London Borough of Bromley Air Quality Annual Status Report for 2023

Date of publication: June 2024

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

Contact details:

Contact: Pollution Control

Department: Public Protection and Enforcement
London Borough of Bromley

Address: Civic Centre
Stockwell Close
Bromley
BR1 3UH

e-mail: ehts.customer@bromley.gov.uk

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

Contents

Tables

Figures

Abbreviations

Abbreviation	Description
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQN	Air Quality Neutral
AQO	Air Quality Objective
AQP	Air Quality Positive
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM_{10}	Particulate matter less than 10 micron in diameter
$PM_{2.5}$	Particulate matter less than 2.5 micron in diameter
TEB	Transport Emissions Benchmark
TfL	Transport for London

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 ($PM_{2.5}$)	10 µg m^{-3} [4]	Annual mean	2040
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) [5]	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

(4) Air quality target under the Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 under the Environment Act 2021.

(5) The level for this pollutant has been met for several years and was well below the national air quality objectives, as such, it is not necessary to report upon these pollutants.

1. Air Quality Monitoring

1.1 Locations

The London Borough of Bromley has historically monitored at 6 continuous monitoring sites within the Borough, 5 of which are now closed. The one operational monitoring station is located at Harwood Avenue, Bromley monitoring NO_2, PM_{10} and $PM_{2.5}$. Table B and Figure 1 provide details of this monitoring site. Monitoring at the site has been operated by the Council since July 2011. Details of the relevant Quality Assurance/Quality Control (QA/QC) procedures that have been followed throughout the monitoring period are provided in Appendix A.

Bromley carries out passive monitoring using NO_2 diffusion tubes at 32 locations in the Borough. All the diffusion tube sites are either at roadside or kerbside locations. The Harwood Avenue diffusion tube site is co-located with the Harwood Avenue automatic monitor. Up until the end of 2020, there were 10 triplicate diffusion tube monitoring locations, at which point 22 additional diffusion tube locations were installed and all monitoring locations commissioned with one tube. Table C and Figure 1 provide details of the operational diffusion tube sites within the Borough during 2023.

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?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
BRY-CM3	Harwood Avenue	Kerbside	540523	169326	NO_2, $PM_{2.5}$ and PM_{10}	YES	Chemiluminescence, Beta attenuation monitoring (BAM)	10.8	0.4	3.5

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

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?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	Homesdale Road	Kerbside	541047	168231	NO_2	Yes	4.3	0.7	No	2.2
2	Chatterton Road	Roadside	541679	167931	NO_2	Yes	5.4	1.7	No	2.5
3	Hastings Road, McDonalds	Kerbside	542402	166012	NO_2	Yes	19.0	0.8	No	2.1
4	College Road	Kerbside	540336	170258	NO_2	Yes	10.0	0.5	No	2.3
5	London Road	Roadside	539790	170050	NO_2	Yes	7.1	1.4	No	2.3
6	Shortlands Road	Roadside	539486	169399	NO_2	Yes	8.2	1.8	No	2.2
7	Beckenham Road	Kerbside	535947	169765	NO_2	Yes	12.2	0.4	No	2.3
8	Worsley Bridge Road	Kerbside	536941	171320	NO_2	Yes	7.2	0.9	No	2.2
9	Links Way	Kerbside	537511	167277	NO_2	Yes	11.5	0.8	No	2.3
10	Elmers End Road	Roadside	536076	168434	NO_2	Yes	6.5	1.6	No	2.3
11	Anerley Road	Kerbside	535006	169590	NO_2	Yes	16.2	0.7	No	2.2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In 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)
12	Anerley Hill	Kerbside	533949	170624	NO_2	Yes	7.2	0.5	No	2.2
13	Hamlet Road	Kerbside	534052	170237	NO_2	Yes	13.4	0.6	No	2.3
14	Belvedere Road	Kerbside	533702	170354	NO_2	Yes	12.3	0.7	No	2.5
15	Glebe Way	Kerbside	538398	165925	NO_2	Yes	9.9	0.5	No	2.3
16	Ridgeway	Kerbside	540228	165941	NO_2	Yes	13.4	0.5	No	2.2
17	Crofton Road	Kerbside	543303	165256	NO_2	Yes	15.1	0.7	No	2.3
18	Towncourt Lane	Roadside	544779	166831	NO_2	Yes	3.8	2.3	No	2.3
19	High Street, Orpington	Roadside	546190	166135	NO_2	Yes	6.2	2.7	No	2.6
20	Cardinham Road	Roadside	545861	164813	NO_2	Yes	5.6	1.6	No	2.2
21	Farnborough Hill	Kerbside	545439	164034	NO_2	Yes	9.6	0.8	No	2.4
22	Poverest Road	Roadside	546821	167564	NO_2	Yes	10.9	1.6	No	2.2
23	High Street, St Mary Cray	Roadside	547168	167471	NO_2	Yes	51.0	1.3	No	2.2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In 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)
24	Midfield Way	Kerbside	546984	169905	NO_2	Yes	18.9	0.7	No	2.2
25	Ashfield Lane	Roadside	544437	170464	NO_2	Yes	11.9	1.6	No	2.2
26	Park Road	Kerbside	543930	170934	NO_2	Yes	3.6	0.9	No	2.3
27	Harwood Avenue	Kerbside	540525	169325	NO_2	Yes	10.8	0.4	Yes	2.3
28	Widmore Road	Roadside	540519	169403	NO_2	Yes	15.0	3.8	No	2.3
29	Blackbrook Lane	Roadside	542980	167735	NO_2	Yes	14.0	1.4	No	2.2
30	Old Hill	Kerbside	543452	169793	NO_2	Yes	6.7	0.4	No	2.2
31	Mottingham Road	Roadside	542847	172021	NO_2	Yes	19.6	1.8	No	2.2
32	Page Heath Lane	Kerbside	541960	168841	NO_2	Yes	2.8	0.5	No	2.4

