

## Air Quality Annual Report 2020



## 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 2020 Annual Air Quality Report focusses on the air quality monitoring undertaken in the 2020 calendar year across HS2. The reports detail the monitoring undertaken during the construction works on Phase One and details of the monitoring survey commissioned to provide information on the baseline situation on Phase 2a before construction works begin.

The High Speed Two project (HS2) is the Government's proposal for a new, high speed, north-south railway. HS2 Phase One will connect London with Birmingham and the West Midlands; Phase Two will extend the route to Manchester and beyond.

In November 2013, HS2 deposited a Hybrid Bill with Parliament to seek powers for the construction and operation of Phase One of HS2 (referred to as 'the Proposed Scheme'). The results of the Environmental Impact Assessment were reported in an Environmental Statement which was submitted alongside the Bill. On 23 February 2017 Royal Assent was granted for HS2 Phase One, creating the High Speed Rail (London – West Midlands) Act 2017.

In February 2019, the Supplementary Environmental Statement 2 and Additional Provisions 2 Environmental Statement (SES2 and AP2 ES) was submitted to Parliament in support of the High Speed Rail (West Midlands – Crewe) Bill (Phase 2a). AP2 ES reports any likely significant environmental effects of the proposed amendments made to the scheme having taken into account the environmental information in the main ES as updated by SES1 and SES2, where appropriate. On 11 February 2021 Royal Assent was granted for HS2 Phase 2a, creating the High Speed Rail (West Midlands - Crewe) Act 2021.

The HS2 Air Quality Strategy and HS2 Air Quality Information Papers, summarise the air quality effects identified in the Environmental Statement, as amended, and set out HS2's approach for managing air quality, which includes the publication of an annual review of air quality.

The first two annual reports published in 2018 (revised in 2019) focused on reporting monitoring data for air quality around highways and covered the 2016 period, based on 6 months of monitoring data and 2017 calendar year. These reports reviewed baseline conditions prior to the commencement of construction works.

The third and fourth annual report focused on reporting monitoring data for air quality around highways, covering the 2018 and 2019 calendar years respectively during the early stages of construction activity. This fifth report covers the 2020 calendar year, also during the early stages of construction activities in Phase One and baseline conditions prior to the commencement of works in Phase 2a. This report makes reference to the air pollutants and areas where significant effects were identified within the Environmental Statements, as amended. These significant effects along Phase One, for the pollutants nitrogen dioxide and particulate matter, are confined to a limited number of roads in the Greater London area. Potential significant effects in Phase 2a as a result of increased in nitrogen dioxide concentrations were identified at sensitive receptors close to the M6. Therefore, the

monitoring data discussed in this report covers the Greater London area for the pollutants nitrogen dioxide and particulate matter and locations close to the M6 for the pollutant nitrogen dioxide.

HS2 commenced a Phase One and Phase 2a baseline air quality survey at the end of June 2016 and January 2019 respectively. These surveys use diffusion tubes to monitor nitrogen dioxide. The monitoring and reporting of these surveys have been undertaken following the Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management best practice guidance. The results from this survey for 2020 are presented in table format in Appendix D and shown on maps, with monitoring sites colour coded based on the measured concentration, in Appendix G. Particulate matter monitoring around highways is available from sites operated by Defra or local authorities and a reference to the relevant reports, where this data is available, is provided. HS2 undertakes indicative monitoring of particulate matter for the purposes ensuring mitigations are effectively controlling dust emissions at high and medium risk construction sites, across the route.

The HS2 air quality monitoring survey is intended to supplement air quality monitoring that is being undertaken by other parties such as Defra, local authorities and in some areas, communities and academic institutions. Data from air quality monitoring surveys undertaken by other parties is not reproduced within this report.

This report provides a summary of the significant effects identified in the Environmental Statement, as amended, and a comparison of 2020 monitoring data with the predictions from the air quality modelling undertaken for the Environmental Statement.

During 2020 Phase One was in the early stages of construction, and no works had commenced along Phase 2a. HS2 have already made commitments for measures to reduce emissions generated by construction activities. The measures include:

- Construction vehicle emission standards and methods to manage their use via traffic management plans;
- Non-Road Mobile Machinery emission standards; and
- Dust mitigation measures.

The HS2 Information Papers for Air Quality (E31 for Phase One and E14 for Phase 2a) set out the HS2 emission standards for construction vehicles and Non-Road Mobile Machinery. The construction vehicle emission standards came into effect on 14 September 2017 with the commencement of early works, including ground investigation surveys, land preparation works, ecological surveys, etc. across Phase One.

Progress and a summary of the impact of these measures to improve air quality during 2020 in Phase One are set out in Section 4.2 and will therefore be reported across Phases in future annual reports. The 2020 monitoring survey was impacted by Covid-19 national wide lockdown measures and restrictions in that diffusion tubes were unable to be collected resulting in no data being available for the period March - May 2020 in Phase One, and March - July 2020 in Phase 2a.

The impacts of the national lockdowns did create a low traffic scenario which is evident in the lower air quality concentrations monitored through 2020. As lockdown restrictions are lifted, it is expected that air pollution concentrations will increase in line with that experienced in previous years.

HS2 continues to monitor air quality in line with the Local Air Quality Management requirements as set out in the HS2 Phase One Code of Construction Practice. HS2 has also been liaising with relevant local authorities that are introducing Clean Air Zones. Furthermore, HS2 has published an Air Quality Action Plan outlining the commitments made, and progress thereof in the management of the significant effects identified in the Environmental Statement, as amended.

# 1 Introduction

## 1.1 Background and Introduction

1.1.1 High Speed Two (HS2) is the Government's proposal for a new, high speed national railway. HS2 Phase One will connect London with Birmingham and the West Midlands; with Phase 2 planned to extend the route to Manchester, Leeds and beyond.

1.1.2 The high-speed railway project is divided into 3 phases:

- Phase One London to the West Midlands;
- Phase 2a West Midlands to Crewe; and
- Phase 2b Crewe to Manchester (the route serving the East Midlands, South Yorkshire and Leeds is being reviewed as part of the Integrated Rail Plan process).

1.1.3 In November 2013, HS2 deposited a Hybrid Bill with Parliament to seek powers for the construction and operation of Phase One of HS2. Royal Assent was granted for Phase One in February 2017. The results of the Environmental Impact Assessment (EIA) were reported in an Environmental Statement (ES), as amended, which was submitted alongside the Bill, which resulted in the Secretary of State publishing the Environmental Minimum Requirements (EMRs), including the Code of Construction Practise (CoCP), which set out the environmental and sustainability commitments that will be observed in the construction of the Proposed Scheme.

1.1.4 The ES, as amended, prepared as part of the Bill included an assessment of the impacts of the Proposed Scheme on air quality during both construction and operation. The HS2 Air Quality Strategy and HS2 Air Quality Information Papers<sup>1</sup> summarise the impacts identified in the ES, as amended.

1.1.5 The High Speed Rail (West Midlands - Crewe) Bill ('the Bill') was submitted to Parliament together with an ES ('the main ES') in July 2017. If enacted by Parliament, the Bill will provide the powers to construct, operate and maintain Phase 2a of HS2. Following the deposit of the Bill, the need for a number of amendments to the scheme (i.e. changes that require amendments to the Bill) was identified. These amendments were promoted in Parliament in March 2018 through an Additional Provision (referred to hereafter as 'AP1'), together with an ES ('the AP1 ES'). The AP1 ES was accompanied by a Supplementary ES ('the SES1'), which reported changes to the design which do not require amendments to the Bill, changes to construction assumptions, new environmental baseline information and corrections to the main ES.

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<sup>1</sup> HS2 Phase One Information Paper E31: Air Quality [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/672406/E31\\_-\\_Air\\_Quality\\_v1.5.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/672406/E31_-_Air_Quality_v1.5.pdf) and HS2 Phase 2a Information Paper E14: Air Quality [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/828982/E14\\_Air\\_Quality\\_v1.2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/828982/E14_Air_Quality_v1.2.pdf)



1.1.6 In February 2019, the Supplementary Environmental Statement 2 and Additional Provisions 2 Environmental Statement (SES2 and AP2 ES) was submitted to Parliament in support of the Bill (Phase 2a). AP2 ES reports any likely significant environmental effects of the proposed amendments made to the scheme having taken into account the environmental information in the main ES as updated by SES1 and SES2, where appropriate. On 11 February 2021 Royal Assent was granted for HS2 Phase 2a, creating the High Speed Rail (West Midlands - Crewe) Act 2021.

1.1.7 This 2020 Annual Air Quality Report focusses on monitoring undertaken in the 2020 calendar year during Phase One construction works and Phase 2a baseline survey.

1.1.8 One of the key impacts of Phase One, identified in the ES, as amended, were the impacts from construction traffic and highway interventions. These impacts were predicted to result in temporary significant effects, along a limited number of roads within the Greater London Area, on local air quality. These effects are mostly from changes in nitrogen dioxide (NO<sub>2</sub>) concentrations, and to a much less extent from variations in particulate matter (PM<sub>10</sub>).

1.1.9 Potential significant effects in Phase 2a, identified in the SES and AP2 ES, as a result of increased in nitrogen dioxide (NO<sub>2</sub>) concentrations were identified at sensitive receptors close to the M6. Potential significant effects were predicted across the following local authority areas:

- Stafford seven (7) locations;
- Newcastle-under-Lyme one (1) location; and
- Cheshire East one (1) location.

1.1.10 NO<sub>2</sub> concentrations in these areas were predicted to exceed the air quality standard even without the Proposed Scheme.

1.1.11 The identified significant effects are largely as a result of the existing concentrations of air pollutants within the Greater London and M6 area already being above government air quality standards.

## 1.2 Management of Air Quality

1.2.1 The HS2 Air Quality Strategy and HS2 Air Quality Information Papers, summarise the air quality effects identified in the Environmental Statement, as amended, and set out HS2's approach for managing air quality, which includes the publication of an annual review of air quality.

1.2.2 In order to manage significant impacts related to highway traffic changes and interventions, HS2 committed to putting in place a process to manage those impacts through measurement and regular assessments of air quality during the construction of

the Proposed Scheme. Where significant effects are predicted, action plans will be put in place with the objective of removing those significant effects.

- 1.2.3 The HS2 Air Quality Action Plan (published in June 2019), is the first report that presents all the measures HS2 has committed to provide in relation to air quality, forming the baseline against which performance is compared in future years of construction and operation.
- 1.2.4 The management process is modelled on Defra's Local Air Quality Management (for which the statutory duties of local authorities and London boroughs are set out in Part IV of the Environment Act 1995), and the periodic reviews and action plans are envisaged as being similar to those produced in that process.
- 1.2.5 The management process comprises of measure – review – action plan. Baseline (pre-works) air quality monitoring is being undertaken in locations where potential significant effects have been predicted. Forecast baseline and 'with HS2 construction' traffic numbers used in the air quality modelling for the ES will be reviewed and updated in these locations, if necessary.
- 1.2.6 The baseline measurements will be reviewed, and an air quality assessment produced at appropriate stages of construction to determine whether significant effects are still predicted. Where significant effects are still predicted, the air quality monitoring will be continued, and an air quality action plan be developed, with the objective of removing the significant effects as soon and as far as practicable.

## 1.3 Purpose of this report

- 1.3.1 The first two annual reports published in 2018 (revised in 2019) focused on reporting monitoring data for air quality around highways and covered the 2016 period, based on 6 months of monitoring data and 2017 calendar year. These reports reviewed baseline conditions prior to the commencement of construction works<sup>2</sup>.
- 1.3.2 The third and fourth annual report focused on reporting monitoring data for air quality around highways, covering the 2018 and 2019 calendar years respectively, during the early stages of construction activity. This fifth report covers the 2020 calendar year, also during the early stages of construction activities in Phase One and baseline conditions prior to the commencement of works in Phase 2a. This report provides a comparison with the information previously presented in the main ES air quality chapters.
- 1.3.3 This annual report is focused on reporting monitoring data for air quality around highways. The air pollutants considered in this report are NO<sub>2</sub> and particulate matter (PM). The area of focus is where significant effects were identified within the ES. These areas

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<sup>2</sup> In some areas, survey work and ground investigation works were undertaken during 2016/2017. In addition, in the London Borough of Camden construction of housing to replace that which will be lost due to land required by HS2 was under construction during 2016/2017.

were within Greater London and at sensitive receptors along the M6 in Phase 2a, as such the reporting of monitoring data is for these areas only. For other areas along the route, data from Defra and local authority monitoring surveys provides an indication of baseline. This data is not reproduced in this report and reference should be made to the relevant Defra and local authority publications and websites.

1.3.4 The 2020 monitoring survey was impacted by Covid-19 national wide lockdown measures and restrictions in that diffusion tubes were unable to be collected resulting in no data being available for the period March - May 2020 in Phase One, and March - July 2020 in Phase 2a.

1.3.5 The impacts of the national lockdowns did create a low traffic scenario which is evident in the lower air quality concentrations monitored through 2020. As lockdown restrictions are lifted, it is expected that air pollution concentrations will increase in line with that experienced in previous years.

## **1.4 Summary of significant effects identified in the Environmental Statement**

1.4.1 For the ES, calculations of changes in concentrations of nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>) were calculated. PM<sub>2.5</sub> concentrations were considered. The ES predicted that changes in traffic emissions during construction of the Proposed Scheme would give rise to significant effects from changes in annual mean NO<sub>2</sub> concentrations around certain construction traffic routes in the Greater London area in Phase One, and along the M6 in Phase 2a. Significant effects from changes in the 24-hour daily mean PM<sub>10</sub> concentrations were also predicted, but this was limited to the area in the immediate vicinity of Euston Road in London.

1.4.2 For the ES, best practice guidance published by the Institute of Air Quality Management (IAQM) was used to determine if there were significant impacts anticipated for air quality. This guidance determines the significant effect based on the change in pollutant concentration due to the Proposed Scheme relative to pollutant concentration for the baseline situation. Where the existing air quality is already above government air quality standards, a relatively smaller change in pollution concentration is considered to be a significant effect, than where existing air quality is below government air quality standards.

1.4.3 Where an effect on air quality is described as significant at a particular location, with respect to the air quality legislation, this does not denote a significant effect on human health. Much larger changes in air quality than what is predicted as a consequence of the Proposed Scheme would be needed to cause significant impacts on health at the level of an individual person.

1.4.4 A summary of the number of receptors with significant effects predicted in the Phase One ES are presented in Appendix A.

## 2 Air Quality monitoring data and comparison with the Air Quality Objectives and National Compliance

### 2.1 Pollutants

2.1.1 The main pollutants of concern for local air quality in relation to road traffic emissions are NO<sub>2</sub> and particulate matter (PM). Further details of each of these pollutants is given below.

#### Nitrogen dioxide (NO<sub>2</sub>)

2.1.2 Nitrogen dioxide (NO<sub>2</sub>) is a secondary pollutant produced by the oxidation of nitric oxide (NO). NO and NO<sub>2</sub> are collectively termed nitrogen oxides (NO<sub>x</sub>). Almost a third of the UK NO<sub>x</sub> emissions are from road transport. The majority of NO<sub>x</sub> emitted from vehicles is in the form of NO, which oxidises rapidly in the presence of ozone (O<sub>3</sub>) to form NO<sub>2</sub>. In high concentrations, NO<sub>2</sub> can affect the respiratory system and can also enhance the response to allergens in sensitive individuals, whereas NO does not have any observable effect on human health at the range of concentrations found in ambient air. Elevated concentrations of oxides of nitrogen can have an adverse effect on vegetation, including leaf or needle damage and reduced growth. Deposition of pollutants derived from oxides of nitrogen emission contribute to acidification and/or eutrophication of sensitive habitats.

#### Particulate Matter (PM)

2.1.3 The principal sources of particles in the UK are combustion processes, which include traffic and industry. Particulate matter in vehicle exhaust gases consists of carbon nuclei onto which a wide range of compounds are absorbed. These particles have an effective aerodynamic diameter of less than 10 micrometres (µm). Particles in this size range are referred to as PM<sub>10</sub>. Finer size fractions are referred to as PM<sub>2.5</sub>. These particles have an effective aerodynamic diameter of less than 2.5µm. Diesel engines produce the majority of particulate emissions from the vehicle fleets. Approximately an eighth of primary PM<sub>10</sub> emissions in the UK are derived from road transport<sup>3</sup>. Particulate matter is associated with a range of symptoms of ill health including effects on the respiratory and cardiovascular systems, on asthma and on mortality.

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<sup>3</sup> National Atmospheric Emissions Inventory (NAEI), BEIS (2019) <https://naei.beis.gov.uk/>

## 2.2 Summary of relevant legislation

2.2.1 Air quality monitoring data has been compared against limit values and objectives set out in the following legislation:

- The Air Quality (England) Regulations 2000<sup>4</sup>, Air Quality (England) (Amendment) Regulations 2002<sup>5</sup>, the Air Quality Standards Regulations 2010<sup>6</sup> and the Air Quality Standards (Amendment) Regulations 2016<sup>7</sup>; and
- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe<sup>8</sup>.

2.2.2 Air quality limit values and objectives are quality standards that have been set for clean air and to protect human health. Some pollutants have standards expressed as annual average concentrations and others have standards expressed as 24-hour, 1-hour or 15-minute average concentrations. Some pollutants have standards expressed in terms of both long-term and short-term concentrations.

2.2.3 Table 1 sets out the EU air quality limit values and UK national air quality objectives for the pollutants NO<sub>2</sub> and PM<sub>10</sub> for which significant effects were identified. PM<sub>2.5</sub> is also included for completeness. Within this report, the term 'air quality standards' refers to both the English air quality objectives and the air quality limit values introduced in the UK based on EU Directives.

Table 1: Relevant air quality standards

Pollutant	Averaging Period	Air Quality Standards
Nitrogen dioxide (NO <sub>2</sub> )	1-hour mean	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year
	Annual mean	40 µg/m <sup>3</sup>
PM <sub>10</sub>	24-hour mean	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year
	Annual mean	40 µg/m <sup>3</sup>
PM <sub>2.5</sub>	Annual mean	25 µg/m <sup>3</sup> to be achieved by 2020
	3-year mean	Target of 15% reduction in concentration at urban background locations to be achieved between 2010 and 2020.

