# London Borough of Ealing Air Quality Annual Status Report for 2023

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This report provides a detailed overview of air quality in London Borough of Ealing during 2023. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

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## Abbreviations

| Abbreviation | Description |
|---|---|
| AQAP | Air Quality Action Plan |
| AQMA | Air Quality Management Area |
| AQO | Air Quality Objective |
| AQG | Air Quality Guidelines |
| AQS | Air Quality Strategy |
| AURN | Automatic Urban and Rural Network |
| BAM | Beta Attenuation Monitor |
| CHP | Combined Heat and Power |
| COP26 | Conference of the Parties (2021 United Nations Climate Change Conference) |
| CYP | Children and Young People |
| DPD | Development Plan Document |
| DPH | Department of Public Health |
| EV | Electric Vehicle |
| EVCP | Electric Vehicle Charge Point |
| FDMS | Filter Dynamics Measurement System |
| GLA | Greater London Authority |
| HPF | Health Protection Forum |
| JSNA | Joint Strategic Needs Assessment |
| LAQM | Local Air Quality Management |
| LAQN | London Air Quality Network |
| LES | Low Emission Strategy |
| LLAQM | London Local Air Quality Management |
| MAQF | Mayor's Air Quality Fund |
| NHS | National Health Service |
| $NO_2$ | Nitrogen dioxide |
| $NO_x$ | Nitrogen oxides |
| NRMM | Non-Road Mobile Machinery |

| Abbreviation | Description |
|---|---|
| $PM_{10}$ | Particulate matter less than 10 micron in diameter |
| $PM_{2.5}$ | Particulate matter less than 2.5 micron in diameter |
| QA/QC | Quality assurance and quality control. |
| STARS | Sustainable Travel: Active, Responsible, Safe |
| TEOM | Tapered Element Oscillating Microbalance |
| TfL | Transport for London |
| VCM | Volatile Correction Model |
| WHO | World Health Organisation |

## Table A. Summary of National Air Quality and International Standards, Objectives and Guidelines

| Pollutant | Standard / Objective / Guideline | Averaging Period | Date[1] |
|---|---|---|---|
| Nitrogen dioxide ($NO_2$) | 200 µg $m^{-3}$ not to be exceeded more than 18 times a year | 1-hour mean | 31 Dec 2005 |
| Nitrogen dioxide ($NO_2$) | 40 µg $m^{-3}$ | Annual mean | 31 Dec 2005 |
| Nitrogen dioxide ($NO_2$) | WHO AQG[2]: 10 µg $m^{-3}$ | Annual mean | |
| Particles ($PM_{10}$) | 50 µg $m^{-3}$ not to be exceeded more than 35 times a year | 24-hour mean | 31 Dec 2004 |
| Particles ($PM_{10}$) | WHO AQG[2]: 45 µg $m^{-3}$ not to be exceeded more than 3-4 times a year | 24-hour mean | |
| Particles ($PM_{10}$) | 40 µg $m^{-3}$ | Annual mean | 31 Dec 2004 |
| Particles ($PM_{10}$) | WHO AQG[2]: 15 µg $m^{-3}$ | Annual mean | |
| Particles ($PM_{2.5}$) | 20 µg $m^{-3}$ | Annual mean | 2020 |
| Particles ($PM_{2.5}$) | London Mayoral Objective[3]: 10 µg $m^{-3}$ | Annual mean | 2030 |
| Particles ($PM_{2.5}$) | WHO AQG[2]: 5 µg $m^{-3}$ | Annual mean | |
| Particles ($PM_{2.5}$) | Target of 15% reduction in concentration at urban background locations | 3-year mean | Between 2010 and 2021 |
| Particles ($PM_{2.5}$) | WHO AQG[2]: 15 µg $m^{-3}$ | 24-hour mean | |
| Sulphur dioxide ($SO_2$) | 266 µg $m^{-3}$ not to be exceeded more than 35 times a year | 15-minute mean | 31 Dec 2005 |
| Sulphur dioxide ($SO_2$) | 350 µg $m^{-3}$ not to be exceeded more than 24 times a year | 1-hour mean | 31 Dec 2004 |
| Sulphur dioxide ($SO_2$) | 125 µg $m^{-3}$ mot to be exceeded more than 3 times a year | 24-hour mean | 31 Dec 2004 |
| Sulphur dioxide ($SO_2$) | WHO AQG[2]: 40 µg $m^{-3}$ not to be exceeded more than 3-4 times a year | 24-hour mean | |

**Notes:**

(1) Date by which to be achieved by and maintained thereafter

(2) 2021 World Health Organisation Air Quality Guidelines

(3) London Mayoral Objective

# 1. Air Quality Monitoring

## 1.1 Locations

In 2023, four automatic monitoring stations were operational in the London Borough of Ealing as part of the London Air Quality Network (LAQN). These include Ealing Acton Vale, an urban background site, two roadside sites (Ealing Hanger Lane Gyratory and Ealing Western Avenue) and one industrial site (Ealing Horn Lane). Two different $PM_{10}$ analysers are active at the Horn Lane monitoring station, a TEOM and a BAM. Consistent with the LAQN classification, data from the two instruments are reported as two separate stations (EA8 Horn Lane and EI8 Horn Lane TEOM).

In addition, automatic monitoring at Southall Gasworks commenced during November 2021. This monitor, Ealing Green Quarter, was commissioned as part of two year independent air quality monitoring programme at the Southall Gasworks site. This monitoring station is not part of LAQN but is instead operated by Air Quality England (AQE). This site was decommissioned in November 2023.

Furthermore, the council added two air quality sensors for $NO_2$, $PM_{10}$ and $PM_{2.5}$ at Southall Gasworks during December 2021 named Green Quarter North (Sensor) and Green Quarter South (Sensor). Both these sites were decommissioned in November 2023. Sensor data is not required for compliance reporting and hence these sites have not been included in this ASR. However, the historical results for both sites are available to view on the AQE Website (https://www.airqualityengland.co.uk).

Details of the relevant Quality Assurance/Quality Control (QA/QC) procedures that were followed during the monitoring are provided in Appendix A. Figure 13 in Appendix C and Table B provide details of the automatic monitoring sites located in the Borough. All the currently operational automatic monitoring sites measure nitrogen dioxide ($NO_2$) and Particulate Matter ($PM_{10}$).

**Table B. Details of Automatic Monitoring Sites for 2023**

| Site ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Inlet Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA6 Hanger Lane Gyratory | Hanger Lane Gyratory | Roadside | 518537 | 182708 | $NO_2$, $PM_{10}$ | Y-Ealing | Chemiluminescence, TEOM | 4 | 3 | 2.0 |
| EA8 Horn Lane | Horn Lane | Industrial | 520432 | 181428 | $NO_2$, $PM_{10}$ | Y-Ealing | Chemiluminescence, $PM_{10}$ by BAM | 8 | 2.5 | 1.8 |
| EI8 Horn Lane | Horn Lane | Industrial | 520432 | 181428 | $NO_2$, $PM_{10}$ | Y-Ealing | TEOM | 8 | 2.5 | 1.8 |
| EI1 Western Avenue | Western Avenue | Roadside | 520430 | 181950 | $NO_2$, $PM_{10}$ | Y-Ealing | Chemiluminescence, TEOM | 4 | 4 | 2.0 |
| EI3 Acton Vale | Acton Vale | Urban Background | 521134 | 179771 | $NO_2$, $PM_{10}$ | Y-Ealing | Chemiluminescence, $PM_{10}$ by FDMS | N/A | N/A | 2.55 |
| EA010 Green Quarter | Green Quarter | Suburban Background | 511740 | 180048 | $NO_2$, $PM_{10}$, $PM_{2.5}$ | Y-Ealing | Chemiluminescence, PM10 & PM2.5 by FIDAS | 20 | 40 | 1.8 |

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable

During 2023, the London Borough of Ealing also monitored annual mean $NO_2$ concentrations using a network of 66 passive diffusion tubes across 60 locations. There are three triplicate diffusion tube sites, co-located with three of the automatic air quality monitoring stations. Figure 12 in Appendix C and Table C provide details of the diffusion tube sites operated within the borough during 2023.

In 2023, there were minimal changes to the diffusion tube network. A total of eight sites were relocated, with all changes within 5 metres. These changes generally do not significantly change exposure and therefore do not affect monitoring concentrations, except for EA53 which is discussed further in Section 1.2. All of these changes are outlined in Table C with new coordinates reported where relevant.

**Table C. Details of Non-Automatic Monitoring Sites for 2023**

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA1 | 2 Horsenden Lane South, Greenford, UB6 8AB | Roadside | 516368 | 182978 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA2 | 1 Kirn Road, West Ealing, W13 0UB | Roadside | 516704 | 180505 | $NO_2$ | Y- Ealing | 4.0 | 1.0 | No | 2-2.5 |
| EA3 | Brent Lodge Park,Church Road, Hanwell, W7 3BP | Background | 514740 | 180643 | $NO_2$ | Y- Ealing | 0.0 | 30.0 | No | 2-2.5 |
| EA4 | 74a Greenford Avenue, Hanwell, W7 3QS | Roadside | 515451 | 180894 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA5 | 6 Boston Gardens, Boston Road, Hanwell, W7 2AN | Roadside | 516301 | 178892 | $NO_2$ | Y- Ealing | 0.0 | 10.0 | No | 2-2.5 |
| EA6 | 200 Uxbridge Road, Hanwell, W7 3TB | Roadside | 515180 | 180111 | $NO_2$ | Y- Ealing | 0.0 | 3.3 | No | 2-2.5 |
| EA7 | 2 St Marys Avenue South, Southall, UB2 4LS | Roadside | 513476 | 178561 | $NO_2$ | Y- Ealing | 0.0 | 12.0 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA8 | 55 King Street, Southall, UB2 4DQ | Roadside | 512341 | 179186 | $NO_2$ | Y- Ealing | 0.0 | 3.3 | No | 2-2.5 |
| EA9 | 18 Western Road, Southall, UB2 5DU | Roadside | 512181 | 179219 | $NO_2$ | Y- Ealing | 0.0 | 7.5 | No | 2-2.5 |
| EA10 | 150 Brent Road, Southall, UB2 5LD | Roadside | 511196 | 179222 | $NO_2$ | Y- Ealing | 7.2 | 0.5 | No | 2-2.5 |
| EA11 | 2 Merrick Road, Southall, UB2 4AU | Roadside | 512657 | 179712 | $NO_2$ | Y- Ealing | 0.0 | 12.0 | No | 2-2.5 |
| EA12 | Hambrough Primary School | Roadside | 512673 | 180069 | $NO_2$ | Y- Ealing | 0.0 | 10.0 | No | 2-2.5 |
| EA13 | 11 The Broadway, Southall, UB1 3PX | Roadside | 512768 | 180400 | $NO_2$ | Y- Ealing | 0.0 | 4.0 | No | 2-2.5 |
| EA14 | 25 Lady Margaret Road, Southall, UB1 2RA | Roadside | 512812 | 180516 | $NO_2$ | Y- Ealing | 0.0 | 6.3 | No | 2-2.5 |
| EA15 | 213 Church Road, Northolt, UB5 5BE | Roadside | 512442 | 183769 | $NO_2$ | Y- Ealing | 0.0 | 12.4 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA16 | 31 Mandeville Road, Northolt, UB5 5HF | Roadside | 513056 | 184241 | $NO_2$ | Y- Ealing | 0.0 | 9.0 | No | 2-2.5 |
| EA17 | 126 Petts Hill, Northolt, UB5 4NW | Roadside | 513794 | 185348 | $NO_2$ | Y- Ealing | 0.0 | 9.0 | No | 2-2.5 |
| EA18 | 1504 Greenford Road, Greenford, UB6 0HR | Roadside | 515402 | 185313 | $NO_2$ | Y- Ealing | 0.0 | 5.3 | No | 2-2.5 |
| EA19 | 914 Greenford Road, Greenford, UB6 8QN | Roadside | 514985 | 183770 | $NO_2$ | Y- Ealing | 0.0 | 3.3 | No | 2-2.5 |
| EA20 | 6 Karoline Gardens, Greenford, UB6 9JP | Roadside | 514691 | 183269 | $NO_2$ | Y- Ealing | 0.0 | 9.1 | No | 2-2.5 |
| EA21 | 12 Blenheim Close, Greenford, UB6 8ET | Roadside | 514862 | 183137 | $NO_2$ | Y- Ealing | 8.0 | 1.5 | No | 2-2.5 |
| EA22 | 19 Runnymede Gardens, Greenford, UB6 8SX | Roadside | 515242 | 183095 | $NO_2$ | Y- Ealing | 8.0 | 1.2 | No | 2-2.5 |
| EA23 | 158 South Ealing Road, Ealing, W5 4QL | Roadside | 517694 | 179045 | $NO_2$ | Y- Ealing | 0.0 | 3.5 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) [1] | Distance to kerb of nearest road (m) [2] | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA24 | 213 Northfields Ave, West Ealing, W13 9QU | Roadside | 517045 | 179292 | $NO_2$ | Y- Ealing | 0.0 | 5.2 | No | 2-2.5 |
| EA25 | 12 Bond Street, Ealing, W5 5AP | Roadside | 517644 | 180613 | $NO_2$ | Y- Ealing | 0.0 | 2.7 | No | 2-2.5 |
| EA26 | 8 Spring Bridge Road, Ealing, W5 2AA | Roadside | 517745 | 180826 | $NO_2$ | Y- Ealing | 0.0 | 3.0 | No | 2-2.5 |
| EA27 | 21 Haven Lane, Ealing, W5 2HZ | Roadside | 518022 | 181114 | $NO_2$ | Y- Ealing | 0.0 | 2.4 | No | 2-2.5 |
| EA28 | 41-42 Haven Green, Ealing, W5 2NX | Roadside | 517909 | 180971 | $NO_2$ | Y- Ealing | 0.0 | 3.0 | No | 2-2.5 |
| EA29 | 64 Hanger Lane, Ealing, W5 2JH | Roadside | 518635 | 181288 | $NO_2$ | Y- Ealing | 0.0 | 0.7 | No | 2-2.5 |
| EA30, EA31, EA32 | Fernlea House | Roadside | 518541 | 182707 | $NO_2$ | Y- Ealing | 0.0 | 4.0 | Yes | 2-2.5 |
| EA33 | 25 Waverley Gardens, Park Royal, NW10 7EX | Roadside | 518673 | 182982 | $NO_2$ | Y- Ealing | 0.0 | 1.8 | No | 2-2.5 |
| EA34 | 3 Iveagh Terrace, Park Royal, NW10 7SY | Roadside | 519126 | 183383 | $NO_2$ | Y- Ealing | 0.0 | 33.0 | No | 2-2.5 |
| EA35 | 5 Wendover Court, Western | Roadside | 520020 | 182180 | $NO_2$ | Y- Ealing | 0.0 | 11.0 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| | Avenue, Acton, W3 0TG | | | | | | | | | |
| EA36, EA37, EA38 | 322 & 324 Western Avenue | Roadside | 520430 | 181950 | $NO_2$ | Y- Ealing | 3.5 | 5.0 | Yes | 2-2.5 |
| EA39 | 326 Western Avenue, Acton, W3 0PL | Roadside | 520426 | 181958 | $NO_2$ | Y- Ealing | 3.5 | 11.4 | No | 2-2.5 |
| EA40 | 94 North Acton Road, Park Royal, NW10 7AY | Roadside | 520780 | 182775 | $NO_2$ | Y- Ealing | 3.5 | 6.0 | No | 2-2.5 |
| EA41 | 1 Shaftesbury Gardens, Park Royal, NW10 6LJ | Roadside | 521312 | 182366 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA42 | 39 Old Oak Lane, Park Royal, NW10 6EJ | Roadside | 521587 | 182685 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA43 | 161 Wells House Road, Park Royal, NW10 6EA | Roadside | 521303 | 182056 | $NO_2$ | Y- Ealing | 6.5 | 3.0 | No | 2-2.5 |
| EA44 | 4 St Andrews Road, Acton, W3 7NE | Roadside | 521389 | 180953 | $NO_2$ | Y- Ealing | 0.0 | 8.6 | No | 2-2.5 |
| EA45 | 98 Western Avenue, Acton, W3 7TZ | Roadside | 521173 | 180981 | $NO_2$ | Y- Ealing | 0.0 | 10.0 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA46 | 6 Western Avenue, Acton, W3 7UD | Roadside | 521549 | 180923 | $NO_2$ | Y- Ealing | 0.0 | 4.6 | No | 2-2.5 |
| EA47 | 71 Old Oak Common Lane, Acton, W3 7DD | Roadside | 521557 | 180996 | $NO_2$ | Y- Ealing | 0.0 | 11.0 | No | 2-2.5 |
| EA48 | 205 Old Oak Road, Acton, W3 7HH | Roadside | 521614 | 180852 | $NO_2$ | Y- Ealing | 0.0 | 4.7 | No | 2-2.5 |
| EA49 | 17 The Vale, Acton, W3 7SH | Roadside | 521720 | 180084 | $NO_2$ | Y- Ealing | 0.0 | 19.4 | No | 2-2.5 |
| EA50 | 3 Warple Way, Acton, W3 0RH | Roadside | 521088 | 180046 | $NO_2$ | Y- Ealing | 0.0 | 2.2 | No | 2-2.5 |
| EA51 | 88 High Street, Acton, W3 6QX | Roadside | 520285 | 180075 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA52 | 15a Church Road, Acton, W3 8QE | Roadside | 520092 | 180063 | $NO_2$ | Y- Ealing | 0.0 | 10.0 | No | 2-2.5 |
| EA53 | 182 High Street, Acton, W3 9NN | Roadside | 520044 | 180125 | $NO_2$ | Y- Ealing | 1.5 | 0.5 | No | 2-2.5 |
| EA54 | 44 Acton Lane, Chiswick, W4 5ED | Roadside | 520484 | 178847 | $NO_2$ | Y- Ealing | 10.0 | 5.0 | No | 2-2.5 |
| EA55 | 156 Horn Lane, Acton, W3 6PH | Roadside | 520180 | 180896 | $NO_2$ | Y- Ealing | 0.0 | 6.0 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) [1] | Distance to kerb of nearest road (m) [2] | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA56, EA57, EA58 | 317 Horn Lane, Acton,W3 0BU (AQMS) (Tri) | Roadside | 520432 | 181428 | $NO_2$ | Y- Ealing | 10.0 | 5.0 | Yes | 2-2.5 |
| EA59 | 5 Leamington Park, Acton, W3 6TJ | Roadside | 520532 | 181517 | $NO_2$ | Y- Ealing | 0.0 | 3.0 | No | 2-2.5 |
| EA60 | Lyra Court, Portal Way, Acton, W3 6DB | Roadside | 520739 | 181824 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA61 | 36 Wales Farm Road, Acton, W3 6UE | Roadside | 520713 | 181592 | $NO_2$ | Y- Ealing | 0.0 | 5.0 | No | 2-2.5 |
| EA62 | 30 Bengarth Road, Northolt, UB5 5LH | Roadside | 512026 | 183762 | $NO_2$ | Y- Ealing | 10.0 | 4.0 | No | 2-2.5 |
| EA63 | Greenway Gardens, Greenford, UB6 9TT | Roadside | 513483 | 182686 | $NO_2$ | Y- Ealing | 16.0 | 0.0 | No | 2-2.5 |
| EA64 | Greenford Business Centre,Greenford, UB6 9AP | Roadside | 514378 | 182112 | $NO_2$ | Y- Ealing | 12.0 | 0.0 | No | 2-2.5 |
| EA65 | 31 Kennedy Road, Hanwell, W7 1JL | Roadside | 515276 | 181990 | $NO_2$ | Y- Ealing | 8.0 | 0.0 | No | 2-2.5 |