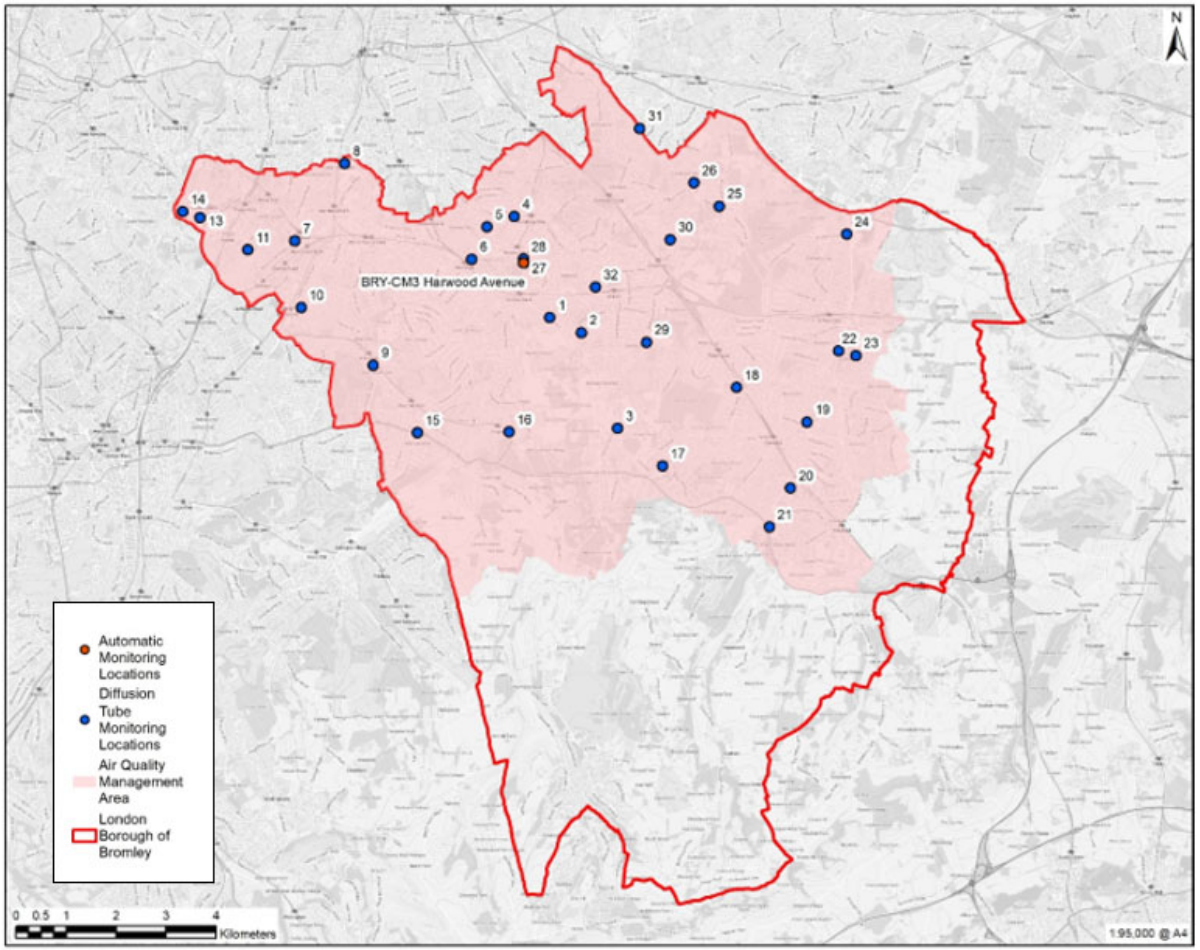
Notes:

(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.

Figure 1. Map of Monitoring Sites

The monitoring site numbers indicated on the map below correlate to the Diffusion Tube Identification numbers listed in Table C.



1.2 Comparison of Monitoring Results with AQOs

Annual mean NO_2 concentration results from the automatic monitoring station and diffusion tube monitoring locations, since 2017, are presented in Tables D to I. The results presented are following adjustments for "annualisation" and bias adjustments, the details of which are described in Appendix A.