<sup>4</sup> Department for Environment, Food and Rural Affairs, 2000, The Air Quality (England) Regulations 2000, The Stationery Office

<sup>5</sup> Department for Environment, Food and Rural Affairs, 2002, The Air Quality (England) (Amendment) Regulations 2002, The Stationery Office

<sup>6</sup> Department for Environment, Food and Rural Affairs, 2010, The Air Quality Standards Regulations 2010, The Stationery Office

Department for Environment, Food and Rural Affairs, 2016, The Air Quality Standards (Amendment) Regulations 2016, The Stationery Office

<sup>7</sup> Department for Environment, Food and Rural Affairs, 2016, The Air Quality Standards (Amendment) Regulations 2016, The Stationery Office

<sup>8</sup> Official Journal of the European Union, 2008, Directive 2008/50/EC of the European Parliament and of the Council of the 21 May 2008 on ambient air quality and cleaner air for Europe, EU

## 2.3 Summary of monitoring undertaken by HS2

- 2.3.1 All HS2 air quality monitoring surveys are intended to supplement air quality monitoring that is being undertaken by other parties such as Defra, local authorities and in some area's communities and academic institutions. Data from surveys undertaken by other parties is not reproduced within this report.
- 2.3.2 HS2 commenced a Phase One and Phase 2a baseline air quality survey at the end of June 2016 and January 2019 respectively in locations where there were predicted to be significant effects on air quality around highways. This baseline air quality survey measured annual mean NO<sub>2</sub>, for which potential significant effects were predicted around certain construction traffic routes in the Greater London area and certain locations adjacent to the M6. The Phase One survey has continued throughout the initial enabling works phase and will be continued into the main works construction phase. The Phase 2a baseline survey ran from January to December 2019.
- 2.3.3 In relation to where significant effects were identified for PM<sub>10</sub> for air quality around highways, supplementary surveys are not being undertaken as existing monitoring sites operated by Defra and/or local authorities are considered to give sufficient coverage<sup>9</sup>.

## 2.4 Summary of NO<sub>2</sub> monitoring methodology

- 2.4.1 A survey of NO<sub>2</sub> concentrations using diffusion tubes commenced at the end of June 2016 for locations within Greater London, and at the beginning of January 2019 for locations along the M6 along the Phase 2a route. The surveys were planned, installed and is operated in accordance with Defra Local Air Quality Management Technical Guidance 2016 (LAQM.TG(16))<sup>10</sup>.
- 2.4.2 The sites selected for inclusion in the survey comprise of:
- Locations where the ES predicted significant effects;
  - Co-located locations at pre-existing long-term continuous monitoring sites, operated to European Union reference method standards for bias adjustment; and
  - Background and roadside sites where significant effects were not predicted to provide control locations not expected to be affected by the Proposed Scheme.
- 2.4.3 Diffusion tubes are a passive monitoring method, that has the benefit of not requiring mains power and can be deployed over a large number of locations. In accordance with Defra LAQM.TG(16) guidance, diffusion tubes are exposed for a 4 or 5 week period depending on the length of the month. The diffusion tubes are then collected and

<sup>9</sup> HS2 are undertaking surveys of indicative PM<sub>10</sub> for the purposes of management of construction dust

<sup>10</sup> Department for Environment, Food and Rural Affairs, 2018, Local Air Quality Management Technical guidance. Available at: <https://laqm.defra.gov.uk/technical-guidance/>

returned to the laboratory for analysis at the end of each month and new diffusion tubes are deployed for the next month.

- 2.4.4 In accordance with Defra LAQM.TG(16) guidance, NO<sub>2</sub> diffusion tube surveys aim for a minimum data capture of 75% for each site for each year of the survey (i.e. there needs to be 9 out of 12 months with valid data at each site). This gives some allowance for the diffusion tube at a site to go missing or be damaged for a given month.
- 2.4.5 Where data capture over the year is less than 75% a process of annualisation can be applied in accordance with Defra LAQM.TG(16) guidance to calculate an annual mean equivalent for the site based on the comparison of the months with available data against a full dataset for a long term fixed continuous monitoring site operated by Defra or local authorities.
- 2.4.6 A process of bias adjustment is also undertaken each year. Triplicate sets of diffusion tubes are co-located at long term fixed continuous monitoring sites operated by Defra or local authorities. The average concentration from the triplicate diffusion tubes is compared to the concentrations measured at the long term fixed continuous monitoring site and a correction factor is applied to all sites in the survey to bring these into line with the long term fixed continuous monitoring site.
- 2.4.7 Details of the diffusion tube locations included in the HS2 air quality monitoring surveys are given in the table in Appendix B and maps in Appendix G.
- 2.4.8 The diffusion tubes used for the survey period between January and October 2020 in Phase One and January to December 2020 in Phase 2a were supplied by Gradko Environmental. The diffusion tubes used in Phase One for the period between November and December 2020 were supplied by SOCOTEC UK Limited. The diffusion tube preparation used was 20% triethanolamine (TEA) in de-ionised water<sup>11</sup>.

### Calculation of the annual mean NO<sub>2</sub> concentration

- 2.4.9 Data collected with the diffusion tubes for the January to December 2020 period were annualised and bias adjusted in accordance with Defra LAQM.TG(16) guidance.
- 2.4.10 Continuous monitoring data, used to annualise and bias adjust diffusion tube data, were downloaded from [www.londonair.org.uk](http://www.londonair.org.uk) and [www.airqualityengland.co.uk](http://www.airqualityengland.co.uk).
- 2.4.11 Diffusion tube data for January to December 2020 were annualised in line with Defra LAQM.TG(16) guidance. The background <sup>12</sup> continuous monitoring sites Camden –

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<sup>11</sup> The Gradko 20% TEA in water diffusion tubes have a grey cap. The SOCOTEC diffusion tubes contain 20% TEA in de-ionised water and have a black cap.

<sup>12</sup> Site location type are defined in Defra LAQM.TG(16):

- Kerbside sites are within one metre of the kerb of a busy road.
- Roadside sites are typically within one to five metres of the kerb of a busy road (although distance can be up to 15 m from the kerb in some cases).



Bloomsbury and Kensington and Chelsea – North Kensington were used to derive an annualisation factor for the Phase One data set. As there were no local continuous monitors to co-locate with for the Phase 2a survey, two relevant continuous urban background sites have been used for annualisation, including Stoke-on-Trent and Walsall Woodlands.

2.4.12 Phase One bias adjustment factors for background, roadside and kerbside locations were derived using Defra's local bias adjustment factors spreadsheet<sup>13</sup>. Bias adjustment factors were derived using the data from diffusion tubes co-located with automatic monitoring sites. The background sites used were Camden – Bloomsbury and Kensington and Chelsea – North Kensington. The roadside sites used were, Camden – Euston Road, Ealing – Hanger Lane, Ealing – Western Avenue, and Hillingdon – South Ruislip. The kerbside sites used were Camden – Swiss Cottage and Westminster – Marylebone Road. Further details on the continuous monitoring sites are available at [www.londonair.org.uk](http://www.londonair.org.uk) and at [www.airqualityengland.co.uk](http://www.airqualityengland.co.uk). The precision of the tubes (the difference between the triplicate tubes at each location) was represented by calculating the coefficient of variation. It is considered that if the average coefficient of variation is below 10 percent, the survey is of good precision. All sites were found to have good precision and therefore all sites were used for bias adjustment.

2.4.13 As there were no local continuous monitors for co-location of diffusion tubes in Phase 2a, the national bias adjustment factor was used for this survey analysis. The national bias adjustment factor for the latest published year (2019) was 0.91; the annual concentrations for all sites were therefore adjusted by multiplying by this factor.

2.4.14 Full details of the annualisation and bias adjustment factors calculated are presented in Appendix C.

## 2.5 HS2 NO<sub>2</sub> survey monitoring results

2.5.1 Full monitoring results for the air quality NO<sub>2</sub> diffusion tube surveys are presented in the tables in Appendix D and maps in Appendix G.

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• Background sites in urban areas are distanced from sources and therefore broadly representative of city-wide background conditions, such as urban residential areas.

<sup>13</sup> Department of Environment, Food and Rural Affairs, 2011, local bias adjustment factors spreadsheet version 04. Available at: <https://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html>



## 2.6 Particulate Matter monitoring results

- 2.6.1 HS2 has not undertaken supplementary surveys for particulate matter around highways, as existing monitoring sites operated by Defra and/or local authorities are considered to give sufficient coverage for the areas over which significant effects were identified. The most recent monitoring data from relevant Defra and local authority monitoring sites are presented in the London Air Quality Network Summary Report 2018<sup>14</sup>, available at [www.londonair.org.uk](http://www.londonair.org.uk). The relevant monitoring sites are Camden – Bloomsbury, Camden – Euston Road, Camden – Swiss Cottage, Ealing – Hanger Lane, Ealing – Western Avenue, Kensington and Chelsea – North Kensington, Westminster – Marylebone Road and Hillingdon – South Ruislip (data for this site can be viewed and downloaded from [www.airqualityengland.co.uk](http://www.airqualityengland.co.uk)).
- 2.6.2 Dust is measured at appropriate locations at the construction site boundary and/or at sensitive receptors using instruments that provide continuous measurement of particulate matter as PM<sub>10</sub>. As a minimum standard of measurement uncertainty, these instruments are certified through MCERTS as being indicative ambient particulate monitors. Monitoring is only undertaken at High or Medium dust risk sites, as determined through the Institute of Air Quality Monitoring (IAQM) Guidance on the assessment of dust from demolition and construction<sup>15</sup>.
- 2.6.3 Where monitoring is undertaken, monthly summary reports are produced and published at <https://www.gov.uk/government/collections/monitoring-the-environmental-effects-of-hs2> providing commentary on visual inspections and relevant trigger levels, and summary statistics for each monitoring site including max, min, mean, number of exceedances of the trigger level and line charts of monthly data relevant to the trigger level. The trigger level is set in accordance with the IAQM Guidance on monitoring in the vicinity of demolition and construction sites<sup>16</sup>.

<sup>14</sup> Kings College London, 2019, London Air Quality Network Summary Report 2018, October 2019.

<sup>15</sup> IAQM Guidance on the assessment of dust from demolition and construction (Version 1.1 - 2014) <https://iaqm.co.uk/text/guidance/construction-dust-2014.pdf>

<sup>16</sup> IAQM Guidance on Monitoring in the Vicinity of Demolition and Construction Sites (Version 1.1 – 2018)

## 3 Comparison to predictions in the Environmental Statement

### 3.1 Phase One

3.1.1 Appendix E presents a comparison between the calculated 2020 results, the modelled prediction for peak NO<sub>2</sub> annual mean concentrations from the ES for the scenario without and with the Proposed Scheme respectively in place<sup>17</sup>. Appendix F presents a comparison between the Phase One 2020 and previous years' monitored results.

3.1.2 This is an indicative comparison rather than an absolute one. There may be differences in the characteristics of the individual diffusion tube locations and the nearest receptor location assessed in the ES. For instance, receptor locations assessed in the ES were typically at the facades of properties adjacent to roads affected by the Proposed Scheme. However, due to the need to be able to access the sites to mount the diffusion tubes on a monthly basis they have typically been located on publicly accessible street furniture such as lampposts and signposts. The diffusion tube locations are intended to be representative of exposure locations along roads where significant effects were predicted during construction. In some instances, they are closer to roads than the locations where the public would typically be exposed.

3.1.3 Where comparisons of monitoring data and modelling prediction results are undertaken, Defra LAQM.TG(16) guidance suggests that if the difference is less than  $\pm 25\%$  then the comparison can be considered acceptable.

3.1.4 The 2017 'without scheme' comparison of the monitored results indicates that:

- Of the 113 locations where monitoring was undertaken in 2020, monitored concentrations from 8 tubes were within  $\pm 25\%$  of the modelled concentrations.
- Where the comparison has a difference of more than  $\pm 25\%$ :
  - Modelled concentrations were higher than the monitored concentrations for 84 sites (74% of the overall sites), which were typically associated with locations on side streets away from major roads, and the impacts of Covid-19 lockdown restrictions reducing traffic volumes.
  - A further 21 tubes are not located in proximity to modelled receptors and thus have not undergone a comparison.

3.1.5 The 'with scheme' comparison of the data from the closest representative modelled scenario from the main ES indicates that:

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<sup>17</sup> Modelled annual mean NO<sub>2</sub> results are from the SES2 and AP3 Environmental Statement for locations east of the Edgware Road and from the SES and AP2 Environmental Statement for all other sites (predictions without Proposed Scheme concentrations are identical for the SES and AP2 and the SES3 and AP4 Environmental Statements).

- Of the 113 locations where monitoring was undertaken in 2020, monitored concentrations from 8 tubes were within  $\pm 25\%$  of the modelled concentrations.
- Where comparison has a difference of more than  $\pm 25\%$ :
  - Modelled concentrations were higher than the monitored concentrations for 84 sites (74% of the overall sites), which were typically associated with locations on side streets away from major roads, and the impacts of Covid-19 lockdown restrictions reducing traffic volumes.
  - A further 21 tubes are not located in proximity to modelled receptors and thus have not undergone a comparison.

3.1.6 The key reasons for differences in the 2020 monitored annual mean NO<sub>2</sub> concentrations and the modelled annual mean NO<sub>2</sub> concentrations are as follows:

- For the ES modelling there was a more limited number of air quality monitoring sites available for model verification at the time the air quality modelling for the ES was undertaken;
- These sites were typically adjacent to high traffic roads recording concentrations well in excess of air quality standards;
- During 2020, due to the Covid-19 national lockdown measures and restrictions implemented there was a significant downturn in vehicle movements;
- Monitoring sites representative of areas away from high traffic roads were limited so model performance in these areas could not be determined;
- This resulted in over adjustment of the air quality model for the locations away from high traffic roads and therefore higher predicted concentrations;
- For areas adjacent to high traffic flow roads and subject to congestion, the air quality modelling undertaken for the ES was not able to fully reflect the impacts of congestion<sup>18</sup>; and
- Policy changes and public awareness around Air Quality issues and concerns (i.e. in preparation for the London Low Emission Zone which came into effect in April 2019 and Ultra-Low Emission Zone and ahead of the implementation in October 2021).

3.1.7 The ES determined significance of the air quality impacts based on the change in concentration relative to the modelled without Proposed Scheme concentrations. This approach and the relevant parameters to apply are set out in the Institute of Air Quality Management guidance, Planning for Air Quality (2017).

3.1.8 For the locations away from major roads where the modelled concentrations are higher than those monitored, then the modelling required a smaller change in concentrations due to the Proposed Scheme to give a significant effect. On this basis the modelling for the ES gave a worst-case view of the significant effects due to the Proposed Scheme.

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<sup>18</sup> Where there is congestion the real-world speeds of traffic are typically lower than those that are used in the air quality model. A very detailed level of modelling is required to reflect congestion in an air quality model, which was not possible for the ES due to the large geographic area over which the air quality assessment was undertaken.

3.1.9 For locations adjacent to high traffic flow roads, where the monitored concentrations were higher than the modelled concentrations, the modelled concentrations were higher than air quality standards so the changes in concentrations required for a significant effect is already small. On this basis the modelling or the ES did not underestimate the significant effects due to the Proposed Scheme for these locations.

3.1.10 Of the 113 diffusion tube monitoring locations in 2020, 112 locations indicated a reduction in monitored concentrations between 2019 and 2020, with 1 location indicating a slight increase in monitored concentrations (this 1 location had limited data which is likely the reason for the increase seen). The number of locations at which the monitored concentrations exceeded the Air Quality Objective decreased between 2019 and 2020. No additional locations are reporting an exceedance with the Air Quality Objective. Eleven (11) new locations noted compliance with the Air Quality Objective when compared to the 2019 monitoring results.

## 3.2 Phase 2a

3.2.1 Appendix E presents the Phase 2a 2020 baseline monitored results. There were ten (10) monitoring sites installed across the three study areas close to the M6 in Stafford, Newcastle-under-Lyme and Cheshire East, including:

- South-west of Stafford: eight (8) sites;
- Madeley Health: one (1) site; and
- Oakhanger: one (1) site.

3.2.2 Measurements of NO<sub>2</sub> concentrations were obtained on a monthly basis in 2020 and analysis was undertaken to compare data collated against the annual mean air quality standard of 40µg/m<sup>3</sup>.

3.2.3 Measured NO<sub>2</sub> concentrations were well below the annual mean air quality standard of 40µg/m<sup>3</sup> at all sites.

3.2.4 During 2020, due to the Covid-19 national lockdown measures and restrictions implemented there was a significant downturn in vehicle movements.

## 4 Actions to improve air quality

### 4.1 Proposed actions

4.1.1 In developing an air quality action plan for the Proposed Scheme HS2 have already made commitments to measures to reduce emissions generated by construction activities. These measures are set out in the HS2 Phase 1 Code of Construction Practice (CoCP) and HS2 Air Quality Information Papers (E31: Phase One and E14: Phase 2a).

4.1.2 These measures include:

- Construction vehicle emission standards requirements and methods to manage their use via traffic management plans;
- Non-Road Mobile Machinery (NRMM) emission standard requirements; and
- Dust mitigation measures as set out in the CoCP.

### 4.2 Phase One progress and impact of measures to address Air Quality

4.2.1 Phase One is still currently in the early stages of the construction period. The year 2016 is considered a baseline period. The year 2017 also provides further baseline data due to the limited number of construction activities occurring during the year. The years 2018 and 2019 are representative of the enabling works and therefore early construction.

4.2.2 Phase One Information Paper E31: Air Quality sets out the HS2 emission standards for construction vehicle emissions, NRMM and dust management. The construction vehicle standards in Phase One came into effect on 14 September 2017 with the commencement of early works, including ground investigation surveys, land preparation works, ecological surveys, etc.

4.2.3 As Phase 2a commences into early environmental works emission standards for construction vehicle emissions, NRMM and dust management will similarly be applied as in Phase One. Phase 2a Information Paper E14: Air Quality sets out these HS2 emission standards applicable from the start of works.

#### Vehicle and NRMM Emission Compliance

4.2.4 The HS2 Phase One route is divided into 3 areas to show compliance, Area North, Central and South, where:

- Area North begins south of Long Itchington Wood tunnel (south of Warwick) and proceeds to the Birmingham Interchange and Curzon Street Stations, to Handsacre where it connects with the West Coast Main Line at Lichfield.

- Area Central extends from the Colne valley viaduct and Chiltern Tunnels, through to the North Portal Chiltern tunnels to Brackley, to the Itchington Green Tunnel, south portal area.
- Area South covers the Central Activity Zone (CAZ) (including Euston) and the Greater London Area.

4.2.5 The Phase One Area targets and requirements are presented in Table 2. Opportunities for exemptions are made available to all contractors on the grounds of specialism, triviality or unforeseen circumstances. HS2 have committed to granting no more than 8% unique vehicle exemptions, across the Phase One route, on an annual basis.

Table 2: Construction Vehicle Emission Targets and Requirements

Vehicle Class & Minimum Vehicle Emission Standard	Area South	Rest of Route (Area Central and Area North)
Heavy Goods Vehicles (HGVs) <ul style="list-style-type: none"> <li>• Euro VI</li> </ul>	Target – 100% from start of works	Target – 100% from start of works
	Requirement – 100% from start of works	Requirement – as far as reasonably practicable, 100%
Light Duty Vehicles (LDVs) <ul style="list-style-type: none"> <li>• Euro 6 Diesel</li> <li>• Euro 4 Petrol</li> </ul>	Target – 100% from start of works	Target – 80% from start of works
	Requirement – 100% from 2020	Requirement – 100% from 2020
Exemptions	No more than 8% of unique vehicles on an annual basis	

4.2.6 Similar to HGV and LDVs, NRMM (of a net power between 37kW and 560kW) are categorised based on their emissions. HS2 committed to stricter requirements than the London Supplementary Planning Guidance (SPG) which includes requirements for NRMM used within Greater London and the Central Activity Zone to be of a certain standard, dependant on the year of use. The NRMM emission targets that HS2 has committed to are presented in Table 3.

