2018	Jul 2018	Aug 2018	Sep 2018	Oct 2018	Nov 2018	Dec 2018	Mean[2]
	roadside automatic monitoring station													

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