The BRY-CM3 Harwood Avenue automatic monitor achieved 94% data capture and did not exceed the NO_2 annual mean objective of 40 µg m^{-3}. Table F presents the number of 1-Hour means where they are more than 200 µg m^{-3}; no exceedances were recorded in 2023. All data has been ratified, and details of the data ratification process are provided in Appendix A.

The diffusion tube monitoring results presented are following adjustments for "annualisation" of sites that achieved less than 75% data capture in 2023 and bias adjustments, the details of which are described in Appendix A. As the data capture for the diffusion tubes was 75% or above, annualisation was not required. Details of the QA/QC procedures applied to the diffusion tube results are also summarised in Appendix A. For those monitoring sites not located at points of relevant exposure, Defra's Diffusion Tube Data Processing Tool[2] has been used to estimate the annual mean NO_2 concentrations at the nearest location of relevant exposure, this is detailed in Appendix A.

There were no exceedances of the annual mean NO_2 concentration of 40 µg m^{-3} for the diffusion tube monitoring locations in 2023 and all diffusion tube NO_2 concentrations demonstrated a downward trend compared to 2022. In addition, as there were no diffusion tube locations which had an annual mean concentration above 60 µg m^{-3}, this indicates that the 1 hour mean NO_2 objective is unlikely to be being exceeded.

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.

[2] Defra (2024), Diffusion Tube Data Processing Tool. Available at: Diffusion Tube Data Processing Tool | LAQM (defra.gov.uk) Accessed 18/04/2024.

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	Trend
BRY-CM3	Automatic	94.0	94.0	28.6	25.7	24.7	21.3	21.8	20.1	19	↓

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 more than 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 were carried out for six months the maximum data capture for the full calendar year would be 50%).

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	Trend
1	541047	168231	Diffusion tube	100.0	100.0	**54.3**	**43.5**	39.4	29.3	30.9	28.6	24.2	↓
2	541679	167931	Diffusion tube	100.0	100.0	-	-	-	-	18.3	18.1	14.8	↓
3	542402	166012	Diffusion tube	100.0	100.0	-	-	-	-	27.5	27.6	24.1	↓
4	540336	170258	Diffusion tube	100.0	100.0	36.4	35.6	33.1	25.7	25.5	25.6	23.0	↓
5	539790	170050	Diffusion tube	82.2	82.2	**43.3**	37.6	37.6	27.7	26.8	24.6	22.4	↓
6	539486	169399	Diffusion tube	100.0	100.0	37.3	35.3	36.0	27.7	27.1	25.4	22.4	↓
7	535947	169765	Diffusion tube	92.3	92.3	38.0	38.2	36.0	28.6	30.2	28.8	25.7	↓
8	536941	171320	Diffusion tube	91.0	91.0	-	-	-	-	20.6	20.0	17.8	↓
9	537511	167277	Diffusion tube	100.0	100.0	-	-	-	-	25.4	24.6	21.9	↓
10	536076	168434	Diffusion tube	100.0	100.0	**59.5**	**51.3**	**48.1**	39.5	37.5	35.4	31.6	↓
11	535006	169590	Diffusion tube	100.0	100.0	38.2	35.2	36.4	27.9	29.2	26.3	24.5	↓
12	533949	170624	Diffusion tube	92.3	92.3	**41.6**	39.0	**42.5**	35.1	35.9	36.2	30.2	↓
13	534052	170237	Diffusion tube	100.0	100.0	-	-	-	-	26.6	26.0	23.4	↓
14	533702	170354	Diffusion tube	100.0	100.0	-	-	-	-	18.2	16.5	14.8	↓

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	Trend
15	538398	165925	Diffusion tube	100.0	100.0	-	-	-	-	27.9	27.9	23.4	↓
16	540228	165941	Diffusion tube	100.0	100.0	-	-	-	-	16.2	15.3	12.5	↓
17	543303	165256	Diffusion tube	100.0	100.0	-	-	-	-	25.0	25.7	23.4	↓
18	544779	166831	Diffusion tube	100.0	100.0	-	-	-	-	15.4	14.6	12.8	↓
19	546190	166135	Diffusion tube	100.0	100.0	-	-	-	-	**41.9**	**40.6**	38.8	↓
20	545861	164813	Diffusion tube	100.0	100.0	-	-	-	-	19.4	18.3	16.0	↓
21	545439	164034	Diffusion tube	100.0	100.0	-	-	-	-	33.3	30.5	27.4	↓
22	546821	167564	Diffusion tube	84.1	84.1	-	-	-	-	22.4	19.8	17.7	↓
23	547168	167471	Diffusion tube	100.0	100.0	-	-	-	-	25.1	23.7	21.7	↓
24	546984	169905	Diffusion tube	100.0	100.0	-	-	-	-	24.7	24.0	19.6	↓
25	544437	170464	Diffusion tube	100.0	100.0	-	-	-	-	19.6	18.9	15.2	↓
26	543930	170934	Diffusion tube	90.4	90.4	-	-	-	-	21.0	19.8	16.2	↓
27	540525	169325	Diffusion tube	100.0	100.0	30.3	27.3	28.3	21.4	21.1	20.5	19.4	↓
28	540519	169403	Diffusion tube	92.3	92.3	**43.4**	39.1	38.4	30.9	32.8	31.1	28.8	↓
29	542980	167735	Diffusion tube	90.4	90.4	-	-	-	-	23.0	21.5	17.8	↓

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	Trend
30	543452	169793	Diffusion tube	100.0	100.0	-	-	-	-	26.6	23.3	20.4	↓
31	542847	172021	Diffusion tube	100.0	100.0	-	-	-	-	29.7	26.4	24.6	↓
32	541960	168841	Diffusion tube	100.0	100.0	-	-	-	-	25.3	23.9	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%).