Table 3: NRMM Emission Requirements

Area	London SPG Stage Requirements		HS2 Requirements	
	From 2015	From Sept 2020	From 2017	From 2020 (*)
Central Activity Zone (includes Euston)	Stage IIIB	Stage IV	Stage IV <sup>(1,2)</sup>	Stage V
Rest of Greater London	Stage IIIA	Stage IIIB	Stage IIIB <sup>(2)</sup>	Stage IV <sup>(1,2)</sup>
Rest of Country	Not Applicable	Not Applicable	Stage IIIB <sup>(2)</sup>	Stage IV <sup>(1,2)</sup>

**Notes:**

The above emission standard requirements should be read in conjunction with High Speed Two Information Paper, E31: Air Quality.

<sup>(1)</sup> Stage IIIB for  $37 \leq P < 56$  kW, as there is no corresponding Stage (IV) at EU Level

<sup>(2)</sup> Stage IIIA for constant speed engines of any power, as there is no corresponding Stage IIIB or IV at EU level.

(\*) Following an annual review of the NRMM requirements, as well as independent advice from the Energy Saving Trust, a Block Exemption was put in place for 2020 and 2021 extending the 2017 requirements.

4.2.7 The 2020 vehicle and NRMM emission compliance figures are presented in Table 4.

Table 4: Vehicle Emission Targets and Requirements

Area	Category	Requirement	Compliance Achieved
Area North	LDV	100%*	75.4%
	HGV	100%	98.0%
	NRMM	100%	99.1%
Area Central	LDV	100%*	71.2%
	HGV	100%	98.4%
	NRMM	100%	99.9%
Area South	LDV	100%*	95.0%
	HGV	100%	99.8%
	NRMM (CAZ)	100%	100%
	NRMM (Greater London)	100%	100%

*\* As a result of national Covid-19 lockdown measures and restrictions, staff used personal vehicles to move between sites and locations, following guidance to avoid the use of public transport. As lockdown restrictions have lifted, so too have LDV compliance rates.*

## Innovations

- 4.2.8 Through 2020, HS2 has continued to work with key partners within the industry in considering innovative means to reducing air quality emissions associated with our works. Many of these projects are still ongoing, as key milestones are met these will be publicly shared<sup>19</sup>.
- 4.2.9 Some of these projects include:
- Construction Equipment Association Emissions Compliance Verification System;
  - NRMM emission reduction project and NRMM retrofit solutions;
  - Clean Air Gas Engine (CAGE) trials;
  - Continued deployment of low / zero emitting plant; and
  - Hydrogen focused opportunities.
- 4.2.10 HS2 has also demonstrated innovation through the continued deployment and use of construction equipment with either zero (0) or significantly lower NOx emissions. Some aspects of construction have been undertaken using electric equipment and hybrid excavators, further reducing pollutant emissions from this site.
- 4.2.11 HS2 will continue to monitor air quality in line with the LAQM requirements as set out in the CoCP. In consideration of potential future local authority designated Clean Air Zones, HS2 has also been liaising with relevant local authorities and will consider these in future annual air quality reports. Furthermore, HS2 has published an Air Quality Action Plan to outline commitments made, and progress thereof in the management of the significant effects identified in the ES.

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<sup>19</sup> HS2 and Air Quality Webpage: <https://www.hs2.org.uk/in-your-area/managing-impacts-of-construction/hs2-and-air-quality/>



# Appendix A – Summary of receptors with significant effects predicted in the ES

## Phase One

The number of receptors with significant effects in Phase One is presented in Table 5. This has been calculated from the annual mean NO<sub>2</sub> modelling results presented in the ES, as amended. These calculations are a combination of results from the Supplementary Environmental Statement (SES) and Additional Provision (AP) 2, SES2 and AP3, SES3 and AP4. Air quality modelling was not undertaken for the SES4 and AP5 ES. The calculations use the latest reported modelling result for each receptor.

Table 5: Summary of number of receptors modelled in the ES with adverse and beneficial significant effects for Greater London area

Significant Effect	Air Quality Impact Descriptor	Number of Receptors
Significant adverse	Substantial adverse	227
Significant adverse	Moderate adverse	199
Not significant	Slight adverse	10
Not significant	Negligible	241
Not significant	Slight beneficial	10
Significant beneficial	Moderate beneficial	39
Significant beneficial	Substantial beneficial	31
<b>Total number of receptors</b>		<b>757</b>

## Phase 2a

Significant effects in Phase 2a were predicted at 9 residential receptors for NO<sub>2</sub> concentrations near the M6. Potential significant effects were predicted across the following local authority areas:

- Stafford seven (7) locations;
- Newcastle-under-Lyme one (1) location; and
- Cheshire East one (1) location.

NO<sub>2</sub> concentrations in these areas were predicted to exceed the air quality standard even without the Proposed Scheme.

## Appendix B – HS2 Air Quality monitoring survey locations

Table 6 and 7 gives details of the locations included in the HS2 NO<sub>2</sub> diffusion tube surveys during 2019 for Phase One and Phase 2a respectively. Appendix G presents maps of the locations, labelled with the site ID, colour coded based on the measured concentration.

Table 6 and 7 gives details of the locations included in the HS2 NO<sub>2</sub> diffusion tube surveys during 2019 for Phase One and Phase 2a respectively. Appendix G presents maps of the locations, labelled with the site ID, colour coded based on the measured concentration.

Table 6: Details of HS2 Phase One air quality NO<sub>2</sub> diffusion tube monitoring survey locations

Site ID	Local authority	Site location	Location type	X coordinate	Y coordinate	Height (m)	Site purpose
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	530436	182929	2.3	Predicted significant effect
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	530321	182268	2.5	Predicted significant effect
HS2-000020BM7	Camden Council	Chalton Street	Roadside	529894	182702	2.3	Predicted significant effect
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	529737	182641	2.3	Predicted significant effect
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	529785	182529	2.4	Predicted significant effect
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	529429	182375	2.5	Predicted significant effect
HS2-000020BMB	Camden Council	Whitfield Street	Background	529273	182114	2.5	Predicted significant effect
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	529232	182511	2.3	Predicted significant effect
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	528776	182170	2.3	Predicted significant effect
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	528901	182180	2.3	Predicted significant effect
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	529715	183123	2.5	Predicted significant effect
HS2-000020BMH	Camden Council	Nash Street	Background	528861	182717	2.5	Predicted significant effect
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	529080	182698	2.5	Predicted significant effect
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	529196	183546	2.5	Predicted significant effect
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	529093	183356	2.5	Predicted significant effect
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	529084	183722	2.5	Predicted significant effect
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	528850	183573	2.5	Predicted significant effect
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	528662	183604	2.5	Predicted significant effect
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	528548	183967	2.5	Predicted significant effect
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	528685	184188	2.5	Predicted significant effect
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	529079	184043	2.3	Predicted significant effect
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	527783	185407	2.5	Predicted significant effect
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	527538	184250	2.5	Predicted significant effect
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	526619	184081	2.3	Predicted significant effect
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	527206	182887	2.3	Predicted significant effect
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	526549	182226	2.3	Predicted significant effect
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	525102	186042	2.3	Predicted significant effect

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Site ID	Local authority	Site location	Location type	X coordinate	Y coordinate	Height (m)	Site purpose
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	523869	182465	2.3	Predicted significant effect
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	523998	180160	2.5	Predicted significant effect
HS2-000020BN2	Hammersmith & Fulham Council	Lamp post on Du Cane Road	Roadside	523092	181264	2.5	Predicted significant effect
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	522335	182955	2.5	Predicted significant effect
HS2-000020BN4	Hammersmith & Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	521625	180871	2.3	Predicted significant effect
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	521443	182477	2.3	Predicted significant effect
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	520959	181102	2.3	Predicted significant effect
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	527884	183980	2.5	Predicted significant effect
HS2-000020BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Roadside	528639	183518	2.5	Predicted significant effect
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	528528	183443	2.5	Predicted significant effect
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	528276	182185	2.5	Predicted significant effect
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	523110	184055	2.5	Predicted significant effect
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	528763	183720	2.5	Predicted significant effect
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	527359	182633	2.3	Predicted significant effect
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	526914	182077	2.3	Background not affected by scheme
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	530744	181308	2.5	Background not affected by scheme
HS2-000020BNQ	Camden Council	Camley Street	Background	529735	183737	2.3	Background not affected by scheme
HS2-000020BNR	Hammersmith & Fulham Council	Lamp posts in Shepherd's Bush Common	Background	523481	179871	2.5	Background not affected by scheme
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	522196	184448	2.5	Background not affected by scheme
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	509678	187214	2.5	Background not affected by scheme
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	505492	183926	2.5	Roadside not affected by scheme
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	509439	187117	2.3	Roadside not affected by scheme
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	507365	182687	2.5	Roadside not affected by scheme
HS2-000020BNX	Hammersmith & Fulham Council	Signpost on A402 Goldhawk Road	Roadside	522035	179199	2.5	Roadside not affected by scheme
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	524839	185136	2.5	Roadside not affected by scheme

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Site ID	Local authority	Site location	Location type	X coordinate	Y coordinate	Height (m)	Site purpose
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	528050	185508	2.5	Roadside not affected by scheme
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	529708	184871	2.3	Roadside not affected by scheme
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	528597	180942	2.3	Roadside not affected by scheme
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	531149	181616	2.5	Roadside not affected by scheme
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	528125	182016	2.5	Colocation kerbside
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	526633	184392	3.0	Colocation kerbside
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	529895	182657	2.5	Colocation roadside
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	520430	181950	2.0	Colocation roadside
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyratory roadside automatic monitoring station	Roadside	518537	182708	2.0	Colocation roadside
HS2-000020BP8	Hillingdon Council	Triplicate site at South Ruislip roadside automatic monitoring station	Roadside	510858	184916	2.5	Colocation roadside
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	530120	182034	2.5	Colocation background
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	524045	181752	2.5	Colocation background
HS2-000020BPB	Camden Council	Camden High Street	Roadside	528966	183735	2.3	Predicted significant effect
HS2-000020BPC	Camden Council	Castlehaven Road	Background	528788	184591	2.5	Predicted significant effect
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	528571	184683	2.5	Predicted significant effect
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	527710	184749	2.5	Predicted significant effect
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	527549	184640	2.5	Predicted significant effect
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	527019	182748	2.3	Predicted significant effect
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	526818	183164	2.3	Predicted significant effect
HS2-000020BPK	Hillingdon Council	Lamp post in crescent off Swakeleys Road	Roadside	506542	186037	2.2	Predicted significant effect
HS2-000020BPL	Hillingdon Council	Warren Road sign post on corner of Swakeleys Road and Warren Road	Roadside	506240	185660	2.3	Predicted significant effect
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	525222	183309	2.5	Background not affected by scheme

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Site ID	Local authority	Site location	Location type	X coordinate	Y coordinate	Height (m)	Site purpose
HS2-000020BPN	Hillingdon Council	Lamp post on B467	Roadside	506767	186224	2.3	Predicted significant effect
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	523792	181066	2.5	Predicted significant effect
HS2-000020BPP	Hammersmith & Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	522378	182877	2.5	Predicted significant effect
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	523763	181172	2.5	Predicted significant effect
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	523886	182358	2.5	Predicted significant effect
HS2-000020BPT	Hammersmith & Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	522478	182517	2.5	Predicted significant effect
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	529476	182267	2.5	Predicted significant effect
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	528939	183637	2.5	Predicted significant effect
HS2-000020BPX	Camden Council	Netley Street	Background	529177	182625	2.5	Predicted significant effect
HS2-000020BPY	Camden Council	Stanhope Street	Background	529060	182947	2.5	Predicted significant effect
HS2-000020BPZ	Camden Council	Albany Street	Roadside	528790	182923	2.5	Predicted significant effect
HS2-000020BQ0	Camden Council	Werrington Street	Background	529493	183113	2.3	Predicted significant effect
HS2-000020BQ1	Camden Council	Polygon Road	Background	529574	183045	2.5	Predicted significant effect
HS2-000020BQ2	Camden Council	Alexandra Place	Background	526320	183980	2.5	Predicted significant effect
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	529228	183172	2.5	Predicted significant effect
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	529290	182572	2.5	Predicted significant effect
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	527713	184392	2.7	Predicted significant effect
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	528836	183474	2.5	Predicted significant effect
HS2-000020BQ7	Camden Council	Arlington Road	Background	529009	183479	2.5	Predicted significant effect
HS2-000020BQ8	Camden Council	Clarkson Row	Background	529024	183213	2.5	Predicted significant effect
HS2-000020BQ9	Camden Council	Park Village East	Background	528923	183121	2.5	Predicted significant effect
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	529386	183132	2.5	Predicted significant effect
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	529147	182816	2.5	Predicted significant effect
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	529199	182704	2.5	Predicted significant effect
HS2-000020BQD	Camden Council	Drummond Crescent	Background	529648	182856	2.5	Predicted significant effect

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Site ID	Local authority	Site location	Location type	X coordinate	Y coordinate	Height (m)	Site purpose
HS2-000020BQE	Hammersmith & Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	521996	181118	2.5	Predicted significant effect
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	520856	181733	2.5	Predicted significant effect
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	521312	182033	2.5	Predicted significant effect
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	508451	186879	2.4	Predicted significant effect
HS2-000020BQJ	Camden Council	Grafton Way	Background	529380	182225	2.5	Predicted significant effect
HS2-000020BQL	Camden Council	Delancey Street	Roadside	528768	183581	2.4	Predicted significant effect
HS2-000020BQN	Hillingdon Council	Lamp post on Park Road	Roadside	506176	185444	2.4	Predicted significant effect
HS2-000020BQP	Hillingdon Council	Sign post on Long Lane	Roadside	507614	184663	2.1	Predicted significant effect
HS2-000020BQQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Kerbside	524036	182034	2.1	Predicted significant effect
HS2-000020BQR	Camden Council	Lamp post on Park Village East	Background	528682	183505	2.4	Predicted significant effect
HS2-000020BQS	Camden Council	Opposite Maria fidelis school on Phoenix Road	Background	529670	182982	2.3	Predicted significant effect
HS2-000020BQT	Camden Council	Drummond Street	Background	529385	182581	2.2	Predicted significant effect
HS2-000020BQU	Westminster City Council	Lamp post outside Edgware Road Station	Kerbside	527048	181731	2.2	Predicted significant effect
HS2-000020BQV	Kensington and Chelsea Council	Lamp post on St Ann's Street	Kerbside	523838	180606	2.4	Predicted significant effect
HS2-000020BQW	Hammersmith & Fulham Council	Lamp post on A402 Goldhawk Road <i>(replaced HS2-000020BNX)</i>	Kerbside	522037	179209	2.2	Predicted significant effect
HS2-000020BQX	Camden Council	Lamp Post on Brunswick Square <i>(replaced HS2-000020BM6)</i>	Roadside	530344	182236	2.5	Predicted significant effect

Table 7: Details of HS2 Phase 2a air quality NO<sub>2</sub> diffusion tube monitoring survey locations

Site ID	Local authority	Site location	Location type	X coordinate	Y coordinate	Height (m)	Site purpose
1	Staffordshire	South-west of Stafford (CA2) – Ashflats Lane	Roadside	392247	319432	2.0	Predicted significant effect
2	Staffordshire	South-west of Stafford (CA2) – Ash Rise	Suburban	392355	319784	2.0	Predicted significant effect
3	Staffordshire	South-west of Stafford (CA2) – Barn Bank Lane	Suburban	392217	319929	2.0	Predicted significant effect
4	Staffordshire	South-west of Stafford (CA2) – Southfields Close	Suburban	391894	320423	2.0	Predicted significant effect
5	Staffordshire	South-west of Stafford (CA2) – Devon Way	Suburban	391717	320592	2.0	Predicted significant effect
6	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road E	Roadside	391559	320699	2.1	Predicted significant effect
7	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road W	Kerbside	391539	320634	2.15	Predicted significant effect
8	Staffordshire	South-west of Stafford (CA2) – Crinan Grove	Suburban	391498	320799	2.0	Predicted significant effect
9	Newcastle under Lyme	Madeley Heath (CA4) – Newcastle Road	Roadside	378110	345523	2.15	Predicted significant effect
10	Cheshire East Council	Oakhanger (CA5) – Nursery Road	Rural	377035	355030	2.0	Predicted significant effect



# Appendix C – Annualisation and bias adjustment of NO<sub>2</sub> diffusion tubes

Table 8: Annualisation and bias adjustment factors applied to each monitoring site across Phase One

Site ID	Local authority	Site location	Location type	2020 annualisation factor <sup>20</sup>	2020 bias adjustment factor
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	Not annualised	0.85
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	Not annualised	0.85
HS2-000020BM7	Camden Council	Chalton Street	Roadside	0.8212	0.85
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	Not annualised	0.85
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	Not annualised	0.85
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	Not annualised	0.85
HS2-000020BMB	Camden Council	Whitfield Street	Background	1.0228	0.83
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	0.9363	0.85
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	0.9861	0.85
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	1.0130	0.85
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	0.9831	0.83
HS2-000020BMH	Camden Council	Nash Street	Background	0.9363	0.83
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	Not annualised	0.83
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	Not annualised	0.85
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	Not annualised	0.83
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	0.9333	0.85
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	Not annualised	0.85
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	Not annualised	0.85
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	0.9996	0.83
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	Not annualised	0.85
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	Not annualised	0.74
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	0.9831	0.85
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	Not annualised	0.85
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	0.8672	0.85
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	0.9363	0.85
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	0.9861	0.85
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	Not annualised	0.85
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	Not annualised	0.85
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	Not annualised	0.85
HS2-000020BN2	Hammersmith & Fulham Council	Lamp post on Du Cane Road	Roadside	Not annualised	0.85

<sup>20</sup> Sites have not been annualised where there is greater than 75% or less than 25% data capture