| Diffusion Tube ID | Site Name | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|---|---|---|---|---|---|---|---|---|---|---|
| EA66 | 69 Oldfield Lane South, Greenford, UB6 9JT | Roadside | 514521 | 182949 | $NO_2$ | Y- Ealing | 7.0 | 0.0 | No | 2-2.5 |

**Notes:**

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

## 1.2 Comparison of Monitoring Results with AQOs

The annual mean $NO_2$ concentration results from automatic monitoring stations since 2017 are presented in Table D. The results presented are after adjustments for “annualisation” and for distance to a location of relevant public exposure (if required), the details of which are described in Appendix A Details of Monitoring Site Quality QA/QC.

Data capture was excellent at Hanger Lane Gyratory, Horn Lane and Western Avenue (EA6, EA8, EI1) automatic monitors in 2023, with these three stations achieving data capture rates above 95% for $NO_2$. The Green Quarter monitoring location (EA010) recorded a lower data capture (78.9%) due to the site being decommissioned in November 2023. There was no data available at Acton Vale (EI3) for 2023 due to technical issues with the monitor during the year.

There was one exceedance of the $NO_2$ annual mean objective of 40 µg $m^{-3}$ observed at EA6 (Hanger Lane). The Hanger Lane Gyratory monitoring station recorded an $NO_2$ concentration marginally above the objective (40.5 µg $m^{-3}$). However, this is still a significant reduction when compared to 2022 (51.5 µg $m^{-3}$), which continues the downward trend observed at this location. Both Horn Lane and Western Avenue recorded $NO_2$ concentrations below the objective for the fourth year in a row. The annual mean $NO_2$ concentration was 21.0 ug $m^{-3}$ at Green Quarter monitoring station. However, it should be noted that all the automatic monitoring locations were in exceedance of the annual mean WHO AQG of 10 µg $m^{-3}$. None of the automatic sites exceeded the 1 hour mean $NO_2$ objective (200 µg $m^{-3}$ not to be exceeded more than 18 times a year) in 2023 shown in Table F.

Concentration values are those at the location of the monitoring site (bias adjusted and annualised, as required), not those following any fall-off with distance correction.

**Table D. Annual Mean $NO_2$ Monitoring Results: Automatic Monitoring (µg $m^{-3}$)**

| Site ID | Site type | Valid data capture for monitoring period %[(a)] | Valid data capture 2023 %[(b)] | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|
| EA6 Hanger Lane Gyratory | Automatic | 99.2 | 99.2 | **72.3** | **67.9** | **64.5** | **51.0** | **49.4** | **51.5** | **40.5** |
| EA8 Horn Lane | Automatic | 99.3 | 99.3 | **44.2** | **43.9** | **41.8** | 33.2 | 32.0 | 29.3 | 28.5 |
| EI1 Western Avenue | Automatic | 97.7 | 97.7 | **51.2** | **47.7** | **48.6** | 35.2 | 35.9 | 35.2 | 30.1 |
| EI3 Acton Vale | Automatic | 0.0 | 0.0 | - | 29.0 | 26.5 | 19.7 | 21.0 | 20.6 | - |
| EA010 Ealing Green Quarter | Automatic | 89.0 | 78.9 | - | - | - | - | - | 16.7 | 21.0 |

**Notes:**

The annual mean concentrations are presented as µg $m^{-3}$.

Exceedances of the $NO_2$ annual mean AQO of 40 µg $m^{-3}$ are shown in **bold**.

$NO_2$ annual means in excess of 60 µg $m^{-3}$, indicating a potential exceedance of the $NO_2$ hourly mean AQS objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

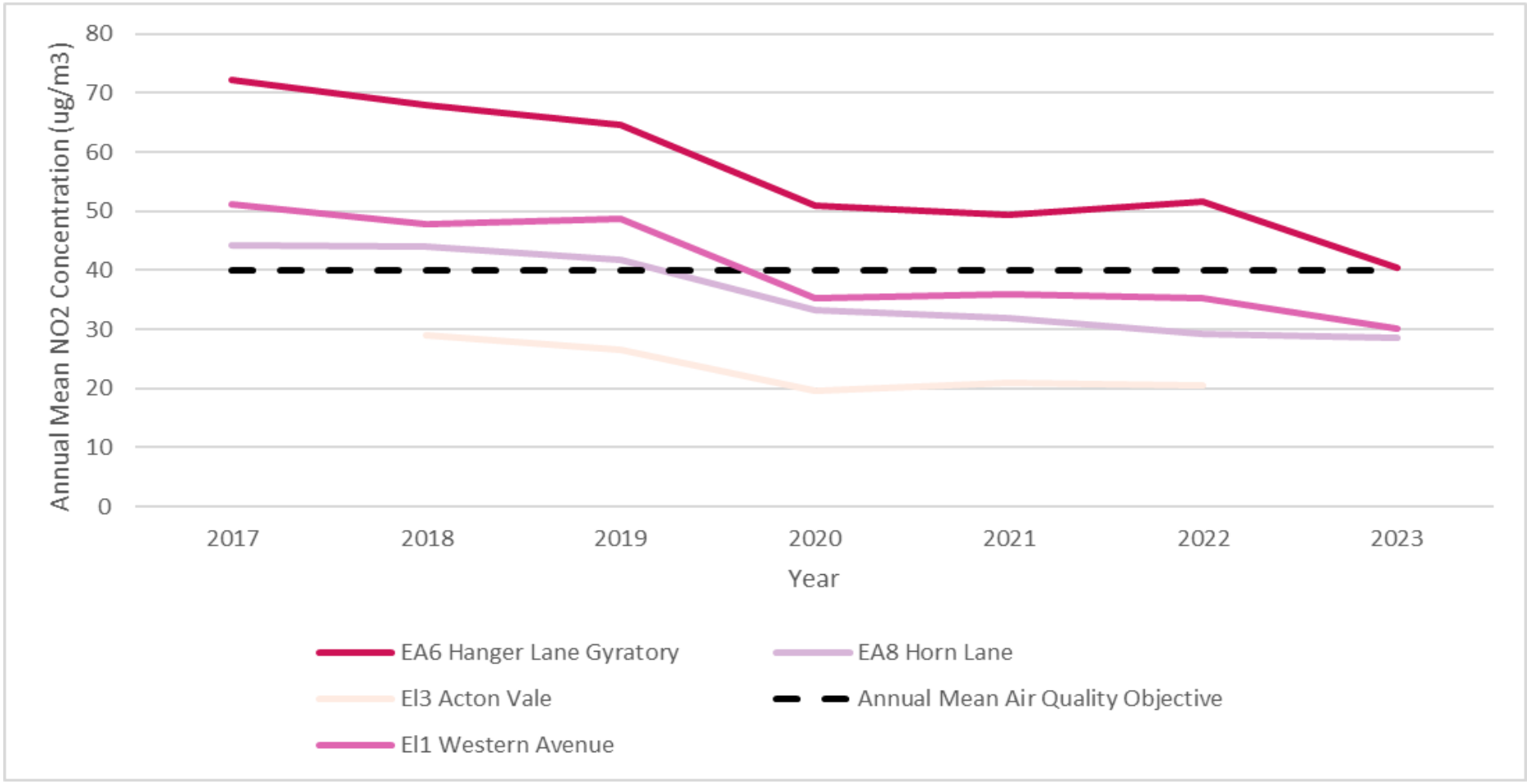
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(b) Data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

Figure 1 shows the trends in $NO_2$ concentrations at automatic monitoring sites in the borough for the period of 2017 – 2023. At automatic monitoring sites, a decreasing trend in $NO_2$ concentrations can be seen since 2015, albeit with some natural variations. There was a large reduction in 2020 due to the impacts of COVID-19 travel restrictions. Between 2020 and 2022, the trend has generally stabilised. All sites displayed decreases in 2023 on 2022 concentrations where data is available.

**Figure 1. Annual Mean $NO_2$ Concentrations at Automatic Monitoring Sites**



Data capture at most $NO_2$ diffusion tubes sites was good in 2023, with at least 9 months of valid data (i.e. 75% data capture or greater). EA8, EA62 and EA64 were the only diffusion tube locations with poor data capture, with a data capture of 65.4%, 73.1% and 65.4% respectively.

The annual mean $NO_2$ concentration results from diffusion tube monitoring locations since 2017 are presented in Table D. The results presented are after adjustments for “annualisation” but not for distance to a location of relevant public exposure (if required), the details of which are described in Appendix A.

Amongst the diffusion tubes, there were three exceedances of the $NO_2$ annual mean objective in 2023, at sites EA30-32, EA46 and EA53. This is similar to 2022 where there were also three exceedances, albeit at slightly different monitoring sites. EA30-32 is co-located with the automatic monitor on the Hanger Lane Gyratory. EA46 is located on the A40 Western Avenue, a major A road through Ealing. EA53 is located along Acton High Street.

The maximum $NO_2$ concentration recorded at diffusion tube sites in 2022 was 52.9 µg $m^{-3}$ at site EA53 along Acton High Street. This location was relocated slightly in January 2023 and is now located closer to the road on opposite side of the road that is closer to relatively longer queues of idling vehicles, which may have contributed to the increase in the annual mean concentration for 2023 compared to the seven-year trend. After distance correction, concentrations at EA53 are reduced but remain above the annual mean $NO_2$ objective (45.3 µg $m^{-3}$). Ealing is investigating the current location and will assess if this location is as appropriate and representative as the original location. Overall, there have been decreases in $NO_2$ concentrations at 53 sites in 2023 compared to 2022. The largest decrease was seen at the EA30-32 triplicate site ( -9.5 µg $m^{-3}$). Other notable decreases include EA26 (-6.9 µg $m^{-3}$) from 43.6 µg $m^{-3}$ to 36.7 µg $m^{-3}$. This is the first time EA26 has been below the $NO_2$ annual mean objective.

As there were no diffusion tube locations which saw annual mean concentrations above 60 µg $m^{-3}$ in 2023, it is unlikely that the 1 hour mean $NO_2$ objective was exceeded at any monitoring location.