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

Site ID	Valid data capture for monitoring period %([a])	Valid data capture 2023 %([b])	2017	2018	2019	2020	2021	2022	2023
BRY-CM3	94.0	94.0	0	0	0	0	0	0	0

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 were carried out for six months the maximum data capture for the full calendar year would be 50%)

Figure 2 below shows the trend in annual mean NO_2 concentration at BRY-CM3 Harwood Avenue Automatic Monitor for the 2017 – 2023 period. This location shows an overall decreasing trend after a slight increase from 2020 to 2021. From 2022 to 2023 the annual mean NO_2 concentration decreased by 1.1µg m^{-3}.

Figure 2. Annual Mean NO_2 concentrations at the Harwood Avenue Automatic Monitoring Site

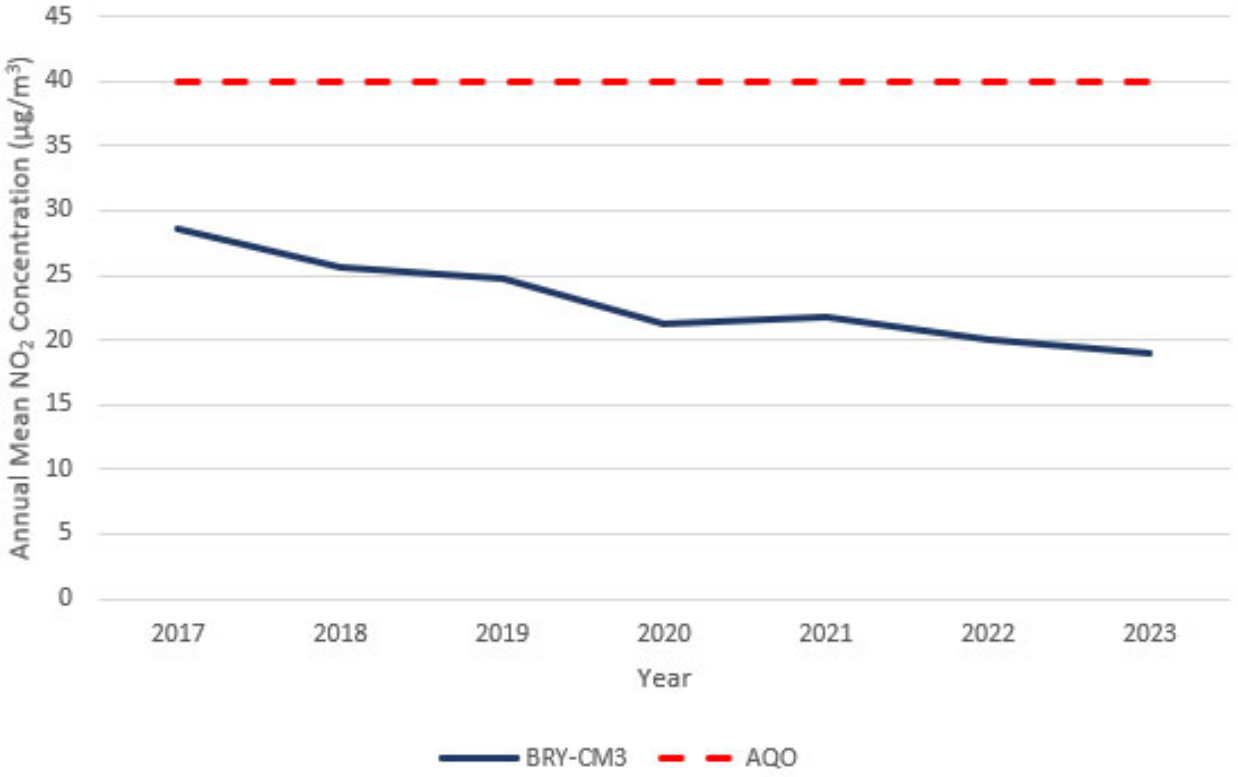


Figure 3 below shows the trends in annual mean NO_2 concentrations for the original 10 non-automatic monitoring sites for the 2017 – 2023 period. Please refer to Table E for full results.

Figures 4 & 5 below show the trends in annual mean NO_2 concentrations for the additional 22 non-automatic monitoring sites installed in 2021 for the 2021 – 2023 period. Please refer to Table E for full results.