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Site ID	Local authority	Site location	Location type	2020 annualisation factor <sup>20</sup>	2020 bias adjustment factor
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	Not annualised	0.85
HS2-000020BN4	Hammersmith & Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	Not annualised	0.85
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	1.0130	0.85
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	Not annualised	0.85
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	0.9253	0.85
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	Not annualised	0.83
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	0.9363	0.74
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	Not annualised	0.85
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	Not annualised	0.74
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	0.9324	0.85
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	0.9996	0.83
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	0.9437	0.83
HS2-000020BNQ	Camden Council	Camley Street	Background	0.9912	0.83
HS2-000020BNR	Hammersmith & Fulham Council	Lamp posts in Shepherd's Bush Common	Background	1.0202	0.83
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	0.9861	0.83
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	Not annualised	0.83
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	Not annualised	0.85
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	Not annualised	0.85
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	Not annualised	0.85
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	0.9324	0.85
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	Not annualised	0.85
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	0.9660	0.85
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	0.9996	0.85
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	Not annualised	0.85
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	Not annualised	0.74
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	0.9861	0.74
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	Not annualised	0.85
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	Not annualised	0.85
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotory roadside automatic monitoring station	Roadside	Not annualised	0.85
HS2-000020BP8	Hillingdon Council	Triplicate site at South Ruislip roadside automatic monitoring station	Roadside	Not annualised	0.85
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	Not annualised	0.83

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Site ID	Local authority	Site location	Location type	2020 annualisation factor <sup>20</sup>	2020 bias adjustment factor
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	Not annualised	0.83
HS2-000020BPB	Camden Council	Camden High Street	Roadside	Not annualised	0.85
HS2-000020BPC	Camden Council	Castlehaven Road	Background	Not annualised	0.83
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	Not annualised	0.85
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	Not annualised	0.85
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	Not annualised	0.83
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	Not annualised	0.85
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	Not annualised	0.85
HS2-000020BPK	Hillingdon Council	Lamp post in crescent off Swakeleys Road	Roadside	Not annualised	0.85
HS2-000020BPL	Hillingdon Council	Warren Road sign post on corner of Swakeleys Road and Warren Road	Roadside	Not annualised	0.85
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	0.9324	0.83
HS2-000020BPN	Hillingdon Council	Lamp post on B467	Roadside	0.9437	0.85
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	1.0263	0.85
HS2-000020BPP	Hammersmith & Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	Not annualised	0.85
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	Not annualised	0.85
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	0.9840	0.85
HS2-000020BPT	Hammersmith & Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	1.0148	0.85
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	Not annualised	0.85
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	Not annualised	0.85
HS2-000020BPX	Camden Council	Netley Street	Background	Not annualised	0.83
HS2-000020BPY	Camden Council	Stanhope Street	Background	Not annualised	0.83
HS2-000020BPZ	Camden Council	Albany Street	Roadside	0.9437	0.85
HS2-000020BQ0	Camden Council	Werrington Street	Background	Not annualised	0.83
HS2-000020BQ1	Camden Council	Polygon Road	Background	Not annualised	0.83
HS2-000020BQ2	Camden Council	Alexandra Place	Background	Not annualised	0.83
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	Not annualised	0.74
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	Not annualised	0.83
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	1.0130	0.85
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	Not annualised	0.83
HS2-000020BQ7	Camden Council	Arlington Road	Background	Not annualised	0.83
HS2-000020BQ8	Camden Council	Clarkson Row	Background	Not annualised	0.83
HS2-000020BQ9	Camden Council	Park Village East	Background	Not annualised	0.83
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	Not annualised	0.74
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	Not annualised	0.83
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	Not annualised	0.74

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Site ID	Local authority	Site location	Location type	2020 annualisation factor <sup>20</sup>	2020 bias adjustment factor
HS2-000020BQD	Camden Council	Drummond Crescent	Background	1.0130	0.83
HS2-000020BQE	Hammersmith & Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	Not annualised	0.83
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	Not annualised	0.85
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	0.9996	0.85
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	Not annualised	0.85
HS2-000020BQJ	Camden Council	Grafton Way	Background	Not annualised	0.85
HS2-000020BQL	Camden Council	Delancey Street	Roadside	0.9861	0.85
HS2-000020BQN	Hillingdon Council	Lamp post on Park Road	Roadside	1.0228	0.85
HS2-000020BQP	Hillingdon Council	Sign post on Long Lane	Roadside	Not annualised	0.85
HS2-000020BQQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Kerbside	Not annualised	0.74
HS2-000020BQR	Camden Council	Lamp post on Park Village East	Background	Not annualised	0.83
HS2-000020BQS	Camden Council	Opposite Maria fidelis school on Phoenix Road	Background	Not annualised	0.83
HS2-000020BQT	Camden Council	Drummond Street	Background	Not annualised	0.83
HS2-000020BQU	Westminster City Council	Lamp post outside Edgware Road Station	Kerbside	Not annualised	0.74
HS2-000020BQV	Kensington and Chelsea Council	Lamp post on St Ann's Street	Kerbside	0.9437	0.74
HS2-000020BQW	Hammersmith & Fulham Council	Lamp post on A402 Goldhawk Road (replaced HS2-000020BNX)	Kerbside	1.0130	0.74
HS2-000020BQX	Camden Council	Lamp Post on Brunswick Square (replaced HS2-000020BM6)	Roadside	1.0347	0.85

Table 9: Annualisation and bias adjustment factors applied to each monitoring site across Phase 2a

Site ID	Local authority	Site location	Site location type	2020 annualisation factor <sup>21</sup>	2020 bias adjustment factor
1	Staffordshire	South-west of Stafford (CA2) – Ashflats Lane	Roadside	0.888	0.91
2	Staffordshire	South-west of Stafford (CA2) – Ash Rise	Suburban	0.888	0.91
3	Staffordshire	South-west of Stafford (CA2) – Barn Bank Lane	Suburban	0.888	0.91
4	Staffordshire	South-west of Stafford (CA2) – Southfields Close	Suburban	0.888	0.91
5	Staffordshire	South-west of Stafford (CA2) – Devon Way	Suburban	0.888	0.91
6	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road E	Roadside	0.888	0.91
7	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road W	Kerbside	0.898	0.91
8	Staffordshire	South-west of Stafford (CA2) – Crinan Grove	Suburban	0.888	0.91
9	Newcastle under Lyme	Madeley Heath (CA4) – Newcastle Road	Roadside	0.888	0.91
10	Cheshire East Council	Oakhanger (CA5) – Nursery Road	Rural	0.888	0.91

<sup>21</sup> Sites have not been annualised where there is greater than 75% or less than 25% data capture

# Appendix D – Air Quality Monitoring Results

## HS2 NO<sub>2</sub> diffusion tube results

Table 10: Annual mean Phase One NO<sub>2</sub> monitoring results for 2020

Site ID	Local authority	Site location	Location type	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	36
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	<b>48</b>
HS2-000020BM7	Camden Council	Chalton Street	Roadside	<b>42</b>
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	<b>42</b>
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	<b>40</b>
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	39
HS2-000020BMB	Camden Council	Whitfield Street	Background	29
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	<b>48</b>
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	39
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	<b>52</b>
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	24
HS2-000020BMH	Camden Council	Nash Street	Background	27
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	28
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	<b>41</b>
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	27
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	<b>42</b>
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	31
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	36
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	26
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	39
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	33
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	32
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	28
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road32	Roadside	36
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	32
HS2-000020BMY	Westminster City Council	Lamp post54 between Blomfield Road and Edgware36 Road	Roadside	36
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	<b>54</b>
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	36
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	36

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Site ID	Local authority	Site location	Location type	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )
HS2-000020BN2	Hammersmith & Fulham Council	Lamp post on Du Cane Road	Roadside	36
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	<b>42</b>
HS2-000020BN4	Hammersmith & Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	37
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	37
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	<b>41</b>
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	25
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	18
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	23
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	32
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	26
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	36
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	28
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	25
HS2-000020BNQ	Camden Council	Camley Street	Background	27
HS2-000020BNR	Hammersmith & Fulham Council	Lamp posts in Shepherd's Bush Common	Background	30
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	22
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	20
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	34
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	31
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	32
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	31
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	27
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	<b>41</b>
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	35
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	31
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	<b>42</b>
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	34
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	<b>47</b>
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	<b>41</b>
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotary roadside automatic monitoring station	Roadside	<b>51</b>
HS2-000020BP8	Hillingdon Council	Triplicate site at South Ruislip roadside automatic monitoring station	Roadside	28

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Site ID	Local authority	Site location	Location type	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	28
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	23
HS2-000020BPB	Camden Council	Camden High Street	Roadside	<b>50</b>
HS2-000020BPC	Camden Council	Castlehaven Road	Background	26
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	24
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	33
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	28
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	28
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	30
HS2-000020BPK	Hillingdon Council	Lamp post in crescent off Swakeleys Road	Roadside	28
HS2-000020BPL	Hillingdon Council	Warren Road sign post on corner of Swakeleys Road and Warren Road	Roadside	31
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	23
HS2-000020BPN	Hillingdon Council	Lamp post on B467	Roadside	25
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	28
HS2-000020BPP	Hammersmith & Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	38
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	31
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbrooke Grove, south of A404 Harrow Road	Roadside	37
HS2-000020BPT	Hammersmith & Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	37
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	35
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	32
HS2-000020BPX	Camden Council	Netley Street	Background	26
HS2-000020BPY	Camden Council	Stanhope Street	Background	24
HS2-000020BPZ	Camden Council	Albany Street	Roadside	27
HS2-000020BQ0	Camden Council	Werrington Street	Background	26
HS2-000020BQ1	Camden Council	Polygon Road	Background	27
HS2-000020BQ2	Camden Council	Alexandra Place	Background	23
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	31
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	28
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	29
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	23
HS2-000020BQ7	Camden Council	Arlington Road	Background	26
HS2-000020BQ8	Camden Council	Clarkson Row	Background	25
HS2-000020BQ9	Camden Council	Park Village East	Background	23
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	34

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Site ID	Local authority	Site location	Location type	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	24
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	28
HS2-000020BQD	Camden Council	Drummond Crescent	Background	31
HS2-000020BQE	Hammersmith & Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	26
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	<b>41</b>
HS2-000020BQG	Ealing Council	Lamp post outside No 1, Wells House Road on Old Oak Common Lane	Roadside	39
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	30
HS2-000020BQJ	Camden Council	Grafton Way	Background	38
HS2-000020BQL	Camden Council	Delancey Street	Roadside	34
HS2-000020BQN	Hillingdon Council	Lamp post on Park Road	Roadside	33
HS2-000020BQP	Hillingdon Council	Sign post on Long Lane	Roadside	31
HS2-000020BQQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Kerbside	34
HS2-000020BQR	Camden Council	Lamp post on Park Village East	Background	25
HS2-000020BQS	Camden Council	Opposite Maria fidelis school on Phoenix Road	Background	26
HS2-000020BQT	Camden Council	Drummond Street	Background	29
HS2-000020BQU	Westminster City Council	Lamp post outside Edgware Road Station	Kerbside	<b>40</b>
HS2-000020BQV	Kensington and Chelsea Council	Lamp post on St Ann's Street	Kerbside	27
HS2-000020BQW	Hammersmith & Fulham Council	Lamp post on A402 Goldhawk Road <i>(replaced HS2-000020BNX)</i>	Kerbside	26
HS2-000020BQX	Camden Council	Lamp Post on Brunswick Square <i>(replaced HS2-000020BM6)</i>	Roadside	29

### Notes:

Exceedances of the NO<sub>2</sub> annual mean air quality standard of 40 µg/m<sup>3</sup> are shown in bold.

Table 11: Annual mean Phase 2a NO<sub>2</sub> monitoring results for 2020

Site ID	Local authority	Site location	Location type	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )
1	Staffordshire	South-west of Stafford (CA2) – Ashflats Lane	Roadside	8.8
2	Staffordshire	South-west of Stafford (CA2) – Ash Rise	Suburban	13.1
3	Staffordshire	South-west of Stafford (CA2) – Barn Bank Lane	Suburban	19.7
4	Staffordshire	South-west of Stafford (CA2) – Southfields Close	Suburban	21.4
5	Staffordshire	South-west of Stafford (CA2) – Devon Way	Suburban	21.1
6	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road E	Roadside	16.4
7	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road W	Kerbside	14.7
8	Staffordshire	South-west of Stafford (CA2) – Crinan Grove	Suburban	17.2
9	Newcastle under Lyme	Madeley Heath (CA4) – Newcastle Road	Roadside	20.8
10	Cheshire East Council	Oakhanger (CA5) – Nursery Road	Rural	11.9



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Table 12: Full monthly raw Phase One NO<sub>2</sub> monitoring results for 2020 (prior to annualisation and bias adjustment)

Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )												No. of months of data	
				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20		Mean
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	56	51	No Data			34	27	38	39	37	54	47	43	9
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	55	57	Location moved – replaced with HS2-000020BQX										56	2
HS2-000020BM7	Camden Council	Chalton Street	Roadside	66	65	No Data			Tube missing		36	Tube missing	67	49	55	56	6
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	57	57	No Data			40	32	42	51	51	60	55	49	9
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	56	58	No Data			38	25	43	45	44	58	50	46	9
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	59	54	No Data			33	30	39	51	42	60	47	46	9
HS2-000020BMB	Camden Council	Whitfield Street	Background	45	43	No Data			26	19	29	32	33	Tube missing	42	34	8
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	58	53	No Data			Tube missing	48	69	69	61	75	50	60	8
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	60	Tube missing	No Data			40	30	47	48	44	55	46	46	8
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	Tube missing	69	No Data			53	37	60	59	60	73	66	60	8
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	38	Tube missing	No Data			24	14	23	27	Tube missing	42	35	29	7
HS2-000020BMH	Camden Council	Nash Street	Background	44	37	No Data			Tube missing	21	27	32	32	46	39	35	8
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	39	33	No Data			38	36	43	49	46	60	52	44	9
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	56	49	No Data			38	36	43	49	46	60	52	48	9
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	44	38	No Data			23	19	28	30	33	42	37	33	9
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	62	58	No Data			40	39	Tube missing		52	63	51	52	7
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	45	41	No Data			28	26	34	38	31	45	41	36	9
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	51	43	No Data			32	25	40	46	40	55	43	42	9

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Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )												No. of months of data	
				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20		Mean
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	42	36	No Data			24	21	30	32	26	44	Tube missing	32	8
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	52	50	No Data			39	29	47	45	43	54	48	45	9
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	51	43	No Data			34	28	42	47	43	58	51	44	9
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	45	Tube missing	No Data			29	24	38	42	No Data	46	43	38	7
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	44	38	No Data			22	18	27	38	30	45	35	33	9
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	Tube missing		No Data			Tube missing			47	43	54	52	49	4
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	55	43	No Data			Tube missing	24	31	36	38	46	43	39	8
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	57	Tube missing	No Data			32	28	39	44	42	49	48	42	8
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	82	61	No Data			56	47	57	63	55	80	65	63	9
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	52	42	No Data			42	22	47	44	42	Tube missing		42	7
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	57	44	No Data			30	22	32	44	45	57	49	42	9
HS2-000020BN2	Hammersmith & Fulham Council	Lamp post on Du Cane Road	Roadside	61	50	No Data			37	26	41	44	45	34	44	42	9
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	62	48	No Data			42	28	44	50	51	58	54	50	9
HS2-000020BN4	Hammersmith & Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	48	39	No Data			36	30	43	46	41	54	50	43	9
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	Tube missing	46	No Data			39	25	40	47	46	60	44	43	8
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	64	55	No Data			37	29	37	50	51	61	52	48	9
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	42	30	No Data			Tube missing	20	25	27	No Data	44	32	31	7
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	33	25	No Data			19	13	21	25	8	34	31	23	9
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	45	39	No Data			Tube missing	18	22	28	31	40	40	33	8

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Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )												No. of months of data	
				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20		Mean
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	50	40	No Data			29	25	29	33	35	53	41	37	9
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	46	35	No Data			29	24	29	37	34	48	38	36	9
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	58	49	No Data			35	Tube missing	35	39	41	53	50	45	8
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	47	37	No Data			25	19	27	33	33	44	Tube missing	33	8
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	41	41	No Data			20	18	Tube missing	26	28	42	39	32	8
HS2-000020BNQ	Camden Council	Camley Street	Background	Tube missing	31	No Data			27	Tube missing		33	Tube missing		41	33	5
HS2-000020BNR	Hammersmith & Fulham Council	Lamp posts in Shepherd's Bush Common	Background	45	No Data				24	22	28	32	33	62	Tube missing	35	7
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	34	No Data				20	15	20	24	25	42	34	27	8
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	35	26	No Data			19	14	18	22	24	34	28	24	9
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	49	46	No Data			33	31	33	37	37	51	39	40	9
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	45	33	No Data			32	26	30	32	31	49	44	36	9
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	43	32	No Data			35	22	36	36	35	53	45	37	9
HS2-000020BNX	Hammersmith & Fulham Council	Signpost on A402 Goldhawk Road	Roadside	Location moved – replaced with HS2-000020BQW													
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	45	41	No Data			29	Tube missing	29	40	35	49	42	39	8
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	40	33	No Data			25	20	25	31	32	44	36	32	9
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	58	51	No Data			47	36	49	Tube missing	46	61	47	49	8
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	56	48	No Data			28	22	37	43	42	50	Tube missing	41	8
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	48	45	No Data			27	22	30	31	31	46	42	36	9
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	76	74	No Data			43	36	46	49	61	68	61	57	9

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				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20		Mean
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	54	Tube missing		No Data		41	35	50	51	45	45	48	46	8
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	69	67		No Data		54	35	49	56	48	59	58	55	9
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	56	46		No Data		40	35	42	50	50	61	48	48	9
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrary roadside automatic monitoring station	Roadside	77	61		No Data		56	50	54	55	58	75	53	60	9
HS2-000020BP8	Hillingdon Council	Triplicate site at South Ruislip roadside automatic monitoring station	Roadside	39	32		No Data		29	22	28	31	28	44	37	32	9
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	44	43		No Data		23	19	25	29	28	41	41	33	9
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	37	28		No Data		17	18	21	24	27	40	32	27	9
HS2-000020BPB	Camden Council	Camden High Street	Roadside	65	54		No Data		50	52	57	69	62	68	53	59	9
HS2-000020BPC	Camden Council	Castlehaven Road	Background	43	36		No Data		24	15	27	28	26	47	37	31	9
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	39	27		No Data		20	13	22	25	28	43	41	29	9
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	52	41		No Data		33	24	34	36	37	52	39	39	9
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	47	33		No Data		27	18	30	33	30	50	40	34	9
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	45	33		No Data		30	16	30	31	31	51	32	33	9
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	48	41		No Data		26	20	28	34	36	47	39	35	9
HS2-000020BPK	Hillingdon Council	Lamp post in crescent off Swakeleys Road	Roadside	40	34		No Data		27	28	29	35	31	42	28	33	9