**Table E. Annual Mean $NO_2$ Monitoring Results: Non-Automatic Monitoring (µg $m^{-3}$)**

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2023 (%) (2) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA1 | 516368 | 182978 | Roadside | 100.0 | 100.0 | **54** | **49.4** | **50.3** | 36.1 | 34.6 | 33.5 | 29.6 |
| EA2 | 516704 | 180505 | Roadside | 92.3 | 92.3 | **40.1** | **42** | 38.7 | 27.7 | 29.8 | 28.4 | 29.9 |
| EA3 | 514740 | 180643 | Background | 100.0 | 100.0 | 20.2 | 21 | 20.5 | 15.2 | 14.9 | 15.9 | 13.4 |
| EA4 | 515451 | 180894 | Roadside | 92.3 | 92.3 | 32.4 | 30.1 | 34.4 | 24.4 | 25.9 | 25.3 | 23.5 |
| EA5 | 516301 | 178892 | Roadside | 100.0 | 100.0 | 29.7 | 30.7 | 29.8 | 21.2 | 21.1 | 26.2 | 25.2 |
| EA6 | 515180 | 180111 | Roadside | 100.0 | 100.0 | **42.8** | **42.8** | **43** | 33.5 | 33.5 | 35.8 | 30.4 |
| EA7 | 513476 | 178561 | Roadside | 100.0 | 100.0 | 29.4 | 30.5 | 28.9 | 21 | 22 | 20.2 | 19.7 |
| EA8 | 512341 | 179186 | Roadside | 65.4 | 65.4 | **50.6** | **41.1** | **40.5** | 27 | 29.4 | 32.3 | 28.7 |
| EA9 | 512181 | 179219 | Roadside | 100.0 | 100.0 | 31.9 | 30.9 | 31.5 | 22.4 | 22.9 | 23.4 | 21.7 |
| EA10 | 511196 | 179222 | Roadside | 100.0 | 100.0 | 34.6 | 35 | 33.2 | 23.4 | 24.3 | 27.2 | 30.3 |
| EA11 | 512657 | 179712 | Roadside | 100.0 | 100.0 | 28.6 | 28.6 | 27.5 | 17.6 | 20.8 | 19.3 | 20.3 |
| EA12 | 512673 | 180069 | Roadside | 92.3 | 92.3 | 31.4 | 34.4 | 32.5 | 24 | 22.6 | 23 | 22.2 |
| EA13 | 512768 | 180400 | Roadside | 92.3 | 92.3 | **45.1** | **46** | **44.3** | 35.2 | 32.9 | 36.2 | 34.2 |
| EA14 | 512812 | 180516 | Roadside | 100.0 | 100.0 | **44.1** | **40.2** | **41.2** | 29.6 | 31.6 | 32.5 | 29.8 |
| EA15 | 512442 | 183769 | Roadside | 100.0 | 100.0 | 36.2 | 37.2 | 35.2 | 24.3 | 27.3 | 25.2 | 23.8 |
| EA16 | 513056 | 184241 | Roadside | 100.0 | 100.0 | 37.1 | 33.9 | 34.6 | 28.3 | 25.9 | 26.7 | 24.4 |
| EA17 | 513794 | 185348 | Roadside | 100.0 | 100.0 | 33.4 | 33.4 | 32.8 | 24.8 | 23.6 | 23.1 | 20.8 |
| EA18 | 515402 | 185313 | Roadside | 100.0 | 100.0 | 31.5 | 31.8 | 31.7 | 24.1 | 25.3 | 24.2 | 19.8 |
| EA19 | 514985 | 183770 | Roadside | 100.0 | 100.0 | 34.7 | 35 | 34.3 | 24.4 | 26.7 | 25.2 | 23.9 |
| EA20 | 514691 | 183269 | Roadside | 100.0 | 100.0 | **41** | **41.6** | 39.1 | 28.7 | 27.9 | 27.8 | 23.1 |
| EA21 | 514862 | 183137 | Roadside | 100.0 | 100.0 | 34.2 | 34.4 | 30 | 20.2 | 22.6 | 20.7 | 20.2 |
| EA22 | 515242 | 183095 | Roadside | 100.0 | 100.0 | 37.9 | 33.1 | 33.1 | 24.6 | 23.5 | 22.3 | 21.2 |
| EA23 | 517694 | 179045 | Roadside | 92.3 | 92.3 | **53.5** | **50.6** | **52** | 35.2 | 31.4 | 34.1 | 32.1 |
| EA24 | 517045 | 179292 | Roadside | 100.0 | 100.0 | 36.1 | 33.5 | 32.7 | 24.3 | 25.6 | 27.6 | 27.5 |
| EA25 | 517644 | 180613 | Roadside | 100.0 | 100.0 | **44.3** | **52.5** | **42.2** | 30.9 | 30.7 | 31.8 | 26.2 |
| EA26 | 517745 | 180826 | Roadside | 100.0 | 100.0 | **54.4** | **60.4** | **56.2** | **42.5** | **44.3** | **43.6** | 36.7 |
| EA27 | 518022 | 181114 | Roadside | 100.0 | 100.0 | 31.2 | 31.2 | 30.2 | 22.6 | 22.5 | 21.5 | 20.8 |
| EA28 | 517909 | 180971 | Roadside | 100.0 | 100.0 | **39.8** | **42.3** | **42.1** | 33.3 | 36.8 | 37.4 | 30.0 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2023 (%) (2) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA29 | 518635 | 181288 | Roadside | 100.0 | 100.0 | 35.6 | 36.4 | 35.1 | 27.1 | 25.6 | 25.4 | 21.8 |
| EA30, EA31, EA32 | 518541 | 182707 | Roadside | 100.0 | 100.0 | **71.9** | **69.4** | **66.2** | **50.2** | **50.3** | **52** | **42.5** |
| EA33 | 518673 | 182982 | Roadside | 100.0 | 100.0 | **43.3** | **54.5** | **56** | **44.5** | **40.3** | 35.9 | 32.5 |
| EA34 | 519126 | 183383 | Roadside | 100.0 | 100.0 | 34.6 | 35.2 | 33.9 | 28.1 | 25.1 | 29.5 | 33.5 |
| EA35 | 520020 | 182180 | Roadside | 100.0 | 100.0 | **47.3** | **49.7** | **46.6** | 35.7 | 33.7 | 35 | 28.5 |
| EA36, EA37, EA38 | 520430 | 181950 | Roadside | 100.0 | 100.0 | **56** | **54.4** | **49.4** | 36.5 | 35.8 | 35.3 | 32.1 |
| EA39 | 520426 | 181958 | Roadside | 100.0 | 100.0 | **45** | **48.3** | **41.4** | 31.2 | 28.4 | 27.1 | 23.4 |
| EA40 | 520780 | 182775 | Roadside | 76.9 | 76.9 | 33.4 | 33.1 | 30.6 | 22 | 25.9 | 25.1 | 22.9 |
| EA41 | 521312 | 182366 | Roadside | 100.0 | 100.0 | 32.6 | 32.6 | 30 | 25.2 | 24.2 | 23.2 | 24.9 |
| EA42 | 521587 | 182685 | Roadside | 100.0 | 100.0 | **45.3** | **44.4** | **45.9** | 32 | 35.4 | 32.6 | 32.0 |
| EA43 | 521303 | 182056 | Roadside | 100.0 | 100.0 | 36.9 | 36.6 | 33.2 | 24.9 | 24.4 | 25.4 | 22.8 |
| EA44 | 521389 | 180953 | Roadside | 100.0 | 100.0 | 34.7 | 32 | 31.4 | 22.6 | 21 | 21.9 | 19.7 |
| EA45 | 521173 | 180981 | Roadside | 82.7 | 82.7 | **43.9** | **46.7** | **39.6** | 29.3 | 29.4 | 29.7 | 25.9 |
| EA46 | 521549 | 180923 | Roadside | 90.4 | 90.4 | **67.9** | **67.6** | **59.6** | **46.1** | **45.3** | **46** | **40.5** |
| EA47 | 521557 | 180996 | Roadside | 100.0 | 100.0 | **43.7** | **43** | **41.4** | 32.9 | 30.5 | 29 | 26.4 |
| EA48 | 521614 | 180852 | Roadside | 100.0 | 100.0 | **50.9** | **52.6** | **47.1** | 37.8 | 36.4 | **39.7** | 30.8 |
| EA49 | 521720 | 180084 | Roadside | 100.0 | 100.0 | 34.6 | 37.5 | 35.3 | 26.7 | 25.4 | 24.5 | 21.6 |
| EA50 | 521088 | 180046 | Roadside | 100.0 | 100.0 | 32.6 | 36.2 | 34.3 | 25.7 | 24.3 | 23.7 | 22.0 |
| EA51 | 520285 | 180075 | Roadside | 100.0 | 100.0 | **49** | **48.1** | **48.8** | 39 | 39.4 | **39.9** | 37.8 |
| EA52 | 520092 | 180063 | Roadside | 100.0 | 100.0 | 28.6 | 29.6 | 27.5 | 22.5 | 22.2 | 22.6 | 20.2 |
| EA53 | 520044 | 180125 | Roadside | 82.7 | 82.7 | **44.4** | **47.7** | **47.5** | 36.2 | 34.5 | 37.2 | **52.9** |
| EA54 | 520484 | 178847 | Roadside | 92.3 | 92.3 | 37.6 | **44.3** | 39.3 | 28.2 | 28.9 | 28.5 | 24.9 |
| EA55 | 520180 | 180896 | Roadside | 100.0 | 100.0 | 36.5 | **40.5** | 34.9 | 27.6 | 28.2 | 26.8 | 24.1 |
| EA56, EA57, EA58 | 520432 | 181428 | Roadside | 100.0 | 100.0 | **44.1** | **44.3** | **41.2** | 31.3 | 31.1 | 30.2 | 27.7 |

| Diffusion Tube ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type | Valid Data Capture for Monitoring Period (%) (1) | Valid Data Capture 2023 (%) (2) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA59 | 520532 | 181517 | Roadside | 100.0 | 100.0 | 36.4 | 38.4 | 34.1 | 26.6 | 26 | 26.1 | 23.7 |
| EA60 | 520739 | 181824 | Roadside | 100.0 | 100.0 | **40** | 39.2 | **39.8** | 29.7 | 26.5 | 26.1 | 23.6 |
| EA61 | 520713 | 181592 | Background | 100.0 | 100.0 | 38.9 | 37.6 | 37.1 | 28.6 | 26.3 | 26.9 | 28.0 |
| EA62 | 512026 | 183762 | Roadside | 73.1 | 73.1 | - | - | - | - | - | 19.2 | 18.8 |
| EA63 | 513483 | 182686 | Roadside | 100.0 | 100.0 | - | - | - | - | - | 24.4 | 22.0 |
| EA64 | 514378 | 182112 | Roadside | 65.4 | 65.4 | - | - | - | - | - | 37.8 | 33.9 |
| EA65 | 515276 | 181990 | Roadside | 82.7 | 82.7 | - | - | - | - | - | 18.2 | 17.5 |
| EA66 | 514521 | 182949 | Roadside | 100.0 | 100.0 | - | - | - | - | - | 24 | 21.3 |

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LLAQM.TG19.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

**Notes:**

The annual mean concentrations are presented as µg $m^{-3}$.

Exceedances of the $NO_2$ annual mean objective of 40µg $m^{-3}$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg $m^{-3}$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure 2 to Figure 8 show the trends in $NO_2$ concentrations for 2017-2023 at diffusion tube monitoring sites grouped by monitoring site type: urban background and roadside sites. At the urban background diffusion tube site Brent Lodge Park (EA3) (Figure 2), there is evidence of a decrease in $NO_2$ concentrations between 2017 and 2023.

The majority of near-road and roadside sites show an overall decreasing trend in annual mean $NO_2$ concentrations since 2017, with evidence of a stabilisation between 2017 and 2019 and a stabilisation or slight increase from 2020 to 2022. The decrease in 2020 is likely to be the impact of COVID-19 and resulting lockdowns leading to a decrease in road traffic emissions, with subsequent increases likely attributable to a return to business as usual. 2023 generally saw a return to a gradual decreasing trend at most sites, with seven diffusion tube sites showing an increase.