Figure 3. Annual Mean NO_2 concentrations for the original 10 Non-Automatic Monitoring Sites

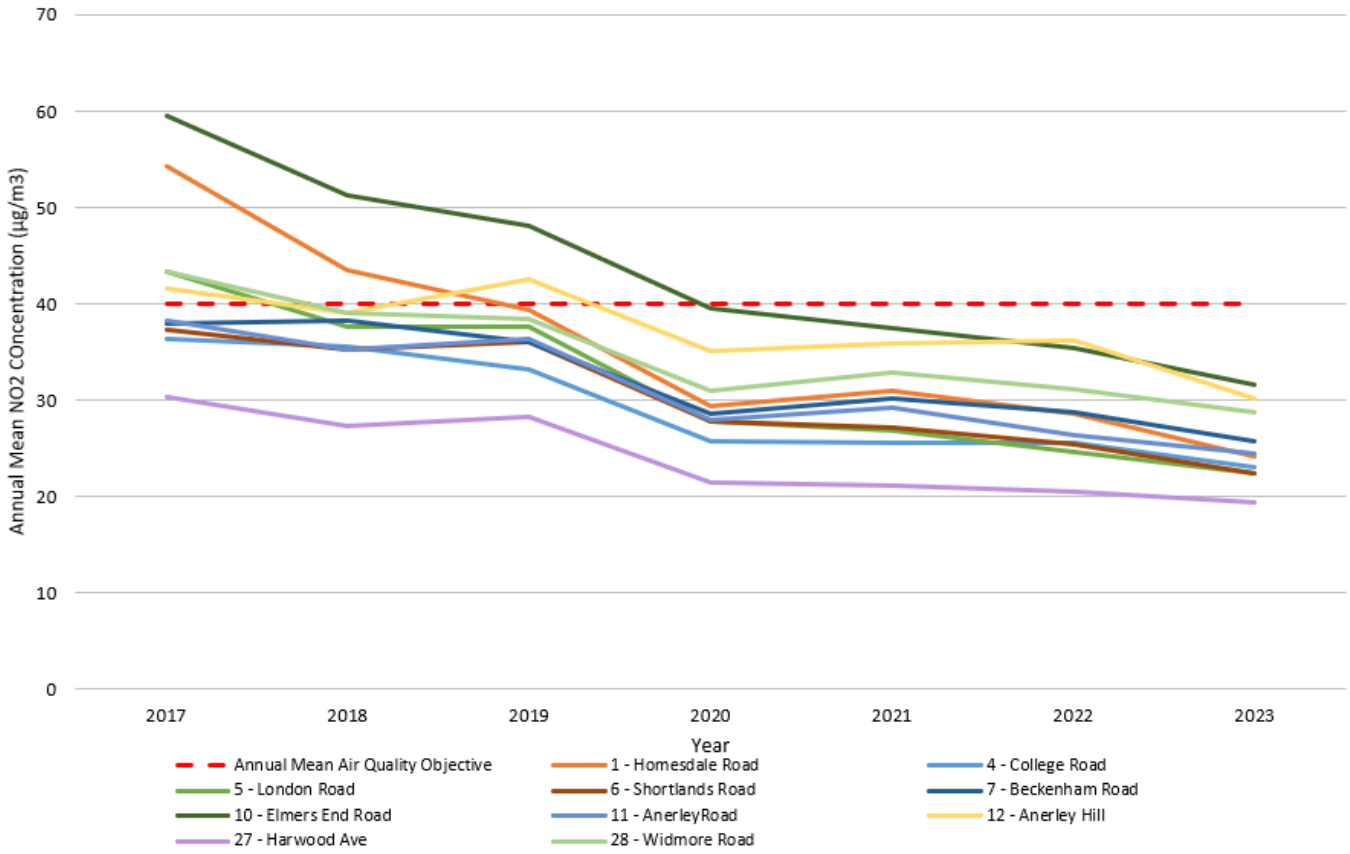


Figure 4. Annual Mean NO_2 concentrations for the additional Non-Automatic Monitoring Sites (Tubes 2-19)