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Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )													No. of months of data
				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20	Mean	
HS2-000020BPL	Hillingdon Council	Warren Road sign post on corner of Swakeleys Road and Warren Road	Roadside	51	40	No Data			28	28	30	33	35	49	38	37	9
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	39	32	No Data			21	Tube missing	21	25	28	42	31	30	8
HS2-000020BPN	Hillingdon Council	Lamp post on B467	Roadside	41	30	No Data			24	21	Tube missing	30	29	38	34	31	8
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	45	35	No Data			26	19	29	34	Tube missing		39	32	7
HS2-000020BPP	Hammersmith & Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	62	39	No Data			39	27	39	44	42	61	49	45	9
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	46	36	No Data			31	22	33	38	36	45	41	36	9
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	Tube missing		No Data			40	Tube missing	39	39	43	51	51	44	6
HS2-000020BPT	Hammersmith & Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	Tube missing	40	No Data			40	25	41	42	No Data	63	51	43	7
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	56	50	No Data			31	27	36	38	36	55	45	42	9
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	50	37	No Data			31	24	35	42	36	43	43	38	9
HS2-000020BPX	Camden Council	Netley Street	Background	34	28	No Data			29	17	28	34	30	49	28	31	9
HS2-000020BPY	Camden Council	Stanhope Street	Background	40	29	No Data			22	15	25	27	28	43	36	29	9
HS2-000020BPZ	Camden Council	Albany Street	Roadside	44	36	No Data			24	19	No Data	32	31	44	38	34	8
HS2-000020BQ0	Camden Council	Werrington Street	Background	42	36	No Data			22	16	23	27	28	45	37	31	9
HS2-000020BQ1	Camden Council	Polygon Road	Background	44	35	No Data			23	16	25	29	32	48	37	32	9
HS2-000020BQ2	Camden Council	Alexandra Place	Background	39	31	No Data			21	14	23	28	27	41	30	28	9
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	50	38	No Data			35	28	36	45	39	56	50	42	9
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	44	36	No Data			25	20	28	31	31	48	45	34	9
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	Tube missing	40	No Data			25	19	31	32	32	48	38	33	8
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	39	30	No Data			20	16	22	26	27	40	33	28	9

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Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )												No. of months of data	
				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20		Mean
HS2-000020BQ7	Camden Council	Arlington Road	Background	40	33	No Data			24	17	25	29	31	42	35	31	9
HS2-000020BQ8	Camden Council	Clarkson Row	Background	39	31	No Data			20	16	22	27	31	47	37	30	9
HS2-000020BQ9	Camden Council	Park Village East	Background	37	29	No Data			21	16	22	26	27	38	35	28	9
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	60	48	No Data			35	29	38	47	42	60	48	45	9
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	41	30	No Data			23	16	25	28	28	39	31	29	9
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	47	37	No Data			32	21	33	40	32	53	46	38	9
HS2-000020BQD	Camden Council	Drummond Crescent	Background	Tube missing	42	No Data			27	21	29	38	37	54	44	37	8
HS2-000020BQE	Hammersmith & Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	39	34	No Data			23	19	25	30	30	42	34	31	9
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	61	51	No Data			42	28	43	45	41	65	53	48	9
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Roadside	68	55	No Data			38	27	38	44	51	59	Tube missing	47	8
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	44	37	No Data			27	24	29	39	30	44	41	35	9
HS2-000020BQJ	Camden Council	Grafton Way	Background	55	54	No Data			36	33	43	47	40	56	49	46	9
HS2-000020BQL	Camden Council	Delancey Street	Roadside	44	No Data				33	26	36	47	38	51	46	40	8
HS2-000020BQN	Hillingdon Council	Lamp post on Park Road	Roadside	47	34	No Data			34	26	35	39	36	Tube missing	47	37	8
HS2-000020BQP	Hillingdon Council	Sign post on Long Lane	Roadside	45	33	No Data			30	24	34	38	32	48	41	36	9
HS2-000020BQQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Kerbside	57	53	No Data			41	29	49	51	43	49	42	46	9
HS2-000020BQR	Camden Council	Lamp post on Park Village East	Background	37	33	No Data			21	19	26	31	26	39	36	30	9
HS2-000020BQS	Camden Council	Opposite Maria fidelis school on Phoenix Road	Background	40	36	No Data			21	18	24	32	29	47	37	32	9
HS2-000020BQT	Camden Council	Drummond Street	Background	47	35	No Data			25	19	28	30	33	49	43	34	9
HS2-000020BQU	Westminster City Council	Lamp post outside Edgware Road Station	Kerbside	65	51	No Data			44	35	54	63	50	66	57	54	9
HS2-000020BQV	Kensington and Chelsea Council	Lamp post on St Ann's Street	Kerbside	49	40	No Data			27	20	Tube missing	38	40	53	43	39	8

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Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )												No. of months of data	
				Jan20	Feb20	Mar20	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20		Mean
HS2-000020BQW	Hammersmith & Fulham Council	Lamp post on A402 Goldhawk Road <i>(replaced HS2-000020BNX)</i>	Kerbside	No Data	36	No Data				27	21	34	36	38	47	39	
HS2-000020BQX	Camden Council	Lamp post on Brunswick Square <i>(replaced HS2-000020BM6)</i>	Roadside	Monitoring did not commence until March 2020					28	22	27	32	30	49	42	33	7

### Notes:

- Due to the Covid-19 pandemic and government lockdown it was not possible to conduct diffusion tube air quality monitoring during March to May 2020.
- Table contains raw data as presented in laboratory reports. Mean concentrations have not been annualised or bias adjusted and are not directly comparable to the NO<sub>2</sub> annual mean air quality standard of 40µg/m<sup>3</sup>.

Table 13: Full monthly raw Phase 2a NO<sub>2</sub> monitoring results for 2020 (prior to annualisation and bias adjustment)

Site ID	Local authority	Site location	Location type	NO <sub>2</sub> concentration (µg/m <sup>3</sup> )												No. of months of data
				Jan20	Feb20	Mar20*	Apr20	May20	Jun20	Jul20	Aug20	Sep20	Oct20	Nov20	Dec20	
1	Staffordshire	South-west of Stafford (CA2) – Ashflats Lane	Roadside	No Data	6.2	8.5*	No Data			9.7	8.3	10.1	14.8	16.4	10.9	6
2	Staffordshire	South-west of Stafford (CA2) – Ash Rise	Suburban	No Data	14.9	9.6*	No Data			12.9	15.4	14.9	18.8	20.5	16.2	6
3	Staffordshire	South-west of Stafford (CA2) – Barn Bank Lane	Suburban	No Data	28.4	15.5*	No Data			18.7	22.1	23.3	27.3	26.3	24.4	6
4	Staffordshire	South-west of Stafford (CA2) – Southfields Close	Suburban	No Data	29.1	15.1*	No Data			20.5	24.4	25.7	30.0	29.0	26.5	6
5	Staffordshire	South-west of Stafford (CA2) – Devon Way	Suburban	No Data	30.4	13.9*	No Data			19.5	22.4	25.1	30.4	29.2	26.2	6
6	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road E	Roadside	No Data	18.3	12.8*	No Data			15.9	19.4	20.7	22.2	24.8	20.2	6
7	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road W	Kerbside	No Data	13.2	Tube missing	No Data			17.5	17.3	Tube missing	20.1	21.7	18.0	4
8	Staffordshire	South-west of Stafford (CA2) – Crinan Grove	Suburban	No Data	23.3	10.2*	No Data			18.0	19.0	21.2	23.4	22.9	21.3	6
9	Newcastle under Lyme	Madeley Heath (CA4) – Newcastle Road	Roadside	No Data	33.5	15.9*	No Data			18.4	22.0	25.4	27.9	27.4	25.8	6
10	Cheshire East Council	Oakhanger (CA5) – Nursery Road	Rural	No Data	9.2	10.5*	No Data			16.1	12.4	13.4	17.5	19.9	14.75	6

**Notes:**

- Due to the Covid-19 pandemic and government lockdown it was not possible to conduct diffusion tube air quality monitoring during March to July 2020.
- Table contains raw data as presented in laboratory reports. Mean concentrations have not been annualised or bias adjusted and are not directly comparable to the NO<sub>2</sub> annual mean air quality standard of 40µg/m<sup>3</sup>.
- \*Data for March 2020 is presented for information only and has not been used in the analysis due to the extended period of exposure as a result of the Covid-19 pandemic lockdown restrictions on travel.



## Appendix E – Comparison of Phase One 2020 annual mean NO<sub>2</sub> diffusion tube results and the predicted NO<sub>2</sub> annual mean concentrations from the ES

Table 14 presents a comparison of the Phase One 2020 annual mean NO<sub>2</sub> diffusion tube results and the predicted 2012 and 2017 NO<sub>2</sub> annual mean concentrations from the ES for the scenario without the Proposed Scheme in place.

Table 14: Comparison of the Phase One 2020 annual mean NO<sub>2</sub> diffusion tube results and the predicted 2012 and 2017 NO<sub>2</sub> annual mean concentrations from the ES

Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Predicted significant effect	36.3	1-204	86.4	75.6	76.1	5	-39.3	-52%	-39.8	-52%
HS2-000020BM6	Camden Council	Brunswick Square	Predicted significant effect	47.7	1-7	61.1	52.5	52.4	67	-4.8	-9%	-4.7	-9%
HS2-000020BM7	Camden Council	Chalton Street	Predicted significant effect	42.3	1-1	104.8	90.1	91.9	14	-47.8	-53%	-49.6	-54%
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Predicted significant effect	42.1	1-178	91.7	81	82.5	29	-38.9	-48%	-40.4	-49%
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Predicted significant effect	39.5	1-47	93.6	82.3	83.3	16	-42.8	-52%	-43.8	-53%
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Predicted significant effect	39.3	1-170	99.3	80	82.1	0	-40.7	-51%	-42.8	-52%
HS2-000020BMB	Camden Council	Whitfield Street	Predicted significant effect	28.5	1-287	63.6	53.4	53.8	11	-24.9	-47%	-25.3	-47%
HS2-000020BMC	Camden Council	Hampstead Road	Predicted significant effect	48.2	1-165	83.1	66.6	67.5	9	-18.4	-28%	-19.3	-29%
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Predicted significant effect	38.6	1-42	89.6	75.7	76.4	49	-37.1	-49%	-37.8	-49%

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Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Predicted significant effect	51.5	1-279	86.1	72.8	73.4	17	-21.3	-29%	-21.9	-30%
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Predicted significant effect	23.7	1-79	50.4	43.4	43.7	0	-19.7	-45%	-20.0	-46%
HS2-000020BMH	Camden Council	Nash Street	Predicted significant effect	27.0	1-261	54.5	46.4	46.8	7	-19.4	-42%	-19.8	-42%
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Predicted significant effect	27.6	1-257	58.6	50.1	51.0	24	-22.5	-45%	-23.4	-46%
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Predicted significant effect	40.6	1-298	61.4	53.5	53.5	9	-12.9	-24%	-12.9	-24%
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Predicted significant effect	27.1	1-9	52	45.8	44.3	2	-18.7	-41%	-17.2	-39%
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Predicted significant effect	41.5	2-72	69.4	57.2	57.0	6	-15.7	-27%	-15.5	-27%
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Predicted significant effect	31.1	1-246	55.8	46.7	48.7	4	-15.6	-33%	-17.6	-36%
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Predicted significant effect	35.5	2-103	70.5	58.4	56.9	22	-22.9	-39%	-21.4	-38%
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Predicted significant effect	26.4	2-98	45.5	39.1	39.3	7	-12.7	-32%	-12.9	-33%
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Predicted significant effect	38.5	2-8	64.3	53.2	53.7	5	-14.7	-28%	-15.2	-28%
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Predicted significant effect	32.8	2-38	79.3	63.4	62.3	21	-30.6	-48%	-29.5	-47%
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Predicted significant effect	31.6	3-153	52.4	46.3	46.3	14	-14.7	-32%	-14.7	-32%
HS2-000020BMV	Camden Council	Primrose Hill Road	Predicted significant effect	28.1	3-213	55.2	46.7	45.1	32	-18.6	-40%	-17.0	-38%
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Predicted significant effect	36.2	3-60	64.9	53.6	53.8	8	-17.4	-32%	-17.6	-33%

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Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Predicted significant effect	31.5	1-141	65.1	55.7	56.1	24	-24.2	-43%	-24.6	-44%
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Predicted significant effect	35.6	4-65	64.2	54.1	53.9	13	-18.5	-34%	-18.3	-34%
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Predicted significant effect	53.6	3-96	70.4	56.4	56.4	8	-2.8	-5%	-2.8	-5%
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Predicted significant effect	36.2	4-225	77.1	66.2	66.3	14	-30.0	-45%	-30.1	-45%
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Predicted significant effect	36.0	4-193	62.3	53.2	53.3	4	-17.2	-32%	-17.3	-32%
HS2-000020BN2	Hammersmith & Fulham Council	Lamp post on Du Cane Road	Predicted significant effect	36.2	4-204	72.1	61.1	61.1	12	-24.9	-41%	-24.9	-41%
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Predicted significant effect	42.3	4-209	68.7	58.5	58.6	47	-16.2	-28%	-16.3	-28%
HS2-000020BN4	Hammersmith & Fulham Council	End of cycle lane sign on Old Oak Road	Predicted significant effect	36.6	4-155	88.7	76	76.1	18	-39.4	-52%	-39.5	-52%
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Predicted significant effect	37.4	4-12	64.6	52.6	56.0	3	-15.2	-29%	-18.6	-33%
HS2-000020BN7	Ealing Council	The Approach street sign	Predicted significant effect	41.3	4-152	83.3	69.6	69.6	20	-28.3	-41%	-28.3	-41%
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Predicted significant effect	24.8	3-193	47.4	39.4	38.2	2	-14.6	-37%	-13.4	-35%
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Predicted significant effect	18.4	1-70	49.4	42.7	43.1	22	-24.3	-57%	-24.7	-57%
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Predicted significant effect	22.9	1-281	61.1	52	52.4	15	-29.1	-56%	-29.5	-56%
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Predicted significant effect	31.7	4-120	53.7	46	46.1	14	-14.3	-31%	-14.4	-31%
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Predicted significant effect	26.4	2-85	61.6	51.3	51.0	18	-24.9	-49%	-24.6	-48%
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Predicted significant effect	35.7	1-242	69.7	57.4	58.2	10	-21.7	-38%	-22.5	-39%

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Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background not affected by scheme	27.5						No assessed receptor location nearby			
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background not affected by scheme	25.0						No assessed receptor location nearby			
HS2-000020BNQ	Camden Council	Camley Street	Background not affected by scheme	27.1						No assessed receptor location nearby			
HS2-000020BNR	Hammersmith & Fulham Council	Lamp posts in Shepherd's Bush Common	Background not affected by scheme	29.8						No assessed receptor location nearby			
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background not affected by scheme	21.9						No assessed receptor location nearby			
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background not affected by scheme	20.3						No assessed receptor location nearby			
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside not affected by scheme	33.7						No assessed receptor location nearby			
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside not affected by scheme	30.5						No assessed receptor location nearby			
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside not affected by scheme	31.9						No assessed receptor location nearby			
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside not affected by scheme	30.8						No assessed receptor location nearby			
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside not affected by scheme	27.1						No assessed receptor location nearby			
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside not affected by scheme	40.6						No assessed receptor location nearby			
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside not affected by scheme	34.7						No assessed receptor location nearby			

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HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside not affected by scheme	30.5	No assessed receptor location nearby								
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Colocation kerbside	42.4	1-293	92	77.3	77.7	33	-34.9	-45%	-35.3	-45%
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Colocation kerbside	33.8	3-64	76.8	60.2	60.0	9	-26.4	-44%	-26.2	-44%
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Colocation roadside	46.9	1-1	104.8	90.1	91.9	32	-43.2	-48%	-45.0	-49%
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Colocation roadside	40.5	5-35	74.3	63.4	63.6	14	-22.9	-36%	-23.1	-36%
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotary roadside automatic monitoring station	Colocation roadside	51.0	5-49	89	76	76.0	102	-25.0	-33%	-25.0	-33%
HS2-000020BP8	Hillingdon Council	Triplicate site at South Ruislip roadside automatic monitoring station	Colocation roadside	27.5	No assessed receptor location nearby								
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Colocation background	27.9	1-276	66.1	58.6	57.8	90	-30.7	-52%	-29.9	-52%
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Colocation background	22.5	4-121	59.6	50.8	50.8	84	-28.3	-56%	-28.3	-56%

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Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BPB	Camden Council	Camden High Street	Predicted significant effect	50.2	2-63	62.1	50.7	50.6	68	-0.5	-1%	-0.4	-1%
HS2-000020BPC	Camden Council	Castlehaven Road	Predicted significant effect	26.1	2-93	48.8	42.3	42.7	29	-16.2	-38%	-16.6	-39%
HS2-000020BPD	Camden Council	Prince of Wales Road	Predicted significant effect	24.4	No assessed receptor location nearby								
HS2-000020BPE	Camden Council	Haverstock Hill	Predicted significant effect	32.9	3-41	50.5	42.7	42.7	-9.8	-23	-9.8%	-23	-9.8%
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Predicted significant effect	28.4	3-130	46.3	40.7	40.6	-12.3	-30	-12.2%	-30	-12.3%
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Predicted significant effect	28.3	1-48	60.7	53	53.1	-24.7	-47	-24.8%	-47	-24.7%
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Predicted significant effect	30.2	1-62	61.5	51.5	51.8	-21.3	-41	-21.6%	-42	-21.3%
HS2-000020BPK	Hillingdon Council	Lamp post in crescent off Swakeleys Road	Predicted significant effect	27.8	6-40	48.9	42.7	43.3	-14.9	-35	-15.5%	-36	-14.9%
HS2-000020BPL	Hillingdon Council	Warren Road sign post on corner of Swakeleys Road and Warren Road	Predicted significant effect	31.4	6-31	68.1	59.5	60.6	-28.1	-47	-29.2%	-48	-28.1%
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background not affected by scheme	23.1	N/A (Background location not affected by the scheme)								
HS2-000020BPN	Hillingdon Council	Lamp post on B467	Predicted significant effect	24.8	6-52	44.8	38.7	38.3	42	-13.9	-36%	-13.5	-35%
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Predicted significant effect	28.4	4-104	70.2	60.2	60.2	19	-31.8	-53%	-31.8	-53%
HS2-000020BPP	Hammersmith & Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Predicted significant effect	38.1	4-209	68.7	58.5	58.6	57	-20.4	-35%	-20.5	-35%
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Predicted significant effect	31.1	4-173	75.2	63.8	63.9	33	-32.7	-51%	-32.8	-51%

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Document no: HS2-HS2-EV-REP-000-000222