**Figure 2. Annual Mean $NO_2$ Concentrations at the Urban Background Diffusion Tube Site**

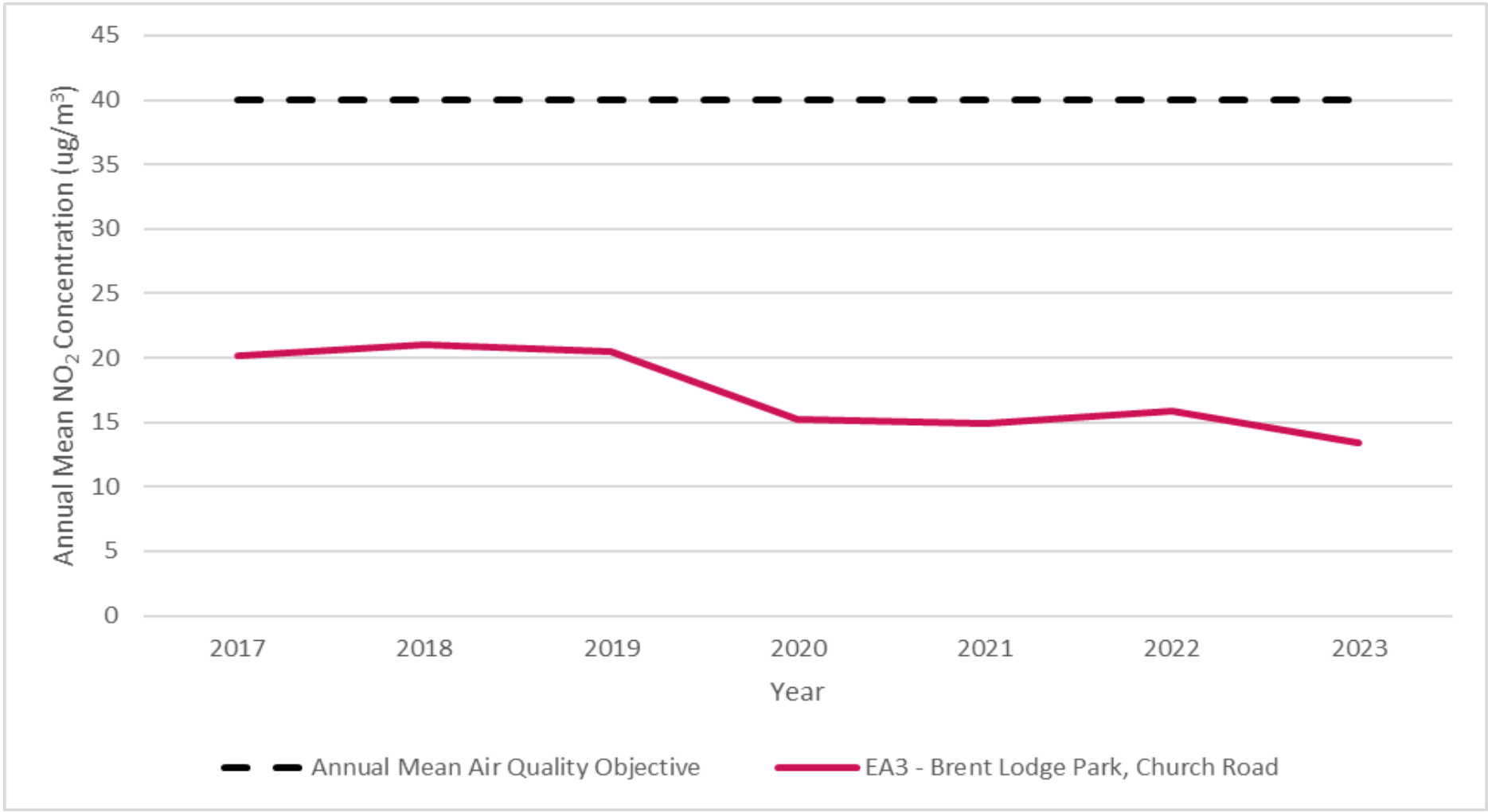


**Figure 3. Annual Mean $NO_2$ Concentrations at Roadside Diffusion Tube Sites (1)**

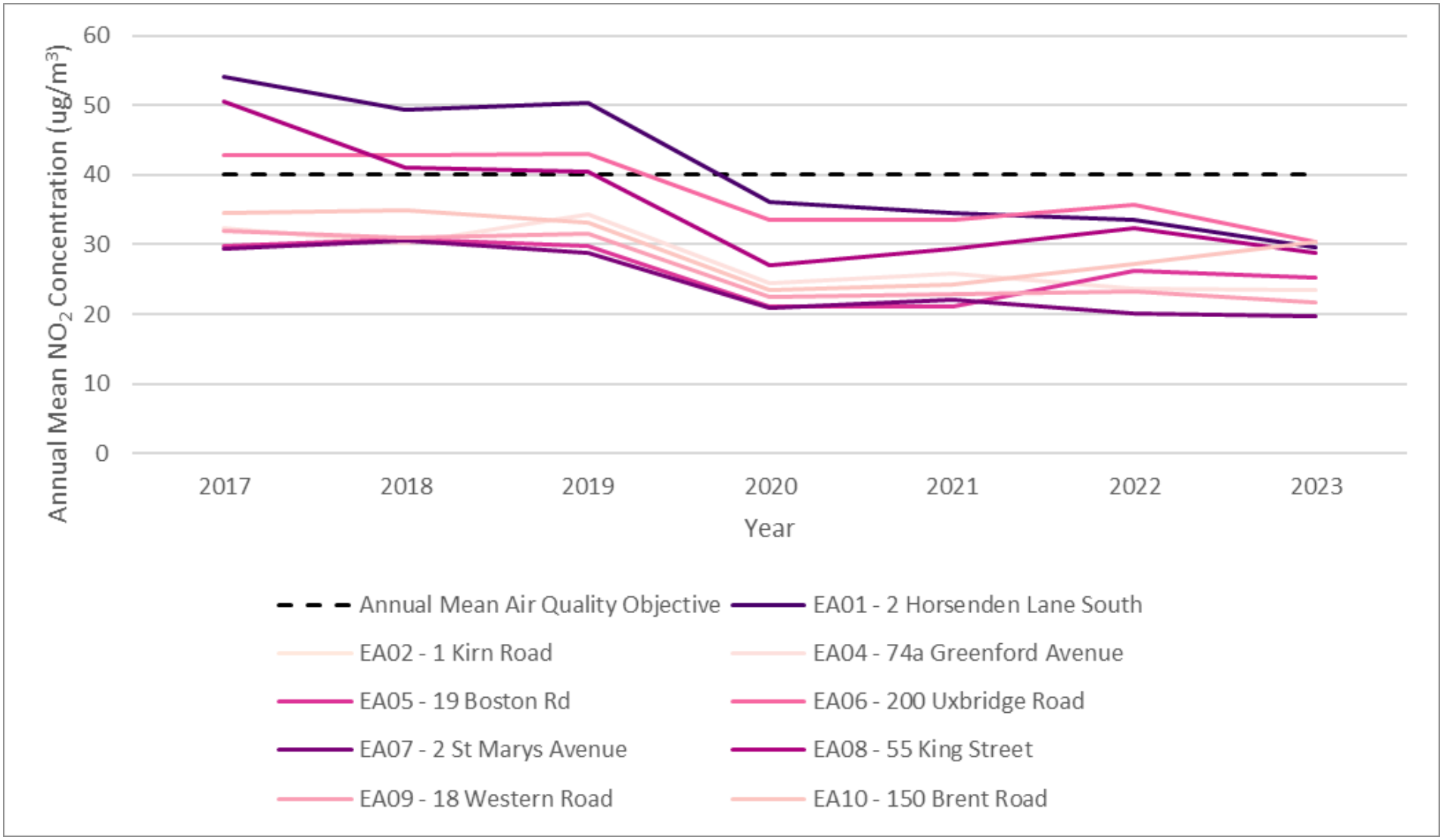


**Figure 4. Annual Mean $NO_2$ Concentrations at Roadside Diffusion Tube Sites (2)**

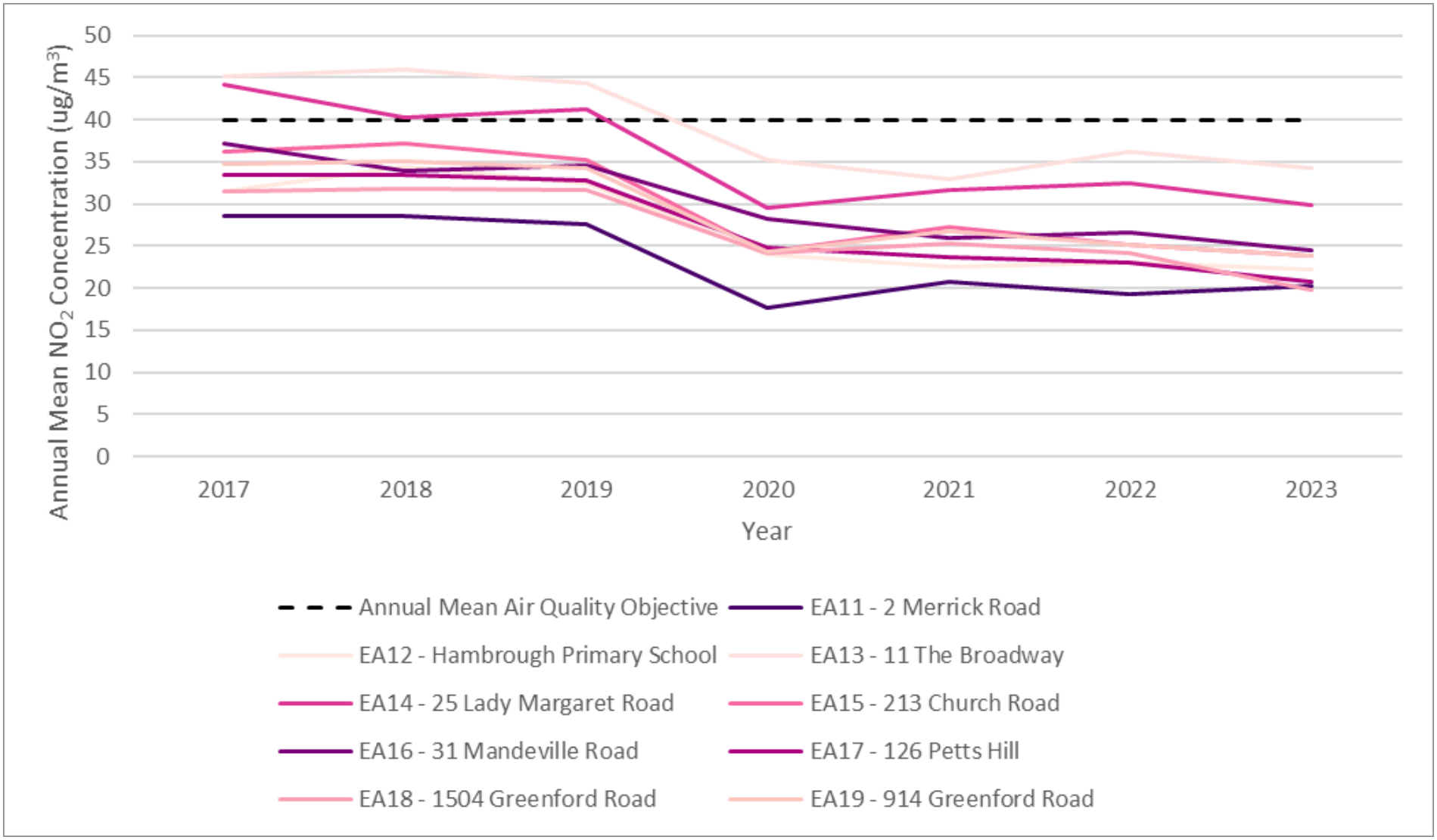


**Figure 5. Annual Mean $NO_2$ Concentrations at Roadside Diffusion Tube Sites (3)**

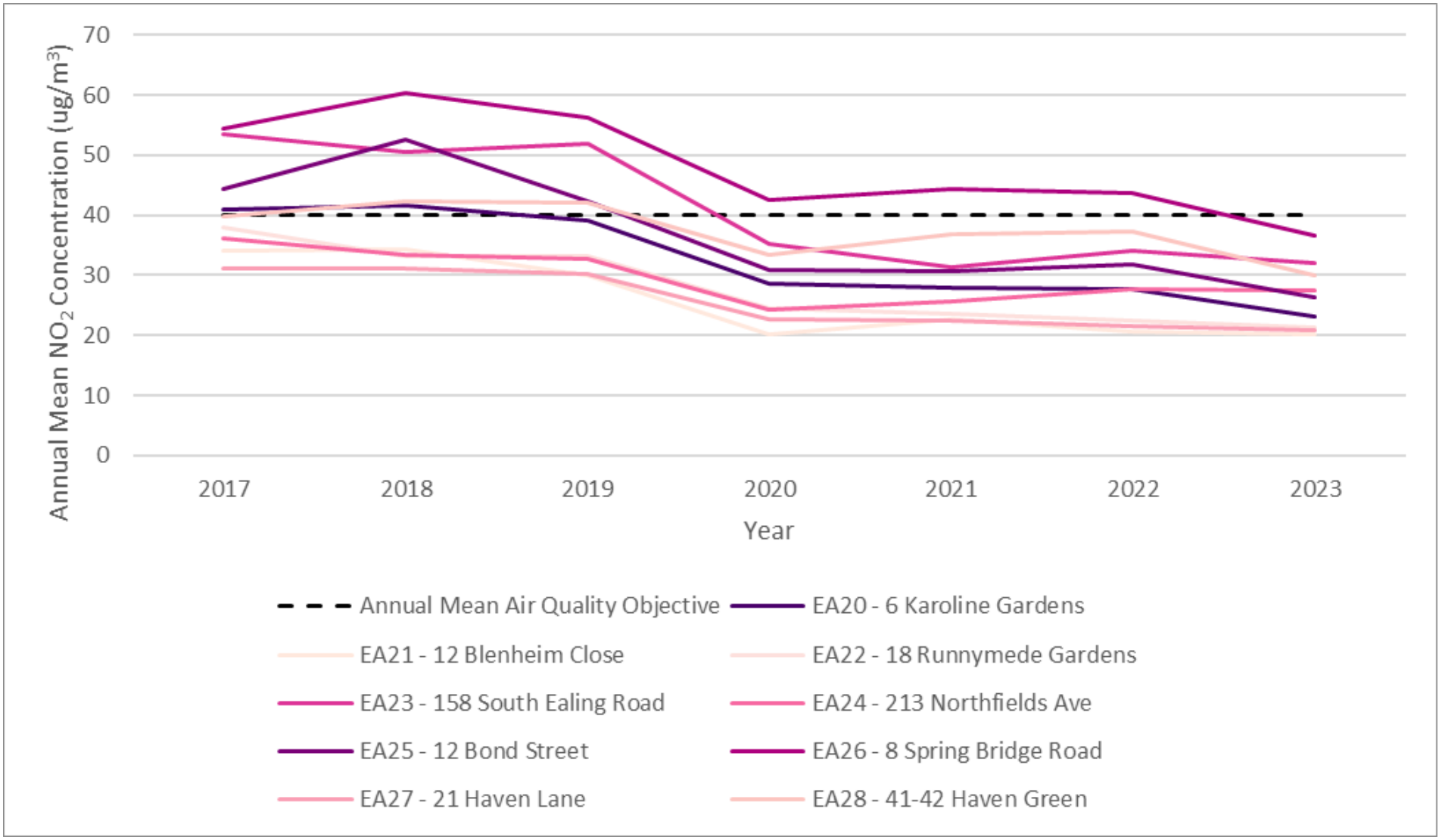


**Figure 6. Annual Mean $NO_2$ Concentrations at Roadside Diffusion Tube Sites (4)**

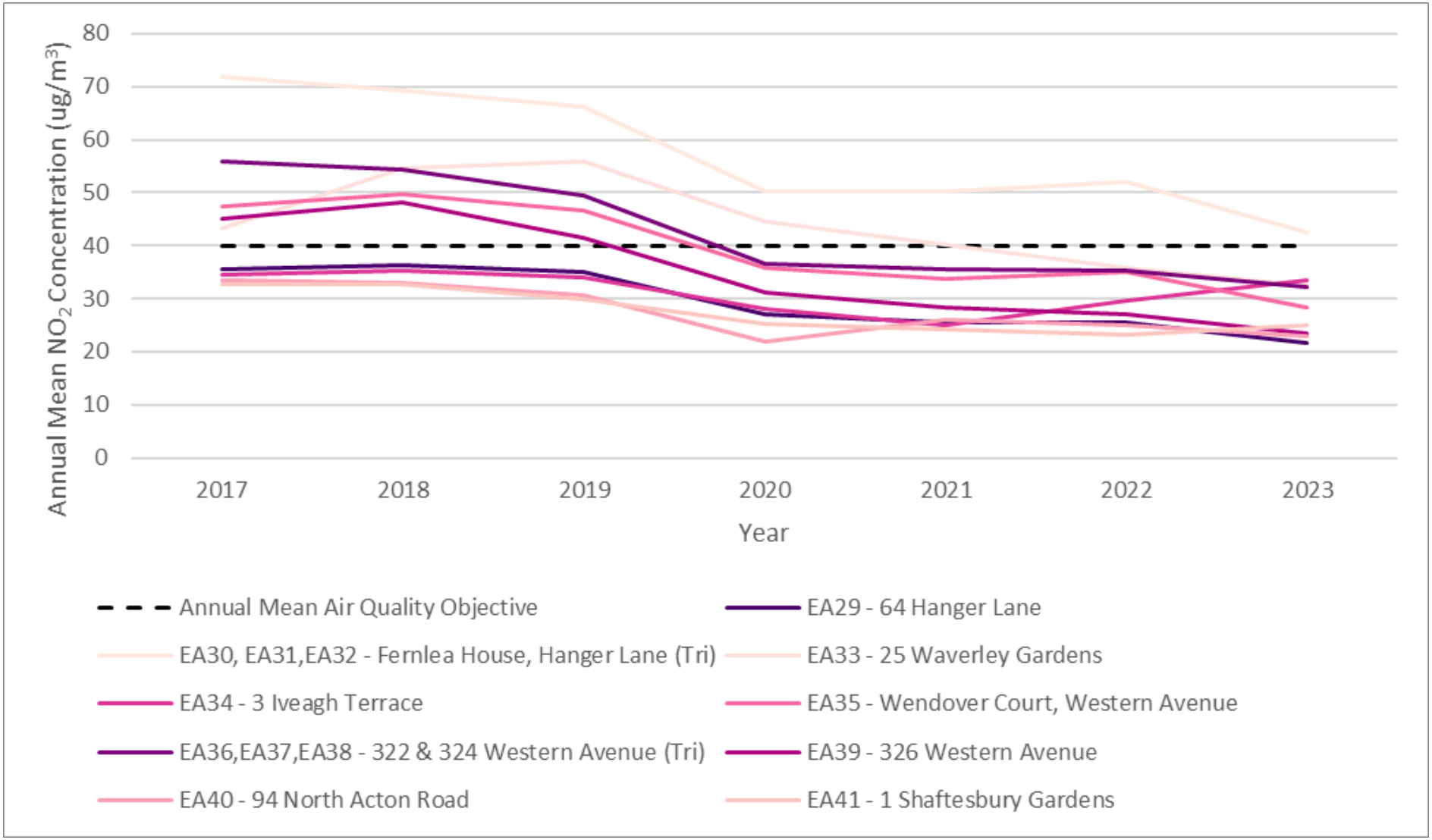


**Figure 7. Annual Mean $NO_2$ Concentrations at Roadside Diffusion Tube Sites (5)**

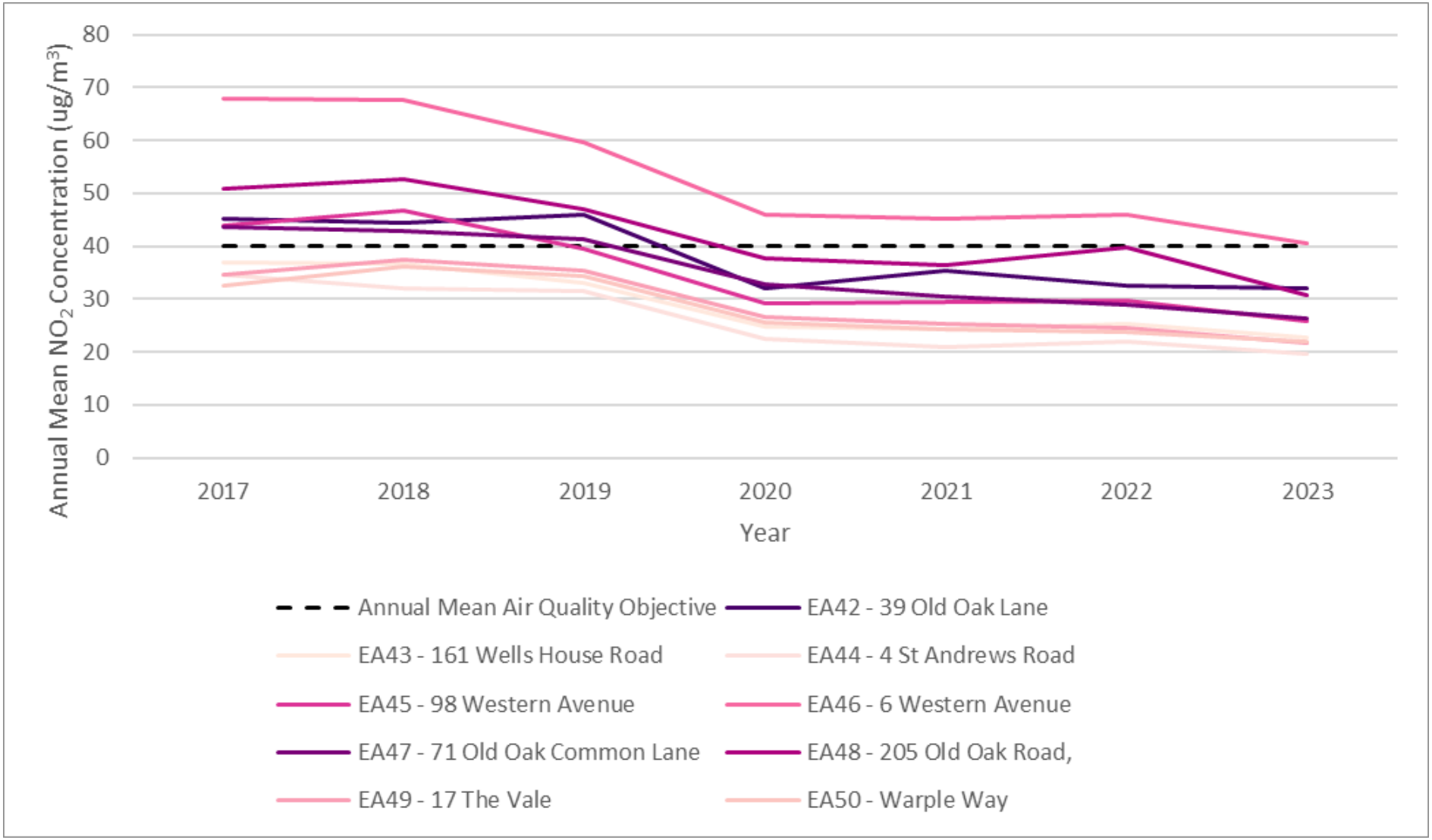


**Figure 8. Annual Mean $NO_2$ Concentrations at Roadside Diffusion Tube Sites (6)**

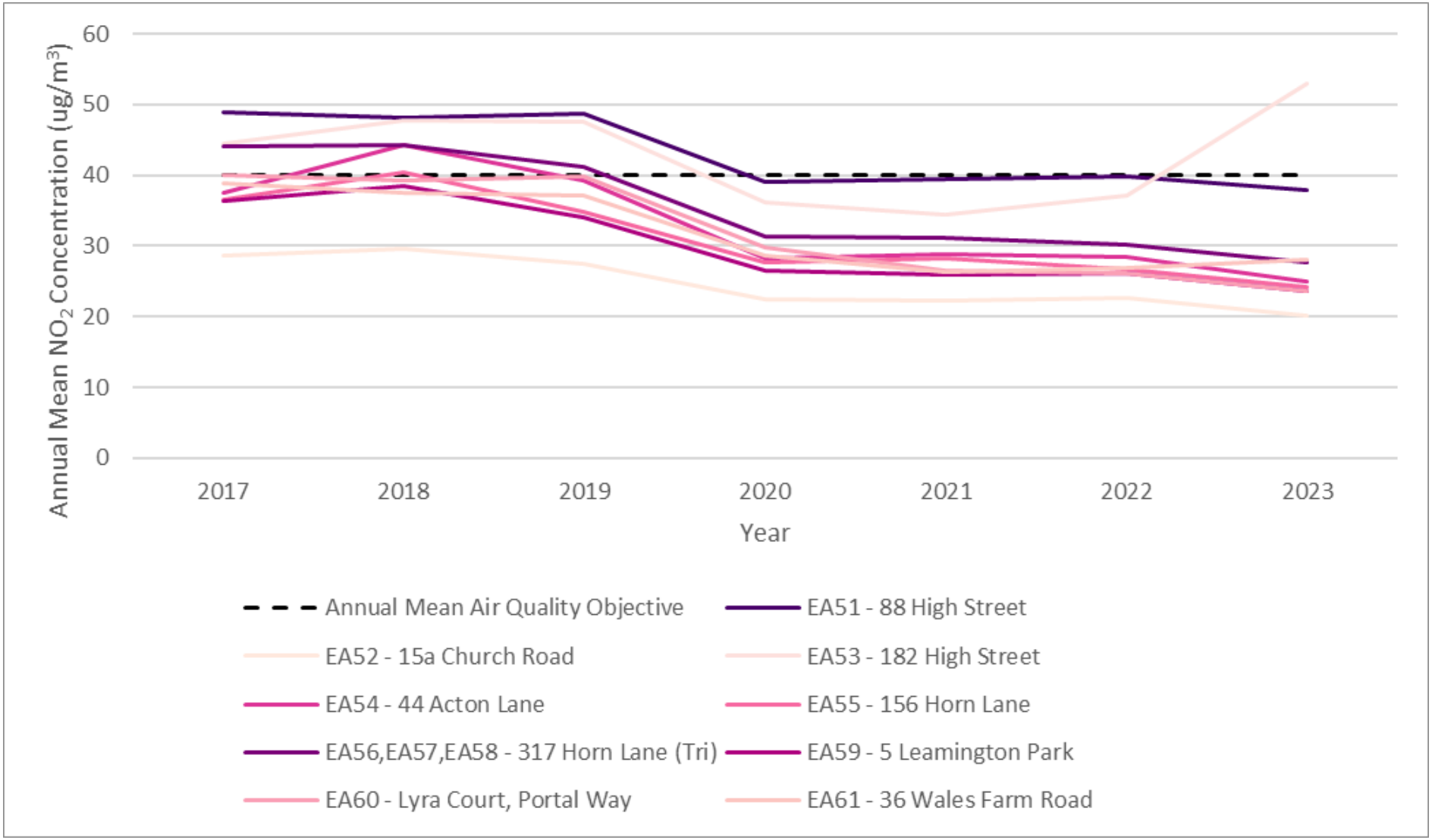


Table F presents the 1-hour mean $NO_2$ monitoring results at automatic monitoring stations between 2017 to 2023. None of the automatic sites exceeded the 1 hour mean $NO_2$ objective (200 µg $m^{-3}$ not to be exceeded more than 18 times a year) in 2023. Whilst there were some hourly mean concentrations over the 200 µg $m^{-3}$ threshold in 2019, all monitoring sites have been compliant with the objective since 2017.

**Table F. $NO_2$ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg $m^{-3}$**

| Site ID | Valid data capture for monitoring period %([a]) | Valid data capture 2023 %([b]) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| EA6 Hanger Lane Gyratory | 99.2 | 99.2 | 9 | 0 | 3 | 0 | 0 | 0 | 0 |
| EA8 Horn Lane | 99.3 | 99.3 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| EI1 Western Avenue | 97.7 | 97.7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| E13 Acton Vale | 0.0 | 0.0 | - | 0 | 0 | 0 (82) | 0 (81) | 0 (102) | - |
| EA010 Ealing Green Quarter | 89.0 | 78.9 | - | - | - | - | - | 0 | 0 (82.7) |

**Notes:**

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg $m^{-3}$ have been recorded.

Exceedance of the $NO_2$ short term AQO of 200 µg $m^{-3}$ over the permitted 18 hours per year are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

(b) Data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

$PM_{10}$ concentrations are currently measured using TEOMs at all automatic monitoring locations in the London Borough of Ealing. The Horn Lane station is equipped with both TEOM and BAM analysers for $PM_{10}$ monitoring and results from these are presented separately. The annual mean $PM_{10}$ results are shown in Table G and the 24-hour mean $PM_{10}$ results are presented in Table H.

Data capture in 2023 was good (i.e. >85%) at EA6 Hanger Lane, EA8 Horn Lane, EI8 Horn Lane TEOM, and EI1 Western Avenue. There was slightly lower data capture at EA010 Green Quarter (84.2%) due to the site being decommissioned in November 2023. There was no data available for EI3 Acton Vale due to technical issues with the monitor, where Ealing sought to resolve with owner (Thames Tideway). The annual mean $PM_{10}$ objective of 40 µg $m^{-3}$ was achieved at all sites during 2023 (where valid data is available), and it has been achieved at all automatic monitoring locations in the borough since 2017. However, it should be noted that all the automatic monitoring locations were in exceedance of WHO AQG for annual mean $PM_{10}$ (15 µg $m^{-3}$). The highest annual mean $PM_{10}$ concentration in 2023 was recorded at EA8 Horn Lane (28.5 µg $m^{-3}$).