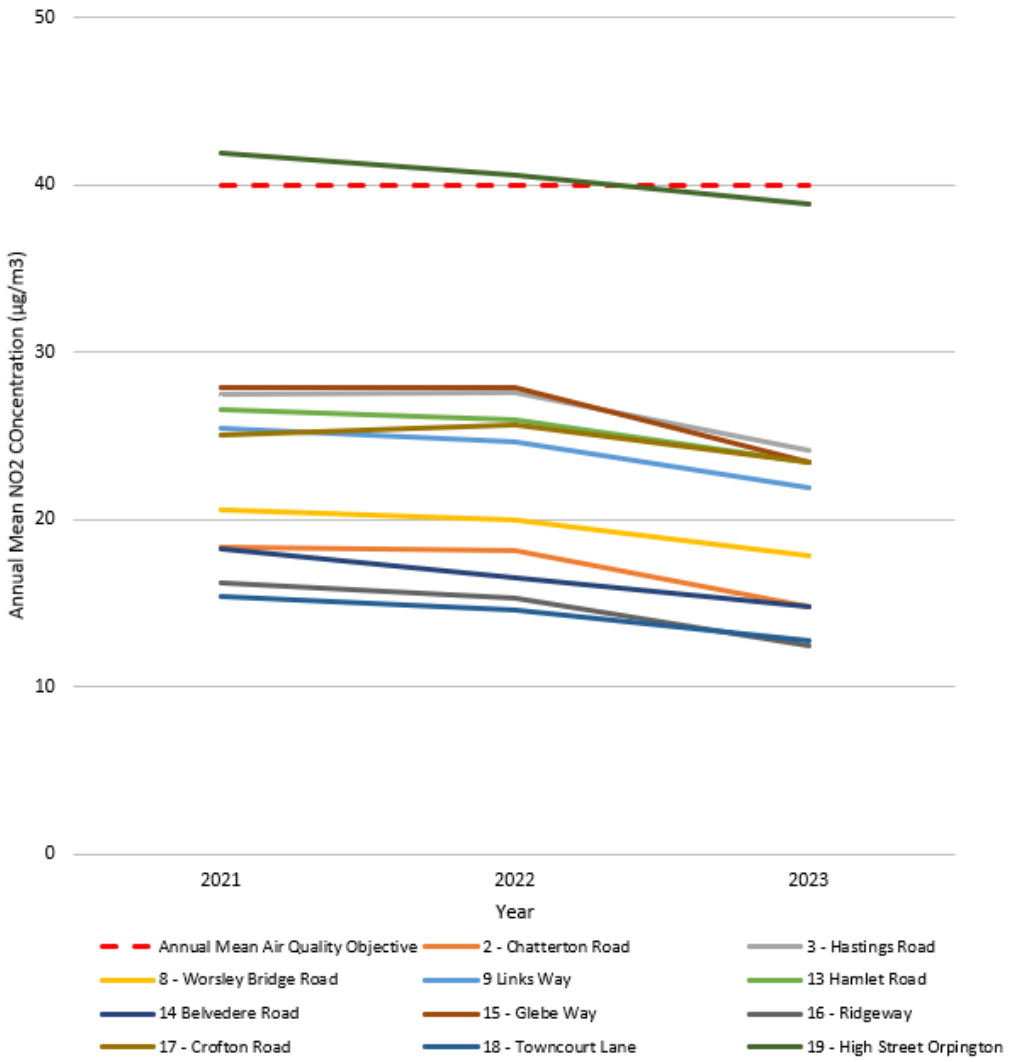
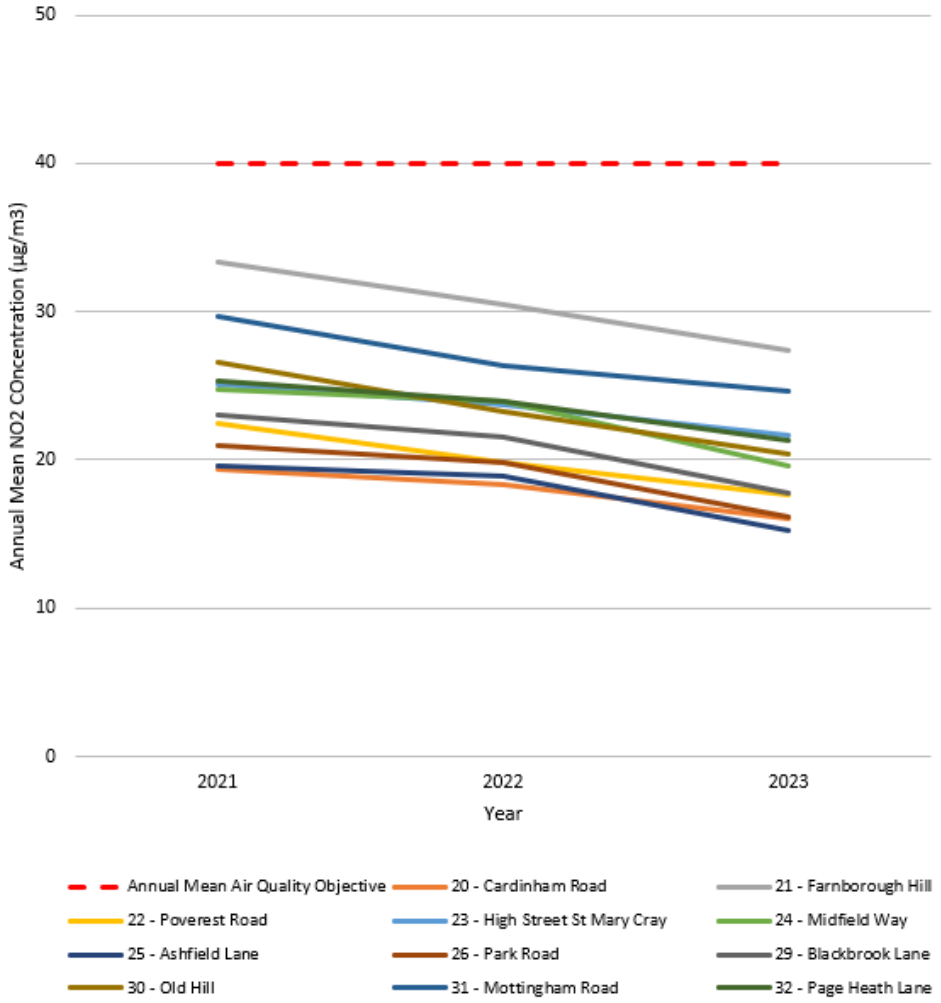