Revision: P01

Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Predicted significant effect	36.7	4-223	50.5	43.1	43.1	13	-6.4	-15%	-6.4	-15%
HS2-000020BPT	Hammersmith & Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Predicted significant effect	37.3	4-206	64.8	55.3	55.4	59	-18.0	-33%	-18.1	-33%
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Predicted significant effect	35.4	1-4	76.1	62.1	64.1	4	-26.7	-43%	-28.7	-45%
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Predicted significant effect	32.3	1-58	56.1	46.9	46.7	27	-14.6	-31%	-14.4	-31%
HS2-000020BPX	Camden Council	Netley Street	Predicted significant effect	25.5	1-292	83.2	66.6	67.5	87	-41.1	-62%	-42.0	-62%
HS2-000020BPY	Camden Council	Stanhope Street	Predicted significant effect	24.4	1-254	51.5	43.5	43.6	97	-19.1	-44%	-19.2	-44%
HS2-000020BPZ	Camden Council	Albany Street	Predicted significant effect	26.9	1-283	54.1	46.3	45.7	32	-19.4	-42%	-18.8	-41%
HS2-000020BQ0	Camden Council	Werrington Street	Predicted significant effect	25.5	1-191	56.7	50.1	50.9	82	-24.6	-49%	-25.4	-50%
HS2-000020BQ1	Camden Council	Polygon Road	Predicted significant effect	26.7	1-208	50.2	43.1	43.2	57	-16.4	-38%	-16.5	-38%
HS2-000020BQ2	Camden Council	Alexandra Place	Predicted significant effect	23.4	No assessed receptor location nearby								
HS2-000020BQ3	Camden Council	Harrington Square	Predicted significant effect	31.1	1-134	61.5	52.2	53.5	38	-21.1	-40%	-22.4	-42%
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Predicted significant effect	28.4	1-166	65.4	54.4	54.2	39	-26.0	-48%	-25.8	-48%
HS2-000020BQ5	Camden Council	Adelaide Road	Predicted significant effect	28.6	3-211	46.2	39.3	39.5	109	-10.7	-27%	-10.9	-28%
HS2-000020BQ6	Camden Council	Mornington Terrace	Predicted significant effect	23.3	1-246	55.8	46.7	48.7	100	-23.4	-50%	-25.4	-52%
HS2-000020BQ7	Camden Council	Arlington Road	Predicted significant effect	25.5	1-198	51.9	44.1	43.2	23	-18.6	-42%	-17.7	-41%

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Revision: P01

Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BQ8	Camden Council	Clarkson Row	Predicted significant effect	24.9	1-253	50.9	43.8	43.3	56	-18.9	-43%	-18.4	-42%
HS2-000020BQ9	Camden Council	Park Village East	Predicted significant effect	23.1	No assessed receptor location nearby								
HS2-000020BQA	Camden Council	Eversholt Street	Predicted significant effect	33.6	1-192	57.7	51.2	52.0	13	-17.6	-34	-18.4	-35
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Predicted significant effect	24.1	1-322	63.6	50	51.5	5	-25.9	-52	-27.4	-53
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Predicted significant effect	28.2	1-71	63.1	53.5	54.8	32	-25.3	-47	-26.6	-49
HS2-000020BQD	Camden Council	Drummond Crescent	Predicted significant effect	30.7	1-186	66.7	56.8	57.8	58	-26.1	-46	-27.1	-47
HS2-000020BQE	Hammersmith & Fulham Council	Lamp post next to No 11 Wulfstan Street	Predicted significant effect	25.5	4-262	48.1	40.8	40.7	8	-15.3	-38	-15.2	-37
HS2-000020BQF	Ealing Council	Conway Drive sign post	Predicted significant effect	40.6	4-55	63.7	55.2	55.3	36	-14.6	-26	-14.7	-27
HS2-000020BQG	Ealing Council	Lamp post outside No 1. Wells House Road on Old Oak Common Lane	Predicted significant effect	39.4	4-143	52.6	45.2	45.3	6	-5.8	-13	-5.9	-13
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Predicted significant effect	29.8	6-73	45.6	39.0	38.8	59	-9.2	-24	-9.0	-23
HS2-000020BQJ	Camden Council	Grafton Way	Predicted significant effect	38.1	1-4	76.1	62.1	64.1	109	-24.0	-39	-26.0	-41
HS2-000020BQL	Camden Council	Delancey Street	Predicted significant effect	33.7	2-87	62.5	51.4	50.0	19	-17.7	-34	-16.3	-33
HS2-000020BQN	Hillingdon Council	Lamp post on Park Road	Predicted significant effect	32.5	6-62	64.5	54.5	53.8	21	-22.0	-40	-21.3	-40
HS2-000020BQP	Hillingdon Council	Sign post on Long Lane	Predicted significant effect	30.8	No assessed receptor location nearby								
HS2-000020BQQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Predicted significant effect	34.2	4-217	61.5	51.7	51.9	16	-17.5	-34	-17.7	-34



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Revision: P01

Site ID	Local authority	Site location	Site purpose	2020 annual mean NO <sub>2</sub> concentration, annualised and bias adjusted (µg/m <sup>3</sup> )	Nearest ES assessed receptor ID	Modelled annual mean NO <sub>2</sub> 2012 (µg/m <sup>3</sup> )	Modelled annual mean NO <sub>2</sub> 2017 (without scheme, µg/m <sup>3</sup> )	Modelled peak annual mean NO <sub>2</sub> (with scheme, µg/m <sup>3</sup> )	Distance of diffusion tube to nearest ES assessed receptor (m)	Difference monitored 2020 vs 2017 without scheme modelled	% difference 2017 without scheme modelled	Difference monitored 2020 vs with-scheme modelled	% diff with scheme modelled vs 2020 monitored
HS2-000020BQR	Camden Council	Lamp post on Park Village East	Predicted significant effect	24.7	1-284	53.4	45.5	43.0	28	-20.8	-46	-18.3	-43
HS2-000020BQS	Camden Council	Opposite Maria fidelis school on Phoenix Road	Predicted significant effect	26.2	1-269	57.4	51.3	51.7	22	-25.1	-49	-25.5	-49
HS2-000020BQT	Camden Council	Drummond Street	Predicted significant effect	28.5	1-169	64	52.6	51.6	13	-24.1	-46	-23.1	-45
HS2-000020BQU	Westminster City Council	Lamp post outside Edgware Road Station	Predicted significant effect	40.0	1-25	100.3	86.8	86.6	2	-46.8	-54	-46.6	-54
HS2-000020BQV	Kensington and Chelsea Council	Lamp post on St Ann's Street	Predicted significant effect	27.2	4-182	59.5	50.8	50.9	1	-23.6	-46	-23.7	-47
HS2-000020BQW	Hammersmith & Fulham Council	Lamp post on A402 Goldhawk Road (replaced HS2-000020BNX)	Predicted significant effect	26.2	No assessed receptor location nearby								
HS2-000020BQX	Camden Council	Lamp post on Brunswick Square (replaced HS2-000020BM6)	Predicted significant effect	29.0	1-7	61.1	52.5	52.4	67	-23.5	-45%	-23.4	-45%

### Notes:

- HS2-000020BQW replaces HS2-000020BNX as such ES scenario data for HS2-000020BNX6 is used for HS2-000020BQW.
- HS2-000020BQX replaces HS2-000020BM6 as such ES scenario data for HS2-000020BM6 is used for HS2-000020BQX.

# Appendix F – Comparison of the annual mean NO<sub>2</sub> diffusion tube monitoring results

Table 15 and 16 presents a comparison of the annual mean NO<sub>2</sub> diffusion tube results across Phase One and Phase 2a, to date. Sites that were removed / replaced during 2018 have not been included in this comparison.

Table 15: Comparison of the Phase One annual mean NO<sub>2</sub> diffusion tube monitoring results (2016 – 2020)

Site ID	Local Authority	Site Location	Location Type	Annual mean NO <sub>2</sub> diffusion tube monitoring results (µg/m <sup>3</sup> )				
				2016	2017	2018	2019	2020
HS2-000020BM5	Camden Council	Junction of St Chad's Street and Grays Inn Road	Roadside	59.8	50.4	50.4	45.9	36.3
HS2-000020BM6	Camden Council	Brunswick Square	Roadside	50.4	47.4	44	40.3	47.7
HS2-000020BM7	Camden Council	Chalton Street	Roadside	66.8	58.4	54.9	52.0	42.3
HS2-000020BM8	Camden Council	Junction of Euston Square and Grafton Place	Roadside	66.9	58	59.3	56.3	42.1
HS2-000020BM9	Camden Council	Junction of Endsleigh Gardens and Upper Woburn Place	Roadside	59.5	52.4	57.9	49.1	39.5
HS2-000020BMA	Camden Council	Junction of Euston Road and Gower Street	Roadside	70.1	60.3	58.7	51.4	39.3
HS2-000020BMB	Camden Council	Whitfield Street	Background	46.7	45	39	37.2	28.5
HS2-000020BMC	Camden Council	Hampstead Road	Roadside	68	59.1	61.4	61.5	48.2
HS2-000020BMD	Westminster City Council	Lamp post on Park Crescent Road	Roadside	74.2	67.4	66.2	60.0	38.6
HS2-000020BME	Westminster City Council	Lamp post in between A501 and A4201	Roadside	96.7	81.6	85.5	77.2	51.5
HS2-000020BMF	Camden Council	Junction of Polygon Road and Ossulston Street	Background	42.4	35.8	29.7	28.6	23.7
HS2-000020BMH	Camden Council	Nash Street	Background	42.5	39.5	34.8	30.9	27.0
HS2-000020BMJ	Camden Council	Junction on Robert Street and Stanhope Street	Background	44.1	39.1	33.7	29.8	27.6
HS2-000020BMK	Camden Council	Junction of Plender Street and Bayham Street	Roadside	60.5	51.4	49.6	48.2	40.6
HS2-000020BML	Camden Council	Junction of Arlington Road and Mornington Crescent	Background	44.9	38.2	34	30.1	27.1
HS2-000020BMM	Camden Council	Junction of Bayham Street and Pratt Street	Roadside	71.4	67.3	57.4	51.3	41.5
HS2-000020BMN	Camden Council	Junction of Delancey Street and Albert Street	Roadside	45.6	41.9	39.5	36.9	31.1
HS2-000020BMQ	Camden Council	Junction of Parkway and Delancey Street	Roadside	61	48.6	53	44.8	35.5
HS2-000020BMR	Camden Council	Junction of Oval Road and Jamestown Road	Background	43.2	40.1	35.7	31.8	26.4
HS2-000020BMS	Camden Council	Junction of Chalk Farm Road and Castlehaven Road	Roadside	61	50.6	54.6	46.9	38.5
HS2-000020BMT	Camden Council	Junction of Camden Road and Camden Street	Kerbside	88.1	62.4	48.7	44.3	32.8
HS2-000020BMU	Camden Council	Junction of Southampton Road and Fleet Road	Roadside	45	37.3	41.1	37.5	31.6
HS2-000020BMV	Camden Council	Primrose Hill Road	Roadside	43.4	39.3	38.3	33.7	28.1
HS2-000020BMW	Camden Council	Junction of Finchley Road and Hilgrove Road	Roadside	63.7	55.5	52.9	47.4	36.2
HS2-000020BMX	Westminster City Council	Sign post by roundabout on A5205	Roadside	59.3	51.7	49.5	43.0	31.5
HS2-000020BMY	Westminster City Council	Lamp post between Blomfield Road and Edgware Road	Roadside	64.4	57.4	55.9	49.4	35.6

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Document no: HS2-HS2-EV-REP-000-000222

Revision: P01

Site ID	Local Authority	Site Location	Location Type	Annual mean NO <sub>2</sub> diffusion tube monitoring results (µg/m <sup>3</sup> )				
				2016	2017	2018	2019	2020
HS2-000020BMZ	Camden Council	Junction of Finchley Road and Hendon Way	Roadside	93.4	83.9	81.9	75.1	53.6
HS2-000020BN0	Westminster City Council	Lamp post on Ladbroke Grove	Roadside	50.9	45.8	48	48.7	36.2
HS2-000020BN1	Kensington and Chelsea Council	Sign post on St Ann's Villas	Roadside	53.9	43.1	44.5	42.6	36.0
HS2-000020BN2	Hammersmith & Fulham Council	Lamp post on Du Cane Road	Roadside	61.2	57.8	55.1	44.8	36.2
HS2-000020BN3	Brent Council	Sign post on High Street Harlesden	Roadside	65.7	52.5	56.1	50.2	42.3
HS2-000020BN4	Hammersmith & Fulham Council	End of cycle lane sign on Old Oak Road	Roadside	68.7	52.6	51.9	44.0	36.6
HS2-000020BN5	Ealing Council	Sign post on Victoria Road	Roadside	58.5	50.5	51.9	48.7	37.4
HS2-000020BN7	Ealing Council	The Approach street sign	Roadside	67.6	61.0	56	52.4	41.3
HS2-000020BNA	Camden Council	Junction of Regent's Park Road and Rothwell Street	Roadside	42.3	38.5	36.5	31.4	24.8
HS2-000020BNB	Camden Council	Junction of Gloucester Gate Bridge and Park Village East	Roadside	50.2	42.4	43.5	33.4	-
HS2-000020BNC	Camden Council	Junction of Outer Circle and Gloucester Gate	Background	32.4	28.8	30.2	25.6	18.4
HS2-000020BND	Westminster City Council	Outer Circle Regent's Park	Kerbside	42.7	40.1	35	31.8	22.9
HS2-000020BNG	Brent Council	Lamp post on Donnington Road	Roadside	45.5	38.6	39.6	38.0	31.7
HS2-000020BNH	Camden Council	Junction of Parkway and Albert Street	Kerbside	49.6	39.8	38.2	34.5	26.4
HS2-000020BNJ	Westminster City Council	Light post on Park Road	Roadside	66.3	54.1	55	47.6	35.7
HS2-000020BNL	Westminster City Council	Lamp post on Penfold Street	Background	46.4	43.8	38.5	31.8	27.5
HS2-000020BNN	Camden Council	Lincoln's Inn Fields	Background	38.6	36.9	35.6	31.3	25.0
HS2-000020BNQ	Camden Council	Camley Street	Background	47.5	41.1	37.4	29.6	27.1
HS2-000020BNR	Hammersmith & Fulham Council	Lamp posts in Shepherd's Bush Common	Background	49.5	39.6	38.9	34.2	29.8
HS2-000020BNS	Brent Council	Lamp post on Tower Road by Willesden Jewish Cemetery	Background	34.1	30.6	27.4	25.3	21.9
HS2-000020BNT	Hillingdon Council	Lamp post on Pembroke Road	Background	-	30.6	25.3	23.4	20.3
HS2-000020BNU	Hillingdon Council	Cowley Road sign post at junction with Hillingdon Road	Roadside	-	47	45.8	41.1	33.7
HS2-000020BNV	Hillingdon Council	High Street sign post at junction with Pembroke Road	Roadside	-	37	43	37.7	30.5
HS2-000020BNW	Hillingdon Council	Signpost on A4020 Uxbridge Road at junction with Long Lane	Roadside	-	43.3	46.4	40.9	31.9
HS2-000020BNX	Hammersmith & Fulham Council	Signpost on A402 Goldhawk Road	Roadside	48.5	38.6	41.8	39.5	-
HS2-000020BNY	Camden Council	Junction of Mill Lane and Hillfield Road	Roadside	43.8	42.7	41.8	39.3	30.8
HS2-000020BNZ	Camden Council	Mansfield Road	Roadside	36.4	37.4	35.8	31.7	27.1
HS2-000020BP0	Camden Council	Junction of Camden Road and Torriano Avenue	Roadside	60.6	55	61.1	50.7	40.6
HS2-000020BP1	Westminster City Council	Lamp post on Brook Street	Roadside	61.8	58.7	63.3	54.0	34.7
HS2-000020BP2	Camden Council	Junction of Grays Inn Road and Holborn	Roadside	52	46.8	48.7	43.8	30.5
HS2-000020BP3	Westminster City Council	Triplicate site next to the Marylebone Road kerbside automatic monitoring stations	Kerbside	86.8	74.3	69.9	58.3	42.4

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Revision: P01

Site ID	Local Authority	Site Location	Location Type	Annual mean NO <sub>2</sub> diffusion tube monitoring results (µg/m <sup>3</sup> )				
				2016	2017	2018	2019	2020
HS2-000020BP4	Camden Council	Triplicate site on Finchley Road next to Swiss Cottage kerbside automatic monitoring station	Kerbside	66.6	62.1	60.6	44.2	33.8
HS2-000020BP5	Camden Council	Triplicate site next to the Euston Road roadside automatic monitoring stations	Roadside	86.7	76.2	80.8	66.2	46.9
HS2-000020BP6	Ealing Council	Triplicate site next to the Ealing, Western Avenue Acton roadside automatic monitoring station	Roadside	64.7	57.3	56.2	50.6	40.5
HS2-000020BP7	Ealing Council	Triplicate site next to the Ealing, Hangar Lane Gyrotory roadside automatic monitoring station	Roadside	72.3	71.9	70.2	63.1	51.0
HS2-000020BP8	Hillingdon Council	Triplicate site at South Ruislip roadside automatic monitoring station	Roadside	-	-	37.8	36.4	27.5
HS2-000020BP9	Camden Council	Triplicate site in Russell Square next to Bloomsbury urban background automatic monitoring station	Background	39.2	38.7	35.7	32.5	27.9
HS2-000020BPA	Kensington and Chelsea Council	Triplicate site at Sion Manning School, St. Charles' square, next to the North Kensington urban background automatic monitoring stations	Background	36.2	30.7	28.4	26.2	22.5
HS2-000020BPB	Camden Council	Camden High Street	Roadside	74.6	66	69.1	60.1	50.2
HS2-000020BPC	Camden Council	Castlehaven Road	Background	41	36.6	31.5	32.1	26.1
HS2-000020BPD	Camden Council	Prince of Wales Road	Roadside	36.8	34.4	33.8	30.0	24.4
HS2-000020BPE	Camden Council	Haverstock Hill	Roadside	48.3	44.3	43	42.2	32.9
HS2-000020BPF	Camden Council	Junction of Primrose Gardens and England's Lane	Background	40.9	37.2	31.9	31.8	28.4
HS2-000020BPG	Westminster City Council	Lamp post on St John's Wood Street	Roadside	49.8	43.2	43.4	38.5	28.3
HS2-000020BPH	Westminster City Council	Lamp post St John's Wood Terrace	Roadside	49	45.7	42.7	39.5	30.2
HS2-000020BPK	Hillingdon Council	Lamp post in crescent off Swakeleys Road	Roadside	-	-	35.8	34.9	27.8
HS2-000020BPL	Hillingdon Council	Warren Road sign post on corner of Swakeleys Road and Warren Road	Roadside	-	-	41.3	37.6	31.4
HS2-000020BPM	Brent Council	Lamp post along Gorefield Place near block of flats	Background	38	32.1	27.8	27.2	23.1
HS2-000020BPN	Hillingdon Council	Lamp post on B467	Roadside			31	31.0	24.8
HS2-000020BPO	Kensington and Chelsea Council	Lamp post off Silchester Road	Roadside	45.3	38.5	38.7	36.7	28.4
HS2-000020BPP	Hammersmith & Fulham Council	Sign post on A219 Scrubs Lane, South of Harrow Road	Roadside	54.4	46.3	46.3	46.5	38.1
HS2-000020BPR	Kensington and Chelsea Council	Lamp post at junction of Crowthorne Road and Bramley Road	Roadside	49.2	43	43.7	41.0	31.1
HS2-000020BPS	Kensington and Chelsea Council	Lamp post by fence on B450 Ladbroke Grove, south of A404 Harrow Road	Roadside	54.2	44.5	45.6	45.6	36.7
HS2-000020BPT	Hammersmith & Fulham Council	Controlled Zone/Zone Ends road sign on A219 Scrubs Lane, north of Hythe Road	Roadside	57.3	45.5	47.6	47.0	37.3
HS2-000020BPU	Camden Council	Junction of Gower Street and Grafton Way	Roadside	59.7	51.5	50.5	47.6	35.4
HS2-000020BPW	Camden Council	Junction of Delancey Street and Arlington Road	Roadside	53.4	42.9	45	40.2	32.3
HS2-000020BPX	Camden Council	Netley Street	Background	41.5	36	35.9	33.2	25.5
HS2-000020BPY	Camden Council	Stanhope Street	Background	38.3	32.4	32.2	28.9	24.4
HS2-000020BPZ	Camden Council	Albany Street	Roadside	47.4	39.5	40.4	38.5	26.9