The number of exceedances of the 24-hour mean objective (50 µg $m^{-3}$) was within the permitted 35 days per year at all monitoring locations.

Figure 9 shows the trends in $PM_{10}$ concentrations at automatic monitoring sites in the borough for the period of 2017 – 2023. The figure indicates a slight downward trend in annual values at Hanger Lane since 2015, whilst other monitoring locations do not show a strong discernible trend.

**Table G. Annual Mean $PM_{10}$ Automatic Monitoring Results (µg $m^{-3}$)**

| Site ID | Valid data capture for monitoring period %(a) | Valid data capture 2023 %(b) | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| EA6 Hanger Lane Gyratory | 94.0 | 94.0 | 26 | 28 | 25 | 23 | 20 | 18 | 17.6 |
| EA8 Horn Lane | 95.2 | 95.2 | 27 | 25 | 28 | 24 | 26 | 27 | 28.5 |
| EI8 Horn Lane TEOM | 90.2 | 90.2 | 26 | 26 | 25 | 21 | 23 | 27 | 23.8 |
| EI1 Western Avenue | 97.1 | 97.1 | 26 | 28 | 26 | 23 | 25 | 25 | 21.3 |
| EI3 Acton Vale | 0.0 | 0.0 | - | 19 | 18 | 16 | 16 | 17 | - |
| EA010 Green Quarter | 95.0 | 84.2 | - | - | - | - | - | 16.4 | 18.3 |

**Notes:**

The annual mean concentrations are presented as µg $m^{-3}$.

Exceedances of the $PM_{10}$ annual mean AQO of 40 µg $m^{-3}$ are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 25%.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(b) Data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

**Table H. $PM_{10}$ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of $PM_{10}$ 24-Hour Means > 50 µg $m^{-3}$**

| Site ID | Valid data capture for monitoring period %[(a)] | Valid data capture 2023 %[(b)] | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| EA6 Hanger Lane Gyratory | 94.0 | 94.0 | 10 | 12 | 13 | 7 | 4 | 3 (30) | 9 |
| EA8 Horn Lane | 95.3 | 95.3 | 16 | 7 | 15 | 9 | 13 | **13 (52)** | 27 |
| EI8 Horn Lane TEOM | 90.2 | 90.2 | 10 | 7 | 16 | 5 | 9 | 18 | 15 |
| EI1 Western Avenue | 97.1 | 97.1 | 9 | 14 | 21 | 11 | 11 | 14 (41) | 10 |
| EI3 Acton Vale | 0.0 | 0.0 | - | 2 | 9 | 3 (30) | 1 | 4 (36) | - |
| EA010 Green Quarter | 95.0 | 84.2 | - | - | - | - | - | 6 | 3 (34.9) |

**Notes:**

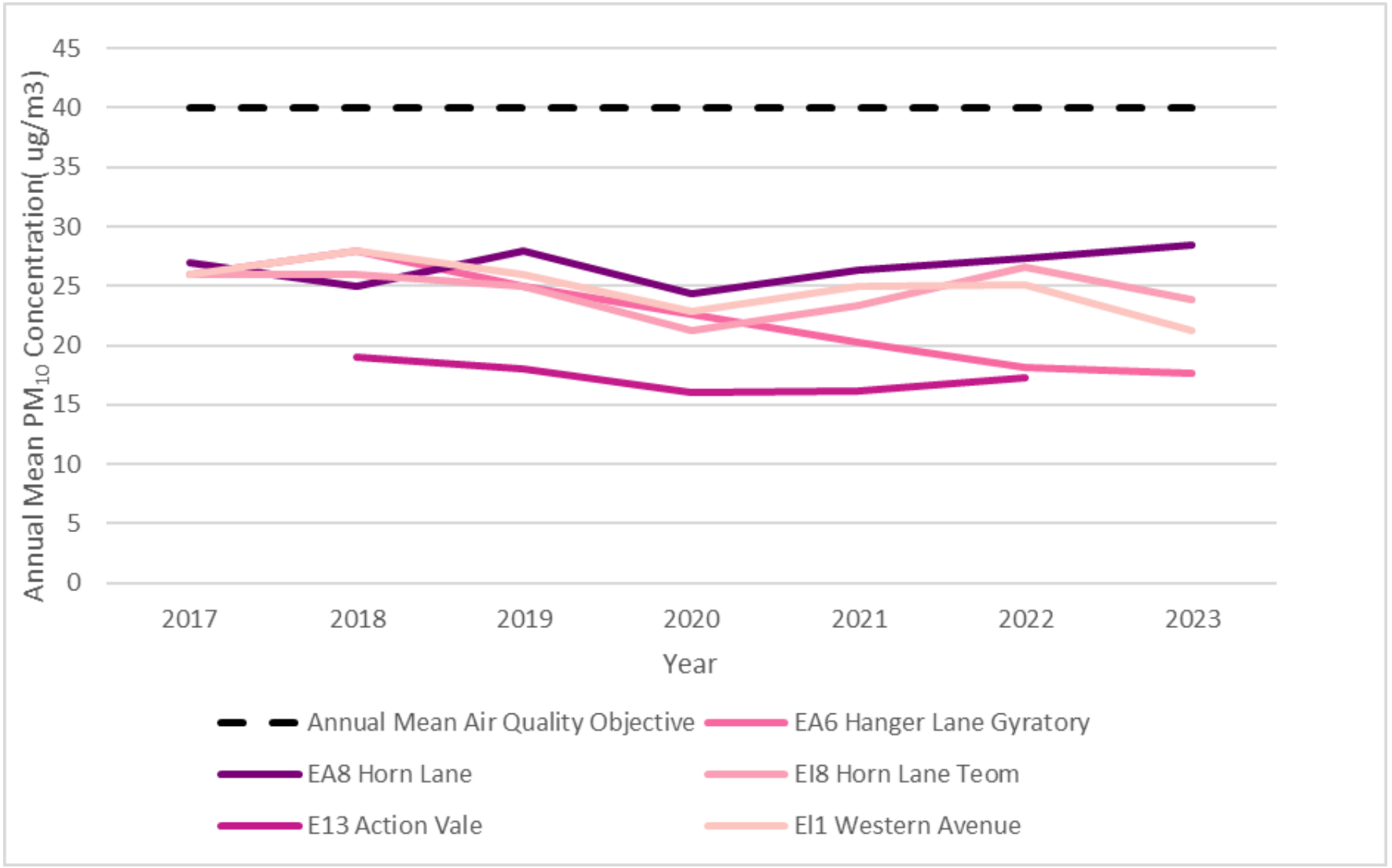
Exceedances of the $PM_{10}$ 24-hour mean objective (50 µg $m^{-3}$ over the permitted 35 days per year) are shown in **bold.**

Where the period of valid data is less than 85% of a full year, the 90.4th percentile is provided in brackets.

(a) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

(b) data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

**Figure 9 Annual Mean $PM_{10}$ Concentrations at Automatic Monitoring Sites**



$PM_{2.5}$ concentrations began to be monitored at EA010 Green Quarter automatic monitoring station in 2023, where the annual mean concentration of 8.5 µg $m^{-3}$ was well below the annual mean $PM_{2.5}$ AQO value of 20 µg $m^{-3}$ and in compliance with the London Mayoral Objective. However, it is above the annual mean WHO AQG for $PM_{2.5}$ of 5 µg $m^{-3}$.

**Table I. Annual Mean $PM_{2.5}$ Automatic Monitoring Results (µg $m^{-3}$)**

| Site ID | Valid data capture for monitoring period %[(a)] | Valid data capture 2023 %[(b)] | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 |
|---|---|---|---|---|---|---|---|---|---|
| EA010 Green Quarter | 95.0 | 84.2 | - | - | - | - | - | 9.0 | 8.5 |

**Notes:**

The annual mean concentrations are presented as µg $m^{-3}$.

Exceedances of the $PM_{2.5}$ annual mean AQO of 20 µg $m^{-3}$ are shown in **bold**.

All means have been "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 25%.