Figure 5. Annual Mean NO_2 concentrations for the additional Non-Automatic Monitoring Sites (Tubes 20-32)



1.3 Annual Mean NO_2 concentrations - Non-Automatic Monitoring Sites

Table E demonstrates that all diffusion tube sites show evidence of a decrease in NO_2 concentrations from the start of their monitoring period to 2023. All bias adjusted diffusion tube concentrations were below the AQO in 2023.

The highest decrease in NO_2 concentration from 2022-2023 of 6.1µg m^{-3} was observed at Site 12 - Anerley Hill. The most significant decreases in NO_2 concentrations when compared to last year were also observed at the following sites:

Site 15: Glebe Way - 4.6µg m^{-3}
Site 1: Homesdale Road - 4.4µg m^{-3}
Site 24: Midfield Way - 4.4µg m^{-3}
Site 10: Elmers End Road - 3.8µg m^{-3}
Site 25: Ashfield Lane - 3.7µg m^{-3}
Site 29: Blackbrook Lane - 3.7µg m^{-3}

All other sites demonstrated a decrease in NO_2 concentrations of between 0.2 to 3.5µg m^{-3}. The decrease in NO_2 concentration at Site 10, Elmers End Road, is significant as this is within an Air Quality Focus Area. This may be attributable to a change in bus movement configurations for the number 289 bus, where buses have had priority turning right since the end of 2022.

The bias adjusted NO_2 concentration at Site 19 - High Street, Orpington of 38.8µg m^{-3}, although below the AQO of 40 µg m^{-3}, fell within the 10% tolerance of the AQO and required distance correction for location of relevant exposure. Following this calculation, the predicted concentration at the site was 31.5µg m^{-3} (further details of this calculation are presented in Appendix A). In 2022, Site 19 recorded a bias adjusted NO_2 concentration of 40.6µg m^{-3}, and after distance correction, the concentration was predicted to be 33.9µg m^{-3}. This demonstrates that a bias adjusted decrease in NO_2 concentration of 1.8µg m^{-3} was observed at this site and a distance corrected decrease in NO_2 concentration of 2.4µg m^{-3} was observed from 2022 to 2023.

In general, it appears that there was a significant reduction in NO_2 concentrations during the Covid-19 pandemic restrictions in 2020. Since then, NO_2 concentrations have increased slightly from those low levels, however, they have not returned to pre-pandemic levels, this is likely due to the cumulative impact of changes in work patterns and a reduction in commuting by car.

Overall, NO_2 concentrations observed in 2023 demonstrated reductions across all sites. The longer-term trend from 2017 to 2023 shows NO_2 concentrations have reduced. The Ultra-Low Emission Zone was expanded to Outer London on 29th August 2023, so any indication of NO_2 reductions resulting from the introduction of this measure cannot be reliably drawn until next year.

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
BRY-CM3	91.0	91.0	16.8	16.5	18.8	15.8	15.4	14.7	13.0

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 were carried out for six months the maximum data capture for the full calendar year would be 50%).

The Council has been monitoring PM_{10} within the Borough since October 1999. The only operational monitoring station is at Harwood Avenue. A Beta Attenuation Monitor (BAM) is used for monitoring PM_{10}. 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 at the site in 2023 was 91%. The annual mean PM_{10} concentration in 2023 was 13.0 µg m^{-3}, which is below the annual mean objective of 40 µg m^{-3}. Annual mean concentrations have decreased steadily since 2019 and decreased by 1.7 µg m^{-3} in the last year. The overall trend in PM_{10} annual mean concentrations is demonstrated in Figure 6. There were no days where the average concentration was above the 24-hour mean air quality objective value of 50 µg m^{-3}.

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
BRY-CM3	91.0	91.0	2(30)	0(26)	8	1	0	0	0

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 were carried out for six months the maximum data capture for the full calendar year would be 50%).