## Air Quality Annual Report 2020

Document no: HS2-HS2-EV-REP-000-000222

Revision: P01

Site ID	Local Authority	Site Location	Location Type	Annual mean NO <sub>2</sub> diffusion tube monitoring results (µg/m <sup>3</sup> )				
				2016	2017	2018	2019	2020
HS2-000020BQ0	Camden Council	Werrington Street	Background	<b>41.8</b>	33.9	32.1	29.4	25.5
HS2-000020BQ1	Camden Council	Polygon Road	Background	39.7	35	34	31.6	26.7
HS2-000020BQ2	Camden Council	Alexandra Place	Background	34.8	31.6	28.7	27.6	23.4
HS2-000020BQ3	Camden Council	Harrington Square	Kerbside	<b>53.8</b>	<b>45.5</b>	<b>44.6</b>	<b>40.6</b>	31.1
HS2-000020BQ4	Camden Council	Junction of North Gower Street and Starcross Street	Background	<b>43.8</b>	39.2	37.7	33.2	28.4
HS2-000020BQ5	Camden Council	Adelaide Road	Roadside	<b>54.6</b>	<b>43</b>	39.9	37.6	28.6
HS2-000020BQ6	Camden Council	Mornington Terrace	Background	<b>47.8</b>	35.2	33.2	28.9	23.3
HS2-000020BQ7	Camden Council	Arlington Road	Background	<b>52.4</b>	34.9	32.1	28.9	25.5
HS2-000020BQ8	Camden Council	Clarkson Row	Background	-	35.3	32.6	28.9	24.9
HS2-000020BQ9	Camden Council	Park Village East	Background	<b>49</b>	32.7	30.8	27.1	23.1
HS2-000020BQA	Camden Council	Eversholt Street	Kerbside	<b>71.3</b>	<b>53.6</b>	<b>49</b>	<b>45.6</b>	33.6
HS2-000020BQB	Camden Council	Junction of Harrington Street and Varndell Street	Background	<b>54.1</b>	33.4	35	29.0	24.1
HS2-000020BQC	Camden Council	Junction of Robert Street and Hampstead Road	Kerbside	<b>59.3</b>	39.7	<b>41.3</b>	36.3	28.2
HS2-000020BQD	Camden Council	Drummond Crescent	Background	<b>58.7</b>	<b>41.2</b>	39.5	35.3	30.7
HS2-000020BQE	Hammersmith & Fulham Council	Lamp post next to No 11 Wulfstan Street	Background	<b>52.7</b>	36.8	32.6	28.6	25.5
HS2-000020BQF	Ealing Council	Conway Drive sign post	Roadside	<b>76.2</b>	<b>57</b>	<b>58.5</b>	<b>53.3</b>	<b>40.6</b>
HS2-000020BQG	Ealing Council	Lamp post outside No 1, Wells House Road on Old Oak Common Lane	Roadside	<b>75</b>	<b>64</b>	<b>58</b>	<b>48.9</b>	39.4
HS2-000020BQH	Hillingdon Council	Lamp post on High Road Ickenham	Roadside	-	37.2	<b>41.6</b>	38.1	29.8
HS2-000020BQJ	Camden Council	Grafton Way	Background	-	<b>54.2</b>	<b>51.2</b>	<b>51.3</b>	38.1
HS2-000020BQL	Camden Council	Delancey Street	Roadside	-	<b>49.3</b>	<b>51</b>	<b>44.8</b>	33.7
HS2-000020BQN	Hillingdon Council	Lamp post on Park Road	Roadside	-	-	<b>50.1</b>	<b>44.5</b>	32.5
HS2-000020BQP	Hillingdon Council	Sign post on Long Lane	Roadside	-	-	<b>41.8</b>	<b>40.9</b>	30.8
HS2-000020BQQ	Kensington and Chelsea Council	Lamp post along Ladbroke Grove, near shops and bus stop at Trevorton Road junction	Kerbside	-	-	<b>48.2</b>	<b>44.3</b>	34.2
HS2-000020BQR	Camden Council	Lamp post on Park Village East	Background	-	-	34.8	29.3	24.7
HS2-000020BQS	Camden Council	Opposite Maria fidelis school on Phoenix Road	Background	-	-	33.1	30.9	26.2
HS2-000020BQT	Camden Council	Drummond Street	Background	-	-	38.8	35.7	28.5
HS2-000020BQU	Westminster City Council	Lamp post outside Edgware Road Station	Kerbside	-	-	<b>61.9</b>	<b>61.6</b>	<b>40.0</b>
HS2-000020BQV	Kensington and Chelsea Council	Lamp post on St Ann's Street	Kerbside	-	-	-	35.0	27.2
HS2-000020BQW	Hammersmith & Fulham Council	Lamp post on A402 Goldhawk Road (replaced HS2-000020BNX)	Kerbside	-	-	-	-	26.2
HS2-000020BQX	Camden Council	Lamp post on Brunswick Square (replaced HS2-000020BM6)	Roadside	-	-	-	-	29.0

### Notes:

- Exceedances of the NO<sub>2</sub> annual mean air quality standard of 40 µg/m<sup>3</sup> are shown in bold.

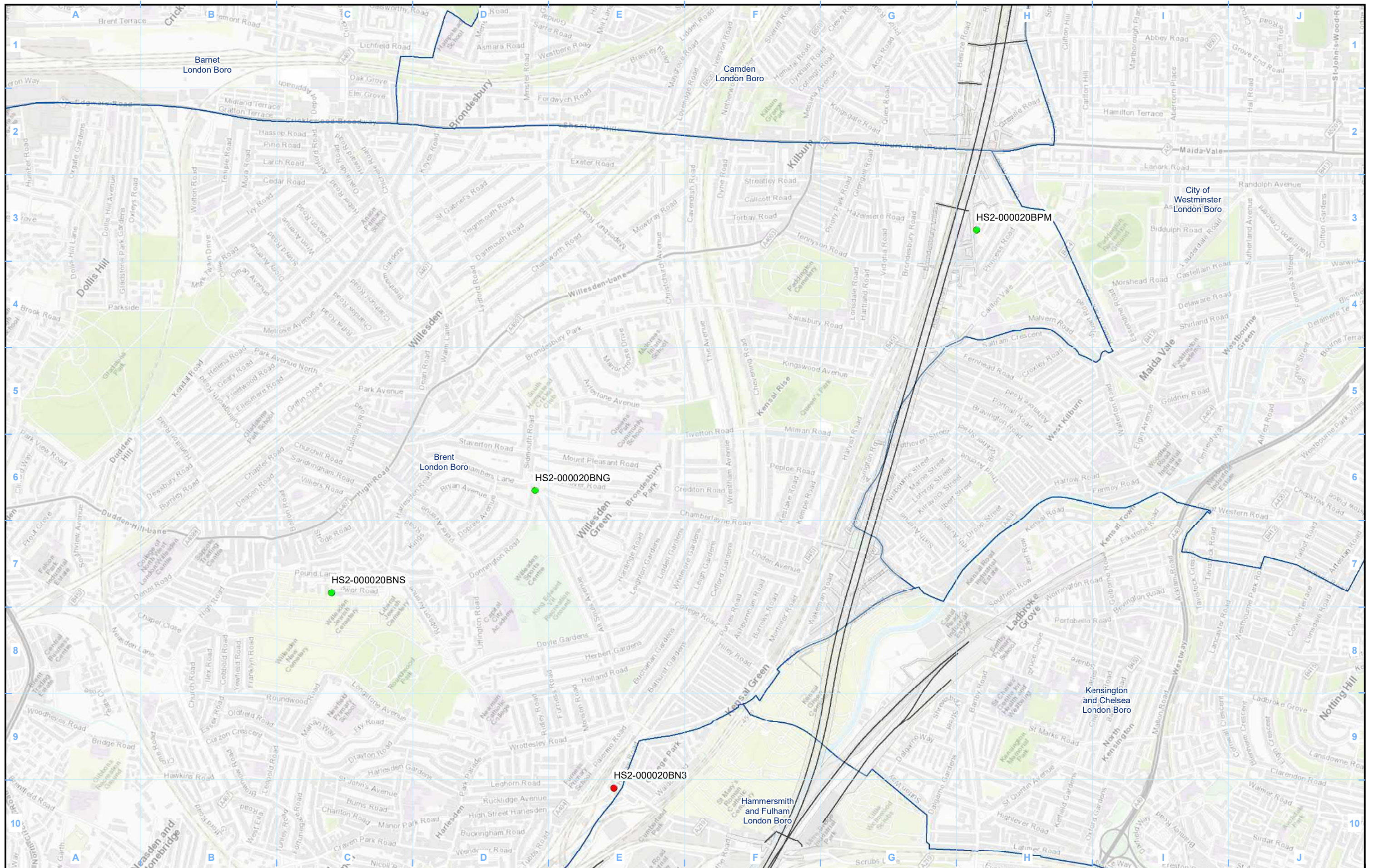
Table 16: Comparison of the Phase 2a annual mean NO<sub>2</sub> diffusion tube monitoring results (2019 – 2020)

Site ID	Local Authority	Site Location	Location Type	Annual mean NO <sub>2</sub> diffusion tube monitoring results (µg/m <sup>3</sup> )	
				2019	2020
1	Staffordshire	South-west of Stafford (CA2) – Ashflats Lane	Roadside	13.7	8.8
2	Staffordshire	South-west of Stafford (CA2) – Ash Rise	Suburban	18.3	13.1
3	Staffordshire	South-west of Stafford (CA2) – Barn Bank Lane	Suburban	26.8	19.7
4	Staffordshire	South-west of Stafford (CA2) – Southfields Close	Suburban	27.8	21.4
5	Staffordshire	South-west of Stafford (CA2) – Devon Way	Suburban	28.0	21.1
6	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road E	Roadside	20.2	16.4
7	Staffordshire	South-west of Stafford (CA2) – Burton Manor Road W	Kerbside	21.5	14.7
8	Staffordshire	South-west of Stafford (CA2) – Crinan Grove	Suburban	24.4	17.2
9	Newcastle under Lyme	Madeley Heath (CA4) – Newcastle Road	Roadside	27.6	20.8
10	Cheshire East Council	Oakhanger (CA5) – Nursery Road	Rural	16.4	11.9

# Appendix G – Maps of HS2 monitoring survey locations and 2020 results

Figure 1 - 10: Maps of HS2 monitoring survey locations and 2020 results





**Legend**

**2020 NO<sub>2</sub> Monitoring**

- < 40 µg/m<sup>3</sup> (below AQS)
- ≥ 40 µg/m<sup>3</sup> (above AQS)

— Work Sections Centreline

▭ Consolidated Land Boundary

▭ District Borough Unitary Boundaries



Map Number  
**HS2-HS2-EV-REP-000-000201**

Map Name  
**Phase 1 NO<sub>2</sub> Monitoring Positions  
London Borough of Brent**

(1 of 8)

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Scale at A3: 1:15,000

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Metres

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Doc Number: **HS2-000020BPM**

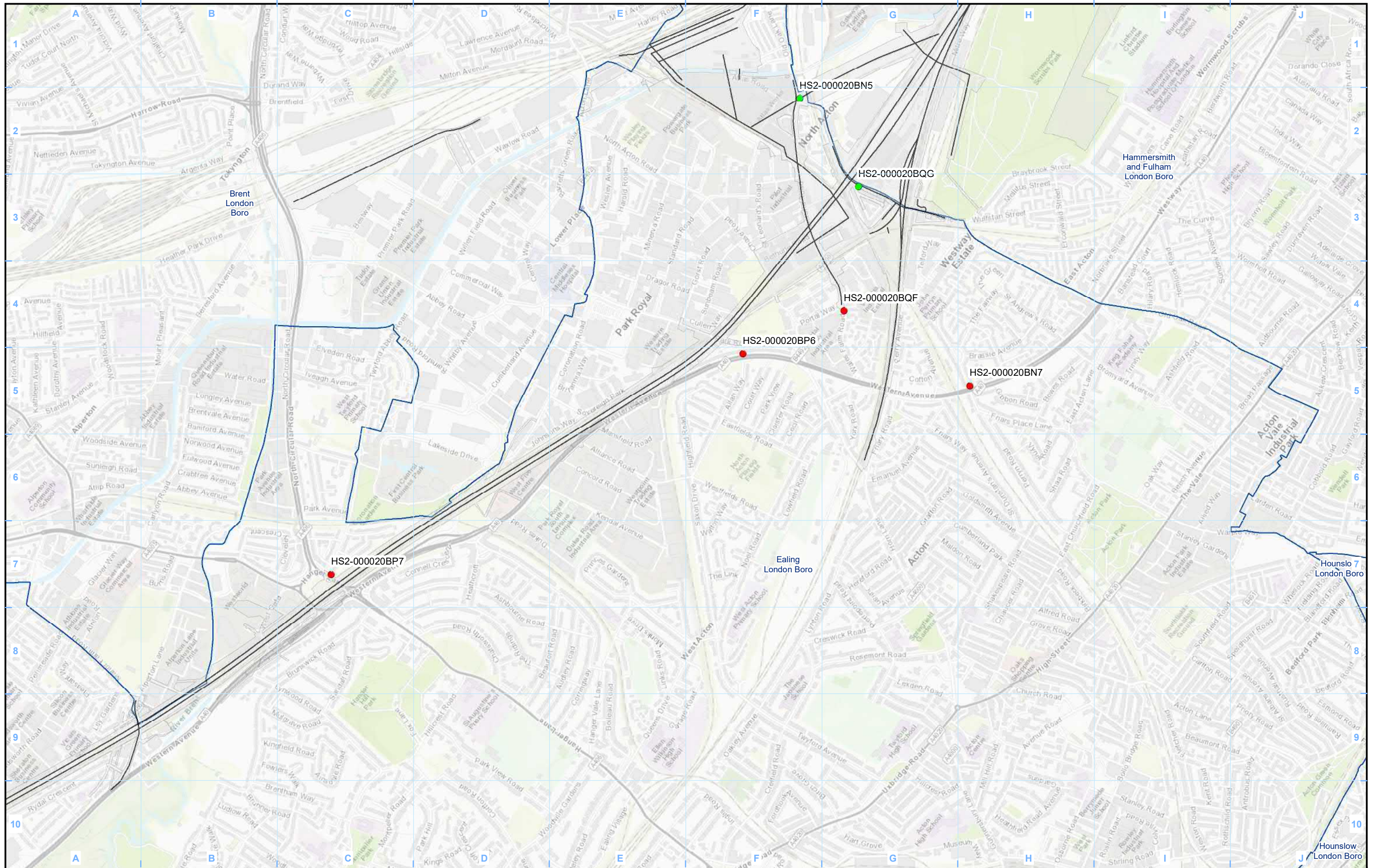
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**Legend**

**2020 NO<sub>2</sub> Monitoring**

- < 40 µg/m<sup>3</sup> (below AQS)
- ≥ 40 µg/m<sup>3</sup> (above AQS)

— Work Sections Centreline

▭ Consolidated Land Boundary

▭ District Borough Unitary Boundaries



Map Number  
**HS2-HS2-EV-REP-000-000201**

Map Name  
**Phase 1 NO<sub>2</sub> Monitoring Positions  
London Borough of Ealing**

(3 of 8)

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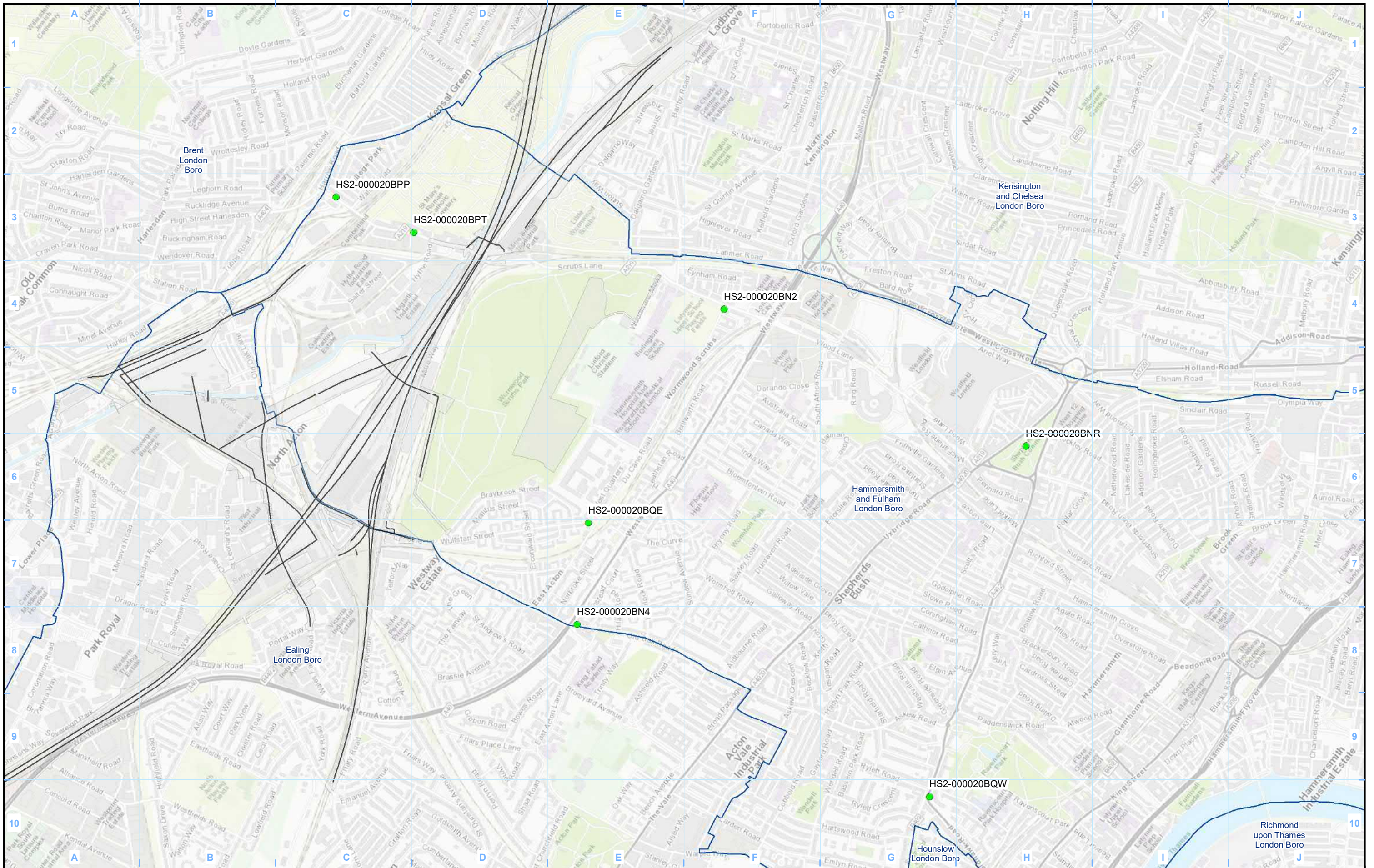
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**Legend**