(a) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(b) Data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

# 2. Action to Improve Air Quality

## 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 12 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

A summary of AQMAs declared by London Borough of Ealing can be found in Table J. The table presents a description of the AQMA that is currently designated within London Borough of Ealing. Appendix C provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation are as follows:

- $NO_2$ annual mean
- $PM_{10}$ 24-hour mean

**Table J. Declared Air Quality Management Areas**

| AQMA Name | Date of Declaration | Pollutants and Air Quality Objectives | One Line Description | Is air quality in the AQMA influenced by roads controlled by Highways England? | Level of Exceedance: Declaration | Level of Exceedance: Current Year | Number of Years Compliant with Air Quality Objective | Name and Date of AQAP Publication | Web Link to AQAP |
|---|---|---|---|---|---|---|---|---|---|
| Ealing AQMA | Declared 14/12/2000 | $NO_2$ Annual Mean | Borough Wide AQMA | YES | **53 µg/m$^3$** ($NO_2$ annual mean) at Ealing 2 and Ealing 5. | **45.3 µg/m$^3$ ($NO_2$ annual mean)** | Not compliant for $NO_2$ annual mean objective | Air Quality Action Plan 2022-2027 published in Dec 2023 | Air Quality Action Plan 2022-27 \| Ealing Council |

| AQMA Name | Date of Declaration | Pollutants and Air Quality Objectives | One Line Description | Is air quality in the AQMA influenced by roads controlled by Highways England? | Level of Exceedance: Declaration | Level of Exceedance: Current Year | Number of Years Compliant with Air Quality Objective | Name and Date of AQAP Publication | Web Link to AQAP |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | **42 µg/m$^3$** ($NO_2$ annual mean) at Ealing 1. [2] | | | | |
| Ealing AQMA | Declared 14/12/2000 | $PM_{10}$ 24-hour mean | Borough Wide AQMA | YES | Compliant at the time of declaration. Ealing 2: 19 days over daily average of >50µgm$^{-3}$ Ealing 5: 16 days over daily average of >50µgm$^{-3}$ This is within the permitted 35 days per year. [2] | A maximum of 27 daily exceedances of the 24 - hour objective ($PM_{10}$ 24 hour mean). This is within the permitted 35 days per year. | Compliant for $PM_{10}$ 24 hour mean objective | Air Quality Action Plan 2022-2027 published in Dec 2023 | Air Quality Action Plan 2022-27 \| Ealing Council |

☒ **London Borough of Ealing confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **London Borough of Ealing confirm that all current AQAPs have been submitted to GLA.**

## 2.2 Air Quality Action Plan Progress

[2] King's College London (2000). Air Quality in London 2000. Available at: Microsoft Word - an_report_2000_v3.DOC (londonair.org.uk)

Table K provides a brief summary of London Borough of Ealing progress against the Air Quality Action Plan[3], showing progress made this year. New projects which commenced in 2023 are shown at the bottom of the table.

**Table K. Delivery of Air Quality Action Plan Measures**

| Measure | LLAQM Action Matrix Theme | Action | Progress<br>• Emissions/Concentration data<br>• Benefits<br>• Negative impacts / Complaints | Further information |
|---|---|---|---|---|
| 1 | Monitoring and core statutory duties | Ealing to maintain the borough's 3 continuous monitoring stations and 60 diffusion tubes | **ONGOING**<br><br>Air quality monitoring via 3 continuous monitoring stations and 66 diffusion tubes continued for 2023. | Data from the continuous monitoring stations and diffusion tube can be found here: https://www.cleanairealing.co.uk/ |
| 2 | Monitoring and core statutory duties | Seek funding for a $PM_{2.5}$ monitor from S106 | **ONGOING**<br><br>The council is currently evaluating resources required to monitor for $PM_{2.5}$ at Horn Lane, or an alternative, site including installation of a new $PM_{2.5}$ monitor at the site. | |

[3] London Borough of Ealing (2023). Air Quality Action Plan 2022-2027. Available at: https://www.ealing.gov.uk/downloads/download/456/air_quality_action_plan

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| | | | Although there are no specific measures targeting the reduction of $PM_{2.5}$ currently, it is expected that the combination of actions and that are currently in force or coming into force will help to bring about a reduction of $PM_{2.5}$. However, discussions are being held with Public Health to devise policies that will specifically target the reduction of $PM_{2.5}$. | |
| 3 | Monitoring and core statutory duties | Commission and maintain monitoring of air pollution around the Southall Gasworks site | **ONGOING**<br>Southall monitoring stations were decommissioned on 08/11/2023. Council is currently evaluating resources to recommission monitoring in Southall as background site. | Historical data for the Southall air quality monitors can be found here: London Borough of Ealing - Air Quality monitoring service (airqualityengland.co.uk) |
| 4 | Emissions from developments and buildings | Ensuring emissions from construction are minimised | **ONGOING**<br>All medium to high-risk developments are required to install air quality sensors prior to any works onsite. Any exceedances are requested to be sent to AQ team to investigate. Construction sites are requested to set trigger alerts as per study by Kings College London:<br>• 15-min mean at 190µg $m^{-3}$<br>• Hourly mean at 190 µg $m^{-3}$<br>All other small-risk developments are requested to conduct visual site inspections regularly including outside the site boundary, log their observations and investigate any poor air quality exceedances. | |

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| 5a | Emissions from developments and buildings | Ensuring enforcement of Non-Road Mobile Machinery (NRMM) air quality policies | **ONGOING**<br><br>In 2023, 25 NRMM conditions were set for major planning applications.<br><br>When assessing demolition method statement and/or construction environment management plans, minor developments are made aware of NRMM policies and ensure they comply with emission standards set within the guidance.<br><br>Ealing council continues to collaborate with Merton Council to enforce the Council's NRMM policies. In 2023, 18 sites were audited by Merton Council. | |
| 5b | Emissions from developments and buildings | Reduce emissions from onsite diesel- or petrol-powered generators at construction sites | **ONGOING**<br><br>All major developments are requested to commit to no diesel-or-petrol powered generators in their Dust/Air Quality Management Plans or at minimum use Stage V NRMM compliant generator for a very limited time. | |
| 6 | Emissions from developments and buildings | Reduce emissions from CHP | **ONGOING**<br><br>All developments are heavily encouraged not to use any combustion sources for heating and hot water. In 2023, only one development was found not to be air quality neutral for building emissions and hence, an off-setting payment using DEFRA damages cost was required. | Air Quality Neutral (AQN) guidance \| London City Hall |

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| 7a | Emissions from developments and buildings | Enforce Air Quality Neutral policies | **ONGOING**<br><br>In 2023, 29 planning applications undertook Transport Assessments and/ or AQ Neutral for building emissions. Around 6 developments did not meet the AQN benchmarks for building and transport emissions of these 2 developments were required to provide additional information to show if they will be AQN for Transport emissions, this was secured via planning condition. | |
| 7b | Emissions from developments and buildings | Reduce emissions from emergency diesel- or petrol- powered generators | **ONGOING**<br><br>In 2023, 16 major developments had conditions requesting submission of post installation emission testing at the flue for an emergency generator by an accredited laboratory to ensure that $NO_x$ emissions standard of 150mg/Nm-3 (at 5% $O_2$) can be achieved. | |
| 8 | Emissions from developments and buildings | Ensuring adequate, appropriate, and well-located green space and infrastructure is included in new developments | **ONGOING**<br><br>The London Borough of Ealing's Development (Core) Strategy DPD includes a chapter "Protecting and Enhancing Ealing's Green and Open Spaces".<br><br>Major developments are checked internally using bespoke s106 calculator for provision of outdoor amenity space, children's play space and allotment / growing spaces for each development. Developers are also requested to use native species | |

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| | | | where appropriate, and for increases in habitat and biodiversity on site. | |
| 9 | Public health and awareness raising | Public Health department taking shared responsibility for borough air quality issues and implementation of Air Quality Action Plans | **ON HOLD**<br>Air quality team and Public health team to hold discussions regarding the best mechanisms to work more closely together to progress this action going forward. | |
| 10 | Public health and awareness raising | Engagement with businesses to encourage active changes to improve air quality, particularly anchor institutions – such as NHS, schools, and Ealing Council – and their local supply chains | **ON HOLD**<br>Air quality team and Public health team to hold discussions regarding the best mechanisms to work more closely together to progress this action going forward. | |
| 11 | Public health and awareness raising | Supporting direct alert service such as airTEXT, and promotion and sharing of high pollution alert services through community engagement and school events | **ONGOING**<br>Ealing continues to subscribe to GLA's air pollution alerts and the airTEXT service.<br>Public health team to explore embedding airText alerts with the weather alert system. | airText - Air pollution forecasts for Greater London, Chelmsford and Colchester |
| 12 | Public health and awareness raising | Raise public awareness about air quality and provide accurate resources for the public to use to find out about air pollution in Ealing | **ONGOING**<br>In 2023, Ealing published the Air Quality Strategy which sets out Ealing's vision to improve air quality in the borough. | Ealing Council air quality strategy 2020-30 \| Ealing Council |

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| 13 | Public health and awareness raising | Encourage schools to join the TfL STARS accredited travel planning programme<br>*Further engagement with GPs surgeries, via Public Health, to target and protect vulnerable groups from impacts of air pollution, by increasing free subscription of airTEXT* | **ONGOING**<br>Travel for Life accreditation KPIs, schools achieving:<br>• Gold: 24<br>• Silver: 7<br>• Bronze: 5<br>There are additional 13 Schools engaged & registered on Travel for Life.<br><br>In total, there are 49 schools who achieved or working towards TfL Travel for Life accreditation. | TfL Travel for Life school programme - Transport for London |
| 14 | Public health and awareness raising | Improvement of air quality in and around schools. Extend schools audits to all polluted schools (and potentially to other vulnerable groups, such as nurseries) | **ONGOING**<br>1558 school children have been cycle trained, ongoing cycle improvements, 24/7 bus lanes.<br>Air quality/active travel workshops delivered at 6 schools.<br><br>As a recipient of the DEFRA grant, 8 low-cost air quality sensors have been installed outside schools and 2 as background sensors. The project intends to use real-time data to drive behaviour change including encouraging active travel for school kids and parents and minimising wood burning. | Data from low-cost sensors can be found here: https://www.cleanairealing.co.uk/ |

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| 15 | Delivery Servicing and Freight | Update of Procurement policies to reduce pollution from logistics and servicing | **COMPLETE** | |
| 16 | Delivery Servicing and Freight | Reducing emissions from deliveries to local businesses and residents: *Council to take action to raise awareness of Air Quality amongst the business community, by preparing briefing to Ealing's largest businesses. Briefing will seek to promote use of Evs, using London mayor's Cleaner Vehicle Checker* | **COMPLETE** | |
| 17 | Borough Fleet Actions | Reducing emissions from council fleets: Migrate existing small vehicle fleet to electric vehicles | **ONGOING**<br>The council have 32 electric vehicles and will continue to grow as more electric charge points are installed. | |
| 18 | Borough Fleet Actions | Reducing emissions from council fleets*:* Smarter Driver Training for drivers of vehicles in the borough's Own Fleet i.e. through training of fuel-efficient driving and providing regular re-training of staff | **COMPLETE**<br>Ealing council currently only has zero emission vehicles for its ICT and Property Services departments and hence monitoring for idling is not required.<br>Monitoring for driver behaviour and training to address any driving issues is still ongoing. | |

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| 19 | Localised solutions | Green Infrastructure (GI) | **ONGOING**<br><br>Planning policies encourage green roofs, green walls, Sustainable Urban Drainage Systems etc.<br><br>Ealing's new Biodiversity Action Plan is a useful reference for developers and planners on how to encourage developers to increase habitat and biodiversity onsite. | Biodiversity Action Plan 2022 \| Ealing Council |
| 20 | Localised solutions | Liveable Neighbourhoods | **ONGOING**<br><br>The West Ealing Liveable neighbourhood programme has restarted, with the possibility of some schemes commencing late 2024/25. | |
| 21 | Localised solutions | Support communities wishing to enact temporary road closures, support and encourage resident-led Play Streets, and identify opportunities to increase the size and number of School Streets | **ONGOING**<br><br>27 school streets implemented as of March 2024, further roll outs are proposed twice a year (around 4-5 school streets each time) until 50 are delivered. | Location of school streets |
| 22 | Cleaner transport | Ensuring that Transport and Air Quality policies and projects are integrated | **ONGOING**<br><br>Vortex air quality monitors installed along Church Road in 2024 Q1 as part of Northolt LUF improvement scheme | Learn more about the Northolt scheme here: https://www.visionsfornortholt.co.uk/ |
| 23 | Cleaner transport | Discouraging unnecessary idling by taxis and other vehicles | **ONGOING**<br><br>Civil enforcement officers have been targeting idling vehicles at hotspot locations and requesting drivers to | |

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| | | | switch off their engines to drive awareness in the community. | |
| 24 | Cleaner transport | Using parking policy to reduce pollution emissions | **ONGOING**<br>The council now offer emission-based parking charging for resident permits and short stay non-residential visitor parking.<br>The council is currently evaluating resources required to implementing emissions-based charging for residential visitor. | Resident permit prices \| Further information about resident's permits \| Ealing Council |
| 25 | Cleaner transport | Installation of Ultra- low Emission Vehicle (ULEV) infrastructure | **ONGOING**<br>652 EV charge points installed as of 2024 Q1. | Location of charging points can be found here: Zap Map. |
| 26 | Cleaner transport | Provision of infrastructure to support cycling | **ONGOING**<br>• 100 Cycle hangars installed as of 2024 Q1<br>• 35% of Ealing residents do 20 mins of active travel daily in 2022/23<br>• 21% of residents live within 400m of the strategic cycle network | |
| 27 | Cleaner transport | Increase cycle training with schools and adults | **ONGOING**<br>358 adults undertook cycle training in 2023/2024 FY | |
| 28 | Cleaner transport | Provision of infrastructure to support pedestrians | **ONGOING**<br>• Active travel schemes are being implemented in Northolt as part of the Levelling Up Fund, these schemes are being monitored via additional diffusion tubes scattered throughout both corridors | Further information on Northolt scheme can be found here: https://visionsfornortholt.co.uk/ |

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| | | | • Delivery for the Kensington Road cycle scheme and Ealing Road shopping parade schemes commenced in 2023/24 and are expected to be completed in early 2024/25<br>• Mandeville Road, Church Road and White Hart Roundabouts works are due to commence also in 2024/25<br><br>All projects are due to be completed by the end of March 2025.<br><br>In addition, the council are delivering a series of new local active travel schemes 24/25 as part of the emerging "FUN" strategy. The pilot projects are:<br>• Occupation Lane<br>• Kelvin Gardens<br>• Adrienne Avenue<br>• Green Man Passage, Brownlow Road and Jacobs Ladder (West Ealing)<br>• Culmington Road<br>• Leighton Road /Elthorne Park Road<br>• Golf Links East Acton<br><br>Active Travel schemes are to be implemented in Southall from 2024/25 as a result of the Get Southall Moving project. | Further information on Get Southall Moving project can be found here: https://letsgosouthall.org.uk/ |
| 29 | Cleaner transport | Increasing the proportion of electric and hydrogen vehicles | **ON HOLD** | |

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| | | and low emission vehicles in Car Clubs | No car club projects have been progressed for this period. Major developments are requested to include car club bays where possible. | |

## 3. Planning Update and Other New Sources of Emissions

### Table L. Planning requirements met by planning applications in London Borough of Ealing in 2023

| Condition | Number |
|---|---|
| Number of planning applications where an air quality impact assessment was reviewed for air quality impacts | 102<br>(See Note 1) |
| Number of planning applications required to monitor for construction dust | 74<br>(See Note 2) |
| Number of CHPs/Biomass boilers refused on air quality grounds | 0 |
| Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions | 0 |
| Number of developments required to install Ultra-Low $NO_X$ boilers | 1 |
| Number of developments where an AQ Neutral building and/or transport assessments undertaken | 29 |
| Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation | 6<br>(See Note 3) |
| Number of planning applications with S106 agreements including other requirements to improve air quality | 44 |
| Number of planning applications with CIL payments that include a contribution to improve air quality | 0 |
| **NRMM: Central Activity Zone, Canary Wharf and Opportunity Areas**<br>Number of conditions related to NRMM included.<br>Number of developments registered and compliant.<br>Number of audits<br>% of sites unregistered prior to audit<br>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant NRMM website and that all NRMM used on-site is compliant with Stage IV of the Directive and/or exemptions to the policy. | N/A |
| **NRMM: Greater London (excluding Central Activity Zone, Canary Wharf and Opportunity Areas)**<br>Number of conditions related to NRMM included.<br>Number of developments registered and compliant.<br>Number of audits<br>% of sites unregistered prior to audit<br>Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy. | 25 conditions included<br>18 sites were audited:<br>* 1 was self-compliant<br>* 11 were compliant<br>* 3 were non-compliant<br>* 2 did not require to be registered on NRMM website<br>* 1 was completed |

**Notes:**

1. This is the number of full planning applications initially reviewed by officers for air quality impacts. It does not include condition discharge applications where an air

quality condition has been set and details are submitted in compliance with the condition.

2. Monitoring is taken to include visual monitoring.
3. Two planning apps were required to provide additional information to show if they will be AQN for Transport emissions, this was secured via planning condition.