**2020 NO<sub>2</sub> Monitoring**

- < 40 µg/m<sup>3</sup> (below AQS)
- ≥ 40 µg/m<sup>3</sup> (above AQS)

- Work Sections Centreline
- ▭ Consolidated Land Boundary
- ▭ District Borough Unitary Boundaries



Map Number  
**HS2-HS2-EV-REP-000-000201**

Map Name  
**Phase 1 NO<sub>2</sub> Monitoring Positions  
London Borough of Hammersmith  
and Fulham**

(4 of 8)

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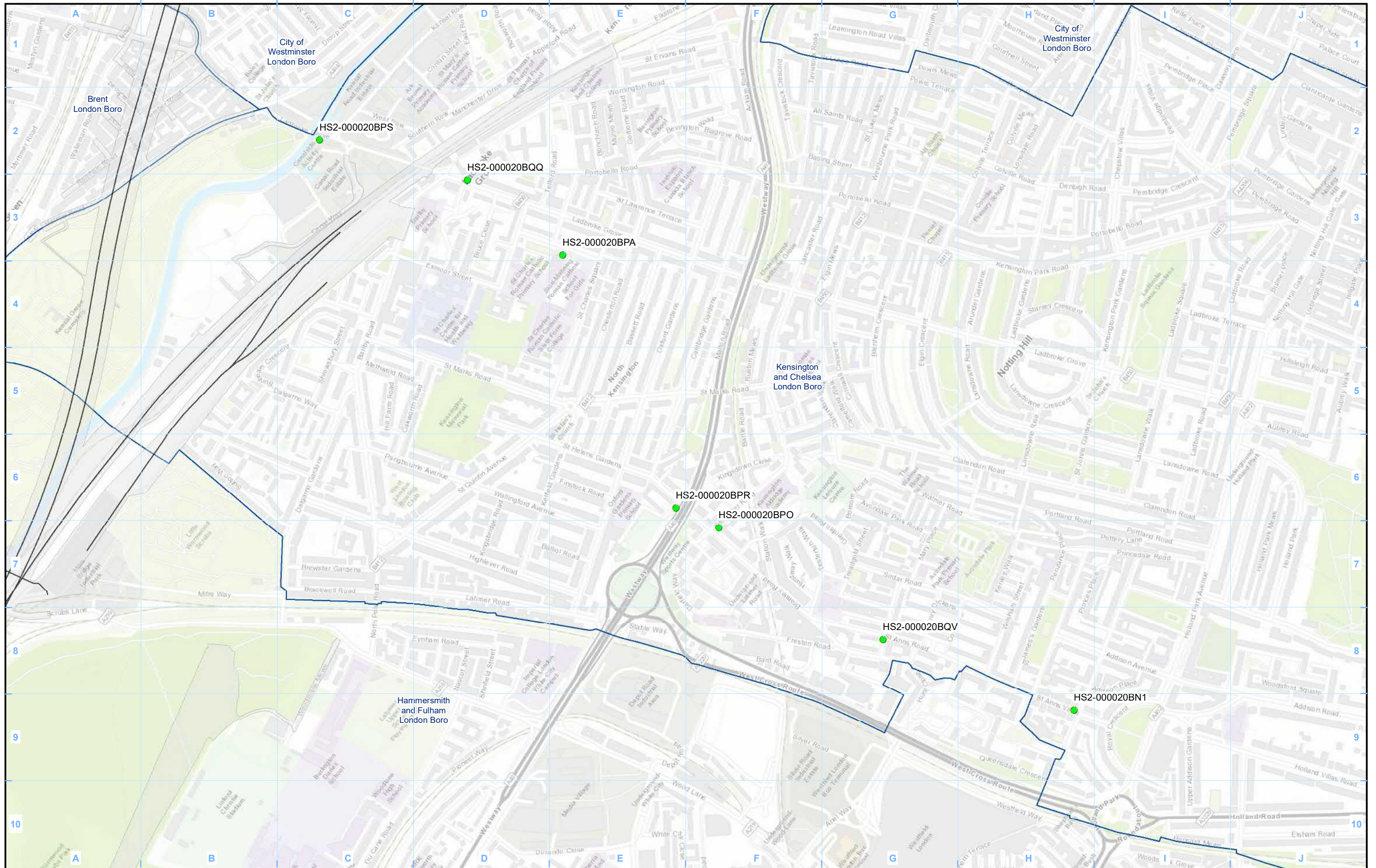
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**Legend**

**2020 NO<sub>2</sub> Monitoring**

- < 40 µg/m<sup>3</sup> (below AQS)
- ≥ 40 µg/m<sup>3</sup> (above AQS)

— Work Sections Centreline

▭ Consolidated Land Boundary

▭ District Borough Unitary Boundaries



Map Number  
**HS2-HS2-EV-REP-000-000201**

Map Name  
**Phase 1 NO<sub>2</sub> Monitoring Positions  
London Borough of Kensington  
and Chelsea**

(5 of 8)

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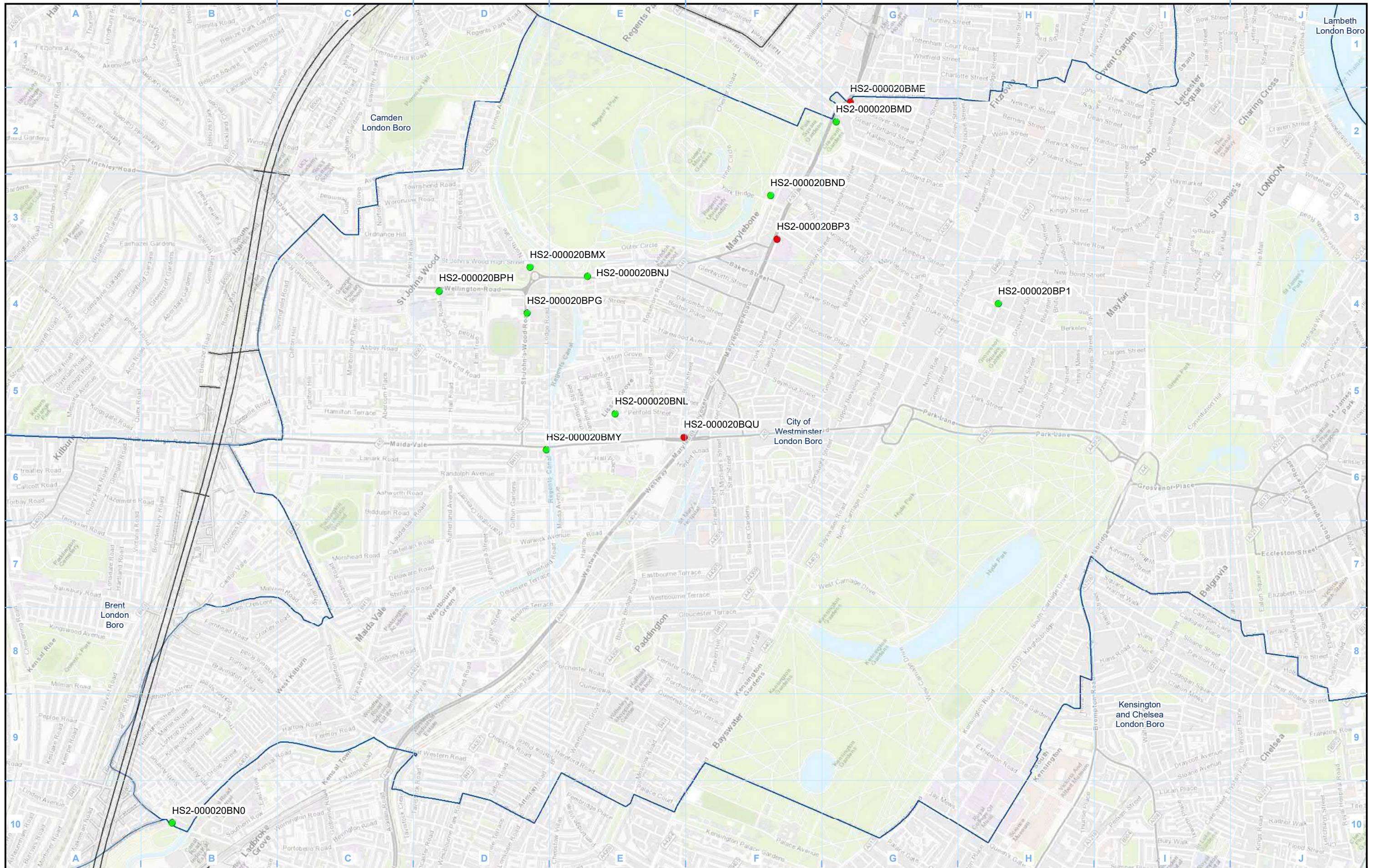
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- Legend**
- 2020 NO<sub>2</sub> Monitoring < 40 µg/m<sup>3</sup> (below AQS)
  - 2020 NO<sub>2</sub> Monitoring ≥ 40 µg/m<sup>3</sup> (above AQS)
  - Work Sections Centreline
  - ▭ Consolidated Land Boundary
  - ▭ District Borough Unitary Boundaries



Map Number  
**HS2-HS2-EV-REP-000-000201**

Map Name  
**Phase 1 NO<sub>2</sub> Monitoring Positions  
 City of Westminster**

(6 of 8)

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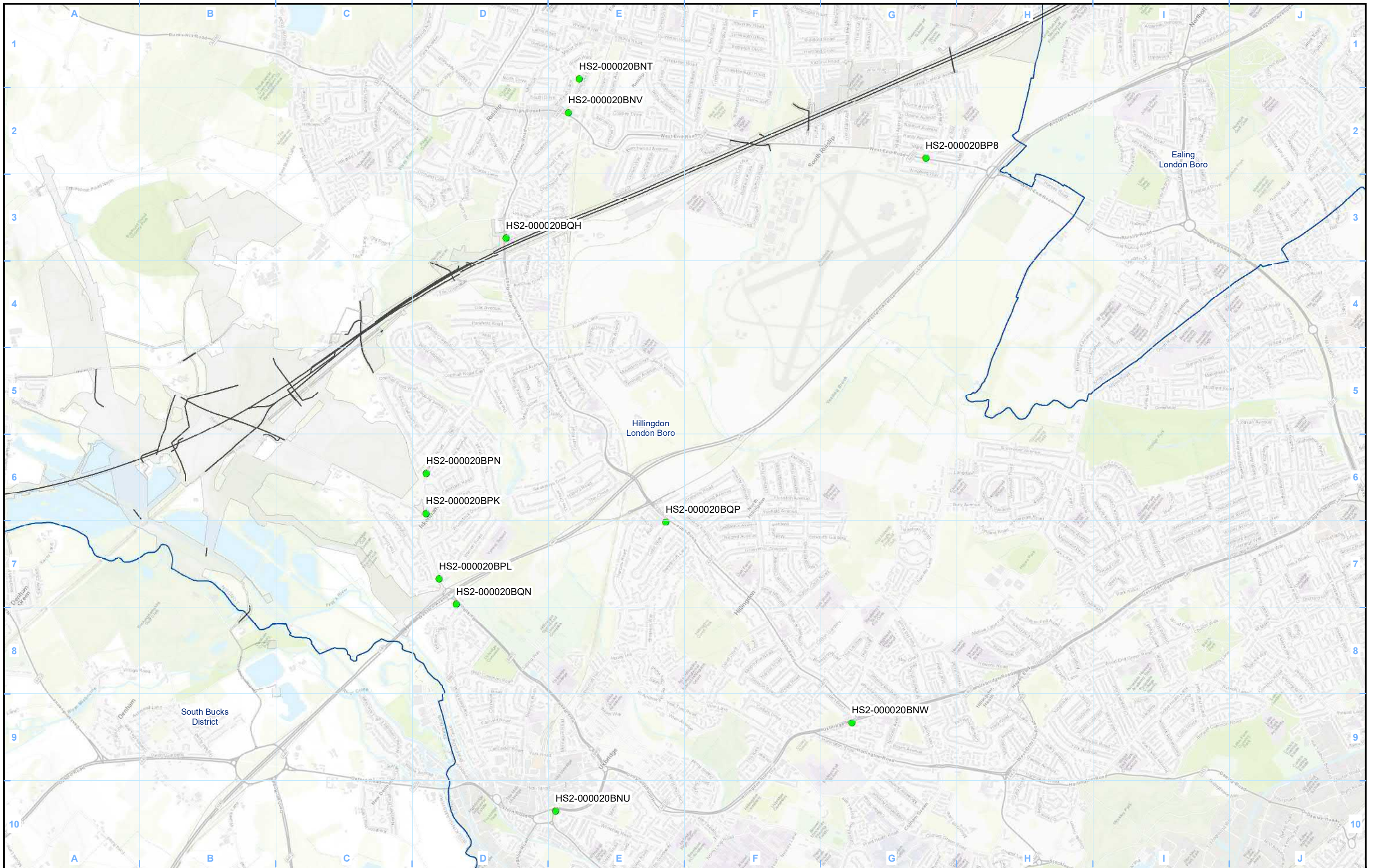
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Doc Number: Date: 25/10/21

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**Legend**

**2020 NO<sub>2</sub> Monitoring**

- < 40 µg/m<sup>3</sup> (below AQS)
- ≥ 40 µg/m<sup>3</sup> (above AQS)

- Work Sections Centreline
- ▭ Consolidated Land Boundary
- ▭ District Borough Unitary Boundaries

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Map Number  
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Map Name  
Phase 1 NO<sub>2</sub> Monitoring Positions  
London Borough of Hillingdon

(7 of 8)

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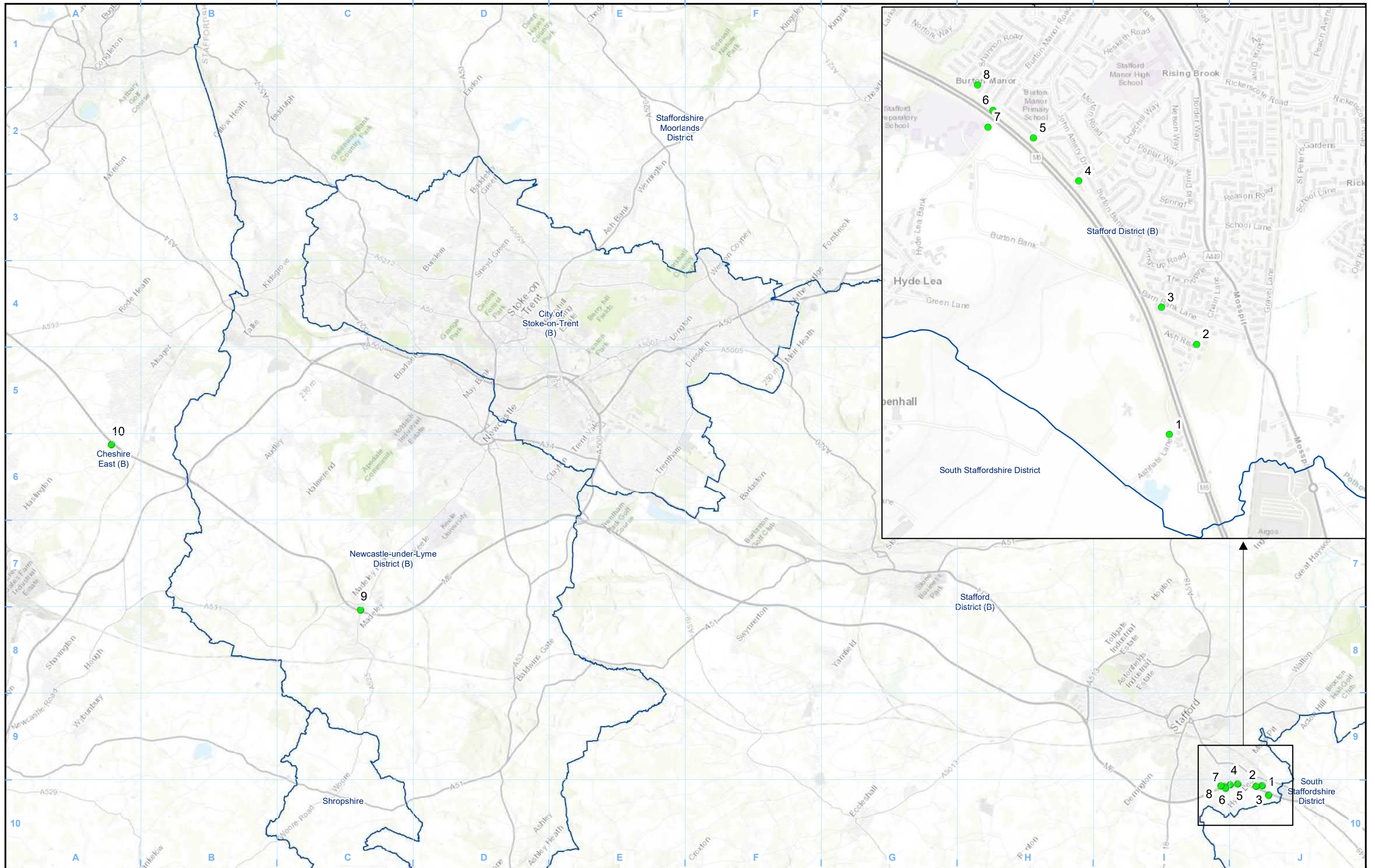
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Metres

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**2020 NO<sub>2</sub> Monitoring**

- < 40 µg/m<sup>3</sup> (below AQS)
- ≥ 40 µg/m<sup>3</sup> (above AQS)

- Work Sections Centreline
- ▭ Consolidated Land Boundary
- ▭ District Borough Unitary Boundaries



Map Number  
HS2-HS2-EV-REP-000-000201

Map Name  
Phase 1 NO<sub>2</sub> Monitoring Positions  
Baseline Monitoring in Staffordshire, Newcastle  
under-Lyme and Cheshire East

(8 of 8)

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