### 3.1 New or significantly changed industrial or other sources

No new sources identified.

# 4. Additional Activities to Improve Air Quality

## 4.1 London Borough of Ealing Fleet

The Council's vehicle fleet comprises of:

a) 32 zero emission fleet representing 41% of the total fleet.
b) 44 zero emission capable fleet representing 56% of the total fleet.

The rest of the fleet of 2 is not zero emission capable and represents 3%.

## 4.2 NRMM Enforcement Project

London Borough of Ealing continues to collaborate with Merton Council to enforce the Council's NRMM policies. Ealing provides Merton with a list of medium to large construction sites that have informed the council that they will be commencing works within 6 months.

The Air Quality Team at Ealing also sets NRMM conditions on major developments and ensures minor developments are aware of NRMM guidance via their Demolition Method Statement and Construction Management Plan.

## 4.2 Air Quality Alerts

The London Borough of Ealing has subscribed to airTEXT (https://www.airtext.info/) and advertises its services on Ealing Air website and on social media to raise awareness for residents to subscribe.

# Appendix A Details of Monitoring Site Quality QA/QC

## A.1 Automatic Monitoring Sites

Four of the active automatic monitoring sites in the borough were operated as part of the LAQN. Data have traceability to national standards and operational procedures defined for the LAQN. The Horn Lane site is also part of the national Automatic Urban and Rural Network (AURN), operated by the Environment Agency to monitor compliance with the EU Directives. AURN QA/QC procedures involve 4-weekly calibration of $NO_x$ and maintenance of particulate samplers.

EA010 Green Quarter is not operated as part of the LAQN and is operated by AQE. QA/QC procedures involve 4-weekly calibration of $NO_x$ and maintenance of particulate samplers.

$PM_{10}$ Monitoring Adjustment

Monitoring is conducted using TEOMs at two of the four automatic monitoring stations. There is therefore a need to eliminate the effect of changing humidity on the mass measurement; the TEOM is required to maintain the sample filter at an elevated temperature, which may lead to losses of semi-volatile species such as ammonium nitrate. The Volatile Correction Model (VCM) uses local FDMS monitoring sites to correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. This adjustment to $PM_{10}$ data is provided by the London Air Quality Network.

## A.2 Diffusion Tubes

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP) PT scheme.

AIR $NO_2$ PT forms an integral part of the UK $NO_2$ Network's QA/QC and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM). Defra and the Devolved Administrations advise that diffusion tubes used for

LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the AIR-PT scheme. The results for Socotec (formerly Environmental Scientifics Group (ESG) Didcot) were overall satisfactory. The laboratory scored 100% satisfactory results between July 2023 and August 2023 (AR058) and 100% satisfactory results between September 2023 and October 2023 (AR059).

Factor from Local Co-location Studies

Bias adjustment is a calculated factor, which shows whether diffusion tubes are over or under reading ambient concentrations and therefore allows for a correction to be made.

Ealing carries out studies at three sites where triplicate diffusion tubes are co-located with automatic monitors for the purpose of deriving a local bias adjustment factor. In 2023, the combined local bias adjustment factor derived from these studies was 0.70.

Figure 10 shows the details of the calculation of the local bias adjustment factors. The calculation of local bias adjustment factors takes into account both data capture from diffusion tubes and automatic monitors, and also the coefficient of variation (CV) of the triplicate diffusion tubes. If the CV is too high for a particular period, that period is not taken into account when calculating the local bias adjustment factor. Periods where automatic monitoring data capture rates are less than 90% are also excluded.

**Figure 10. Local Bias Adjustment Factor Calculation**

**Local Bias Adjustment Outputs - Information Only**

Go back to STEP 3 - Bias Adjustment to define factor

| | STEP 3a Local Bias Adjustment Input 1 | STEP 3b Local Bias Adjustment Input 2 | STEP 3c Local Bias Adjustment Input 3 | STEP 3d Local Bias Adjustment Input 4 | STEP 3e Local Bias Adjustment Input 5 |
|---|---|---|---|---|---|
| Periods used to calculate bias | 12 | 12 | 12 | | |
| Bias Adjustment Factor A | 0.69 (0.64 - 0.74) | 0.69 (0.65 - 0.73) | 0.74 (0.71 - 0.77) | | |
| Diffusion Tube Bias B | 45% (34% - 55%) | 46% (37% - 54%) | 35% (29% - 40%) | | |
| | | | | | |
| Diffusion Tube Mean (µg/m³) | 56.7 | 42.8 | 36.9 | | |
| Mean CV (Precision) | 6.3% | 4.8% | 3.9% | | |
| | | | | | |
| Automatic Mean (µg/m³) | 39.1 | 29.4 | 27.4 | | |
| Data Capture | 99% | 98% | 99% | | |
| | | | | | |
| Adjusted Tube Mean (µg/m³) | 39 (36 - 42) | 30 (28 - 31) | 27 (26 - 28) | | |
| | | | | | |
| Overall Diffusion Tube Precision | Good Overall Precision | Good Overall Precision | Good Overall Precision | | |
| Overall Continuous Monitor Data Capture | Good Overall Data Capture | Good Overall Data Capture | Good Overall Data Capture | | |

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| Combined Local Bias Adjustment Factor | 0.70 |

The national bias adjustment factor for co-location diffusion tube studies in 2023 analysed by Socotec (formerly Environmental Scientifics Group (ESG) Didcot) using a preparation method of 20% TEA/water was calculated to be 0.75. This has been taken from the national bias adjustment spreadsheet 03/24, as shown in Figure 11.

**Figure 11. National Bias Adjustment Factor Calculation**

**National Diffusion Tube Bias Adjustment Factor Spreadsheet** — Spreadsheet Version Number: 03/24

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2024
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

**Step 1:** Select the Laboratory that Analyses Your Tubes from the Drop-Down List — If a laboratory is not shown, we have no data for this laboratory.

**Step 2:** Select a Preparation Method from the Drop-Down List — If a preparation method is not shown, we have no data for this method at this laboratory.

**Step 3:** Select a Year from the Drop-Down List — If a year is not shown, we have no data[2]

**Step 4:** **Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.**

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

| Analysed By[1] | Method (To undo your selection, choose (All) from the pop-up list) | Year (To undo your selection, choose (All)) | Site Type | Local Authority | Length of Study (months) | Diffusion Tube Mean Conc. (Dm) (µg/m³) | Automatic Monitor Mean Conc. (Cm) (µg/m³) | Bias (B) | Tube Precision[5] | Bias Adjustment Factor (A) (Cm/Dm) |
|---|---|---|---|---|---|---|---|---|---|---|
| SOCOTEC Didcot | 20% TEA in water | 2023 | KS | New Forest District Council | 10 | 32 | 21 | 50.1% | G | **0.67** |
| SOCOTEC Didcot | 20% TEA in water | 2023 | KS | Marylebone Road intercomparison | 11 | 52 | 38 | 37.1% | G | **0.73** |
| SOCOTEC Didcot | 20% TEA in water | 2023 | R | South Oxfordshire Distric Council | 12 | 22 | 16 | 33.9% | G | **0.75** |
| SOCOTEC Didcot | 20% TEA in water | 2023 | R | South Oxfordshire District Council | 10 | 33 | 29 | 15.8% | G | **0.86** |
| SOCOTEC Didcot | 20% TEA in water | 2023 | | **Overall Factor[3] (4 studies)** | | | | **Use** | | **0.75** |

## Discussion of Choice of Factor to Use

A conservative approach was taken, with the national bias adjustment factor selected to be applied to the 2022 monitoring data as it is slightly higher than the local factor.

Table M presents the bias adjustment factors used for LAQM purposes in the borough since 2017.

**Table M. Bias Adjustment Factor**

| Year | Local or National | If National, Version of National Spreadsheet | Adjustment Factor |
|---|---|---|---|
| 2023 | National | 03/24 | 0.75 |
| 2022 | National | 03/23 | 0.76 |
| 2021 | Local | - | 0.76 |
| 2020 | Local | - | 0.80 |
| 2019 | Local | - | 0.79 |
| 2018 | Local | - | 0.84 |
| 2017 | Local | - | 0.72 |

## A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

Where data capture is less than 75% and greater than 25% of a full calendar year (between 3 and 9 months), the mean should be “annualised” – i.e. adjusted using the methodology outlined in LLAQM.TG(19) before being compared to annual mean objectives.

There were three diffusion tube locations which required annualisation, EA8, EA62 and EA64. At two of the automatic monitoring sites (EA8 and E13), data capture was below <25% for $PM_{10}$ and hence these sites were unable to be annualised.

The continuous monitoring data chosen for annualisation of diffusion tube $NO_2$ data were the following AURN urban background sites: London Bloomsbury, London Hillingdon and London Westminster.

Table N outlines the calculations for the annualisation factors applied to the $NO_2$ monitoring data.

Distance Adjustment

If an exceedance is measured at a monitoring site which is not representative of public exposure, the procedure specified in LLAQM.TG(19) is used to estimate the concentration at the nearest receptor. Distance correction was required at one location in 2023. Background concentrations have been obtained from Defra-mapped background concentrations for 2023 for the grid-square where the monitoring site is located. Details of this can be found in Table Q.

**Table N. Short-Term to Long-Term Monitoring Data Adjustment**

| Site ID | Annualisation Factor London Bloomsbury | Annualisation Factor London Hillingdon | Annualisation Factor London Westminster | Average Annualisation Factor | Raw Data Annual Mean (µg $m^{-3}$) | Annualised Annual Mean (µg $m^{-3}$) | Comments |
|---|---|---|---|---|---|---|---|
| EA8 | 0.9156 | 0.9304 | 0.9109 | 0.9190 | 41.7 | 38.3 | |
| EA62 | 0.9829 | 0.9411 | 1.0018 | 0.9753 | 25.0 | 24.4 | |
| EA64 | 1.0523 | 0.9959 | 1.0415 | 1.0299 | 43.9 | 45.2 | |

## Table O. $NO_2$ Fall off With Distance Calculations

| Site ID | Distance (m): Monitoring Site to Kerb | Distance (m): Receptor to Kerb | Monitored Concentration (Annualised and Bias Adjusted (µg $m^{-3}$) | Background Concentration (µg $m^{-3}$) | Concentration Predicted at Receptor (µg $m^{-3}$) | Comments |
|---|---|---|---|---|---|---|
| EA53 | 0.5 | 2.0 | 52.9 | 21.9 | 45.3 | Predicted concentration at Receptor above AQS objective. |

## Appendix B Full Monthly Diffusion Tube Results for 2023

**Table P. $NO_2$ 2023 Diffusion Tube Results (µg $m^{-3}$)**

| DT ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Jan | Feb | Mar | Apr | May | June | Jul | Aug | Sept | Oct | Nov | Dec | Annual Mean: Raw Data | Annual Mean: Annualised and Bias Adjusted (0.75) | Annual Mean: Distance Corrected to Nearest Exposure | Comment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA1 | 516368 | 182978 | **51.1** | **49.9** | **42.9** | **41.3** | 27.6 | 38.1 | 33.5 | 36.9 | **41.9** | **43.3** | **41.7** | 25.1 | 39.4 | 29.6 | | |
| EA2 | 516704 | 180505 | **46.8** | **47.0** | 37.6 | 36.3 | 25.0 | 26.0 | | **42.8** | **42.9** | **49.8** | **46.5** | 37.5 | 39.8 | 29.9 | | |
| EA3 | 514740 | 180643 | 24.9 | 23.9 | 15.8 | 17.9 | 10.1 | 13.9 | 14.1 | 17.2 | 19.5 | 19.7 | 19.5 | 18.1 | 17.9 | 13.4 | | |
| EA4 | 515451 | 180894 | 39.4 | **40.8** | 29.6 | 27.5 | | 27.8 | 21.4 | 30.6 | 30.9 | 35.6 | 32.5 | 28.9 | 31.4 | 23.5 | | |
| EA5 | 516301 | 178892 | **41.0** | **47.0** | 31.1 | 37.0 | 31.9 | 32.1 | 23.4 | 30.9 | 33.6 | 35.8 | 32.1 | 26.8 | 33.6 | 25.2 | | |
| EA6 | 515180 | 180111 | **45.9** | **46.6** | **40.4** | **43.0** | 34.8 | **40.9** | 29.5 | 38.7 | **45.5** | **47.9** | **42.5** | 30.3 | **40.5** | 30.4 | | |
| EA7 | 513476 | 178561 | 38.6 | 35.3 | 23.8 | 25.6 | 19.0 | 21.1 | 20.1 | 25.6 | 26.3 | 27.4 | 28.7 | 23.1 | 26.2 | 19.7 | | |
| EA8 | 512341 | 179186 | **48.2** | **50.9** | | **42.9** | | 35.5 | | | **44.3** | **41.9** | 36.8 | 33.2 | **41.7** | 28.7 | | |
| EA9 | 512181 | 179219 | 39.1 | **41.3** | 26.9 | 26.1 | 19.3 | 25.5 | 21.3 | 27.1 | 29.9 | 30.2 | 32.5 | 27.4 | 28.9 | 21.7 | | |
| EA10 | 511196 | 179222 | **55.4** | **48.7** | 37.8 | 39.3 | 30.8 | 30.9 | 36.2 | 36.8 | **40.0** | **42.9** | **46.9** | 39.2 | **40.4** | 30.3 | | |
| EA11 | 512657 | 179712 | 35.1 | 37.4 | 25.1 | 29.4 | 23.8 | 22.4 | 19.8 | 24.3 | 23.1 | 28.5 | 33.2 | 23.1 | 27.1 | 20.3 | | |
| EA12 | 512673 | 180069 | 34.0 | 38.3 | 29.3 | 29.3 | 24.3 | 24.7 | | 27.4 | 30.6 | 35.5 | 26.4 | 25.3 | 29.6 | 22.2 | | |
| EA13 | 512768 | 180400 | **47.4** | **48.4** | **48.2** | **49.7** | 30.5 | **43.4** | | **45.8** | **52.7** | **51.0** | **44.6** | **40.0** | **45.6** | 34.2 | | |
| EA14 | 512812 | 180516 | **51.7** | **43.1** | **43.5** | 39.2 | 28.5 | 34.6 | 34.6 | 37.1 | **43.7** | **44.5** | 36.6 | **40.1** | 39.8 | 29.8 | | |
| EA15 | 512442 | 183769 | **43.3** | **44.9** | 32.3 | 31.9 | 30.4 | 24.3 | 22.7 | 26.9 | 29.8 | 38.6 | 32.7 | 23.4 | 31.8 | 23.8 | | |
| EA16 | 513056 | 184241 | **45.4** | **47.3** | 31.6 | 29.2 | 25.7 | 28.0 | 28.8 | 26.8 | 28.7 | 32.4 | 35.8 | 31.1 | 32.6 | 24.4 | | |
| EA17 | 513794 | 185348 | 37.2 | 37.5 | 29.7 | 27.9 | 15.9 | 21.5 | 20.0 | 25.1 | 30.0 | 31.8 | 32.0 | 23.6 | 27.7 | 20.8 | | |
| EA18 | 515402 | 185313 | 37.4 | 33.7 | 28.1 | 19.4 | 18.1 | 23.0 | 18.7 | 23.3 | 28.9 | 29.4 | 31.5 | 25.3 | 26.4 | 19.8 | | |
| EA19 | 514985 | 183770 | 39.6 | 39.5 | 33.0 | 26.0 | 25.1 | 25.8 | **41.2** | 26.1 | 29.3 | 32.3 | 38.9 | 24.8 | 31.8 | 23.9 | | |
| EA20 | 514691 | 183269 | 35.2 | 35.8 | 29.6 | 34.5 | 22.4 | 26.2 | 25.6 | 29.3 | 35.1 | 34.4 | 31.8 | 29.7 | 30.8 | 23.1 | | |
| EA21 | 514862 | 183137 | 35.0 | **40.3** | 25.7 | 34.7 | 25.5 | 23.8 | 16.9 | 22.8 | 19.8 | 27.3 | 35.8 | 15.8 | 27.0 | 20.2 | | |
| EA22 | 515242 | 183095 | 36.7 | 34.3 | 28.9 | 27.9 | 17.8 | 21.5 | 23.2 | 24.3 | 28.5 | 30.1 | 32.8 | 33.2 | 28.3 | 21.2 | | |
| EA23 | 517694 | 179045 | **59.0** | **53.8** | **47.4** | 36.7 | 32.7 | 37.8 | 33.9 | **42.6** | **43.7** | **42.2** | **41.6** | | **42.9** | 32.1 | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA24 | 517045 | 179292 | **46.0** | **50.0** | 37.4 | 39.4 | 31.5 | 29.1 | 23.9 | 36.4 | 28.9 | 39.5 | **44.6** | 33.9 | 36.7 | 27.5 | | |
| EA25 | 517644 | 180613 | **48.7** | **46.3** | 34.8 | 29.6 | 32.0 | 32.9 | 25.4 | 31.5 | 35.3 | 35.6 | 36.7 | 30.9 | 35.0 | 26.2 | | |
| EA26 | 517745 | 180826 | **59.6** | **59.7** | **50.1** | **46.1** | **40.7** | **46.5** | **42.7** | **49.3** | **52.4** | **50.4** | **51.7** | 38.2 | **49.0** | 36.7 | | |
| EA27 | 518022 | 181114 | **40.4** | 39.0 | 25.4 | 25.3 | 18.4 | 20.0 | 19.2 | 22.3 | 26.6 | 32.2 | 33.9 | 30.8 | 27.8 | 20.8 | | |
| EA28 | 517909 | 180971 | **50.5** | **50.6** | 39.5 | **41.2** | 31.2 | 36.8 | 32.9 | **41.1** | 37.3 | **41.2** | **44.1** | 33.7 | **40.0** | 30.0 | | |
| EA29 | 518635 | 181288 | 39.0 | 37.1 | 30.8 | 30.3 | 20.7 | 24.3 | 20.7 | 25.1 | 28.6 | 32.0 | 33.6 | 25.9 | 29.0 | 21.8 | | |
| EA30 | 518541 | 182707 | **76.2** | **61.3** | **60.3** | **54.1** | **40.2** | **47.4** | **54.3** | **57.8** | **67.2** | **62.1** | **49.1** | **50.0** | **-** | **-** | | Triplicate Site with EA30, EA31 and EA32 - Annual data provided for EA32 only |
| EA31 | 518541 | 182707 | **71.3** | **65.1** | **61.5** | **54.6** | **40.4** | **44.4** | **51.7** | **61.3** | **55.4** | **56.3** | **58.9** | **49.4** | **-** | **-** | | Triplicate Site with EA30, EA31 and EA32 - Annual data provided for EA32 only |
| EA32 | 518541 | 182707 | **65.0** | **66.8** | **61.1** | **55.7** | 39.9 | **48.4** | **56.3** | **50.9** | **79.1** | **57.1** | | **55.3** | **56.7** | **42.5** | | Triplicate Site with EA30, EA31 and EA32 - Annual data provided for EA32 only |
| EA33 | 518673 | 182982 | **60.9** | **53.5** | 31.5 | 37.3 | **45.5** | **50.5** | 35.8 | **40.4** | **42.8** | **43.6** | **41.3** | 37.1 | **43.4** | 32.5 | | |
| EA34 | 519126 | 183383 | **58.8** | **61.4** | 32.7 | **49.5** | **53.5** | **43.6** | 31.2 | **41.4** | 39.2 | **43.1** | **44.5** | 37.4 | **44.7** | 33.5 | | |
| EA35 | 520020 | 182180 | **46.9** | **50.3** | 35.4 | **44.6** | **42.5** | **42.3** | 23.7 | 39.3 | 30.9 | 35.5 | 36.1 | 27.9 | 38.0 | 28.5 | | |
| EA36 | 520430 | 181950 | **48.7** | **53.7** | **42.4** | **40.8** | 34.4 | 33.5 | 32.3 | **42.8** | **48.1** | **49.1** | **49.3** | 33.3 | **-** | **-** | | Triplicate Site with EA36, EA37 and EA38 - Annual data provided for EA38 only |
| EA37 | 520430 | 181950 | **55.4** | **58.1** | **40.1** | **41.6** | 34.1 | 31.8 | 33.7 | **42.2** | **50.3** | **51.6** | **45.4** | | **-** | **-** | | Triplicate Site with EA36, EA37 and EA38 - Annual data provided for EA38 only |
| EA38 | 520430 | 181950 | **44.4** | **55.0** | **43.4** | 39.1 | 34.7 | 36.4 | 30.6 | 38.8 | **50.1** | **53.1** | **50.9** | 35.8 | **42.8** | 32.1 | | Triplicate Site with EA36, EA37 and EA38 - Annual data provided for EA38 only |
| EA39 | 520426 | 181958 | **40.4** | 39.5 | 32.3 | 34.7 | 28.8 | 27.8 | 21.3 | 25.5 | 33.4 | 37.5 | 37.0 | 16.3 | 31.2 | 23.4 | | |
| EA40 | 520780 | 182775 | **52.3** | 37.0 | 30.8 | 32.1 | 21.2 | 23.5 | 24.2 | 25.5 | | | 28.3 | | 30.5 | 22.9 | | |
| EA41 | 521312 | 182366 | **66.4** | **43.6** | 28.7 | 28.2 | 22.7 | 23.8 | 20.6 | 28.3 | 33.4 | 27.6 | **53.4** | 22.0 | 33.2 | 24.9 | | |

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|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA42 | 521587 | 182685 | 38.5 | **54.4** | **43.8** | **44.1** | 39.0 | **40.4** | 31.6 | **47.2** | **47.9** | **46.3** | **43.1** | 35.4 | **42.6** | 32.0 | | |
| EA43 | 521303 | 182056 | **42.2** | **41.7** | 28.9 | 32.6 | 24.6 | 26.7 | 21.2 | 27.3 | 28.1 | 30.0 | 37.2 | 25.0 | 30.5 | 22.8 | | |
| EA44 | 521389 | 180953 | 37.1 | 36.3 | 25.9 | 24.3 | 18.1 | 22.9 | 18.6 | 22.8 | 26.1 | 29.5 | 29.5 | 24.5 | 26.3 | 19.7 | | |
| EA45 | 521173 | 180981 | **55.6** | **48.3** | 32.2 | 35.3 | 33.9 | 30.8 | 22.9 | 26.9 | 33.1 | | | 26.2 | 34.5 | 25.9 | | |
| EA46 | 521549 | 180923 | **69.5** | **67.4** | **52.7** | **60.4** | **62.4** | | 38.3 | **52.6** | **50.7** | **49.0** | **48.4** | **42.6** | **54.0** | **40.5** | | |
| EA47 | 521557 | 180996 | **46.9** | **41.8** | 34.9 | 33.6 | 24.8 | 30.8 | 29.1 | 32.7 | 37.7 | 38.4 | 38.8 | 32.1 | 35.1 | 26.4 | | |
| EA48 | 521614 | 180852 | **54.1** | **52.8** | **41.2** | **41.9** | **40.1** | **40.1** | 27.1 | **40.1** | **42.8** | 38.5 | **40.9** | 32.6 | **41.0** | 30.8 | | |
| EA49 | 521720 | 180084 | **42.3** | 37.3 | 27.2 | 27.4 | 23.0 | 23.5 | 19.5 | 27.6 | 27.9 | 31.8 | 31.1 | 27.3 | 28.8 | 21.6 | | |
| EA50 | 521088 | 180046 | **40.9** | 36.6 | 27.8 | 26.4 | 27.3 | 26.9 | 20.3 | 28.2 | 29.6 | 27.4 | 35.3 | 25.9 | 29.4 | 22.0 | | |
| EA51 | 520285 | 180075 | **58.7** | **60.9** | **47.6** | **52.6** | **47.0** | **49.1** | **40.0** | **49.5** | **53.8** | **52.4** | **48.1** | **45.4** | **50.4** | 37.8 | | |
| EA52 | 520092 | 180063 | 38.2 | 38.6 | 24.7 | 25.6 | 22.8 | 23.3 | 16.8 | 24.3 | 24.3 | 28.8 | 32.8 | 23.1 | 26.9 | 20.2 | | |
| EA53 | 520044 | 180125 | **70.0** | **77.5** | **64.8** | **70.6** | **62.4** | | | **77.1** | **81.7** | **75.1** | **73.5** | **52.5** | **70.5** | **52.9** | **45.3** | |
| EA54 | 520484 | 178847 | **46.2** | **41.8** | 30.3 | 29.7 | | 29.2 | 20.5 | 31.1 | 32.5 | 34.3 | 38.8 | 31.4 | 33.3 | 24.9 | | |
| EA55 | 520180 | 180896 | 38.9 | **44.0** | 34.3 | 31.2 | 27.6 | 28.4 | 24.0 | 33.0 | 33.8 | 36.0 | 27.8 | 27.2 | 32.2 | 24.1 | | |
| EA56 | 520432 | 181428 | **46.2** | **49.4** | 35.8 | 34.1 | 30.9 | 32.5 | 26.0 | 32.0 | 39.2 | 39.5 | **43.2** | 32.6 | - | - | | Triplicate Site with EA56, EA57 and EA58 - Annual data provided for EA58 only |
| EA57 | 520432 | 181428 | **48.1** | **51.3** | 36.7 | 36.4 | 31.6 | 31.4 | 26.9 | 30.1 | 37.1 | 37.5 | **43.2** | 27.1 | - | - | | Triplicate Site with EA56, EA57 and EA58 - Annual data provided for EA58 only |
| EA58 | 520432 | 181428 | | **54.1** | 37.2 | 35.9 | 31.4 | 31.7 | 28.3 | 32.0 | 39.0 | **42.9** | **40.9** | 28.4 | 36.9 | 27.7 | | Triplicate Site with EA56, EA57 and EA58 - Annual data provided for EA58 only |
| EA59 | 520532 | 181517 | **40.8** | 38.9 | 26.4 | 33.6 | 26.3 | 28.9 | 21.7 | 30.1 | 33.4 | 35.5 | 36.8 | 26.2 | 31.6 | 23.7 | | |
| EA60 | 520739 | 181824 | **42.9** | **41.1** | 30.2 | 32.0 | 24.1 | 26.8 | 19.5 | 28.7 | 32.7 | 37.5 | 36.7 | 25.0 | 31.4 | 23.6 | | |
| EA61 | 520713 | 181592 | **52.4** | **48.3** | 38.2 | 35.1 | 26.2 | 28.4 | 29.2 | 35.0 | 39.5 | 37.4 | **43.4** | 34.5 | 37.3 | 28.0 | | |
| EA62 | 512026 | 183762 | 31.6 | 33.3 | 25.7 | 25.4 | | | 15.3 | 20.2 | 23.6 | 28.3 | | 21.8 | 25.0 | 18.8 | | |
| EA63 | 513483 | 182686 | **41.4** | **43.1** | 33.1 | 27.0 | 17.8 | 22.3 | 19.2 | 25.2 | 30.1 | 33.4 | 33.8 | 25.3 | 29.3 | 22.0 | | |
| EA64 | 514378 | 182112 | **57.5** | | **43.6** | 38.0 | 35.5 | | 37.5 | **43.1** | **49.0** | **46.9** | | | **43.9** | 33.9 | | |

| | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| EA65 | 515276 | 181990 | 35.3 | 31.5 | 22.0 | 20.5 | 14.2 | | | 19.5 | 23.5 | 26.4 | 29.4 | 11.0 | 23.3 | 17.5 | | |
| EA66 | 514521 | 182949 | **40.4** | **40.8** | 28.1 | 31.8 | 20.5 | 23.2 | 19.3 | 23.7 | 31.4 | 29.1 | 33.3 | 18.4 | 28.3 | 21.3 | | |

☒ **All erroneous data has been removed from the $NO_2$ diffusion tube dataset presented in Table P.**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **London Borough of Ealing confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

**Notes:**

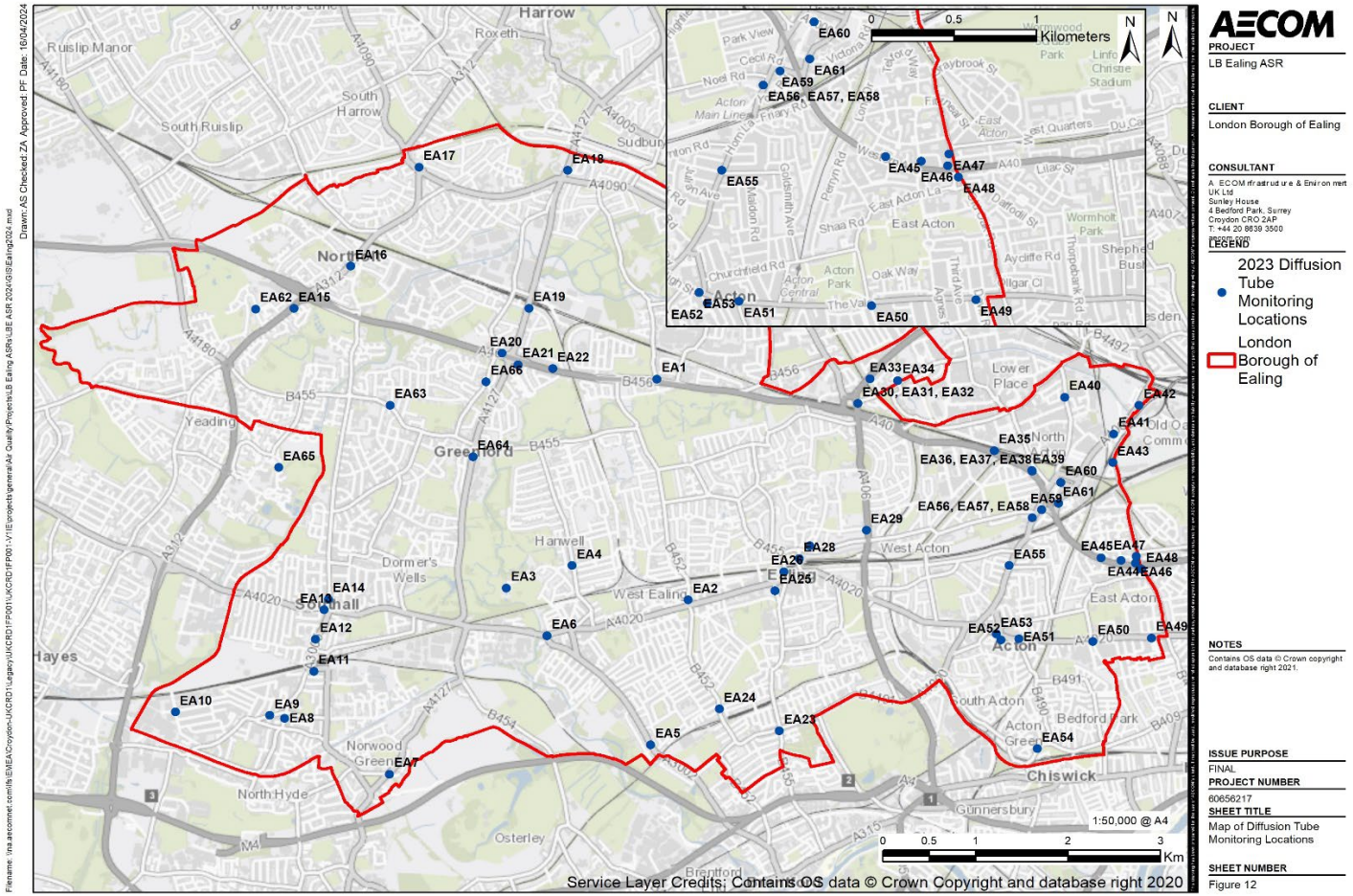
Exceedances of the $NO_2$ annual mean objective of 40µg $m^{-3}$ are shown in **bold**.

$NO_2$ annual means exceeding 60µg $m^{-3}$, indicating a potential exceedance of the $NO_2$ 1-hour mean objective are shown in **bold and underlined**.

See Appendix C for details on bias adjustment and annualisation.

# Appendix C Map(s) of Monitoring Locations and AQMAs

## Figure 12. Map of Non-Automatic Monitoring Sites



## Figure 13. Map of Automatic Monitoring Sites