Figure 6. Annual Mean PM_{10} concentrations at Harwood Avenue Automatic Monitoring Site

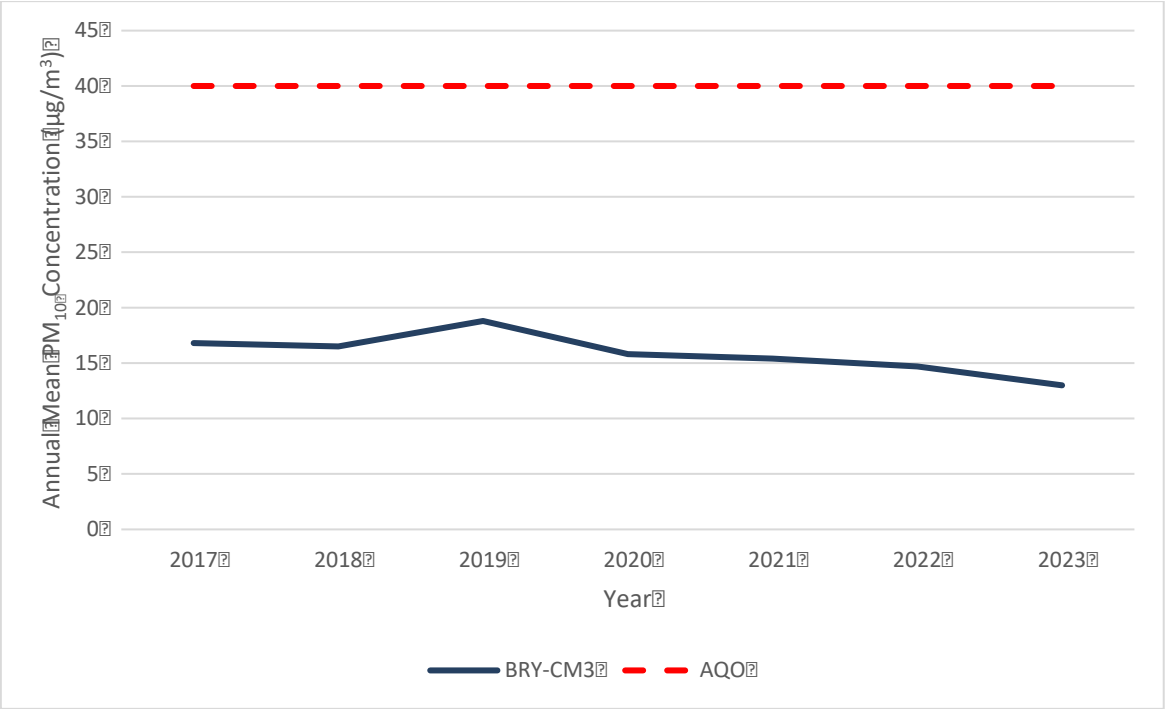


Table I. Annual Mean $PM_{2.5}$ Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period %[(a)]	Valid data capture 2023 %[(b)]	2017	2018	2019	2020	2021	2022	2023
BRY-CM3	92.0	92.0	-	-	-	8.5	9.7	10.6	10.0

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 were carried out for six months the maximum data capture for the full calendar year would be 50%).

In 2015, an inlet particle sensor was attached to the PM_{10} monitor to monitor $PM_{2.5}$. This monitoring technique was not reference equivalent and as such provided indicative results. In 2020, a $PM_{2.5}$ beta attenuation monitor (BAM) was added to the existing continuous monitoring site at Harwood Avenue, to replace the $PM_{2.5}$ inlet particle sensor.

The annual mean $PM_{2.5}$ results from the BAM in 2023 are shown in Table I. Annual mean concentrations increased between 2020 and 2022 but decreased by 0.6 µg m^{-3} in 2023 to a concentration of 10 µg m^{-3}**,** which is below the annual mean objective of 20 µg m^{-3}. This also currently meets the air quality target under the Environment Act 2021, of an annual mean of 10 µg m^{-3} to be achieved by 2040. Data capture in 2023 was 92%.

It should be noted that the $PM_{2.5}$ data capture in 2020 and 2021 was below the valid data capture requirement of 90% to be used as part of the London Air Quality Network. This was largely due to the monitors installation in 2020 and technical issues resulting in periods of down time.

1.4 Air Quality Sensors

The Council are supporting Breathe London with five monitors. Table J shows a list of the monitors with the annual mean for NO_2 and $PM_{2.5}$ in 2023. This monitoring technique is not reference equivalent and as such provides indicative results.

The locations of the Breathe London Nodes can be found here: Node Search — Breathe London

Table J. - Annual mean of NO_2 and $PM_{2.5}$ of the Breathe London Nodes within London Borough of Bromley (µg m^{-3})

Node Name	Valid data capture 2023 %[a]	Valid data capture for operational period in year 2023 %[b]	NO_2			$PM_{2.5}$			Trend
			2021	2022	2023	2021	2022	2023	2022-2023
Beckenham Beacon Hospital	96	96		26.8	23.4		7.8	7.2	↓
Bethlam Royal Hospital	99	99		22.9	21.5		8.1	7.5	↓
Orpington Hospital	96	96		23.3	22.0		7.7	7.1	↓
Poverest Allotment	99	99	26.2	23.8	22.4	9.3	8.2	7.9	↓
Princess Royal Hospital	99	99	22.1	22.2	19.2	10.7	10.0	8.0	↓

Notes:

(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 were carried out for six months the maximum data capture for the full calendar year would be 50%).

Beckenham Beacon, Bethlam Royal Hospital and Orpington Hospital Nodes became operational in August, July, and June 2022, respectively.

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 the AQMA declared by the London Borough of Bromley can be found in

Table K. The table presents a description of the AQMA that is currently designated within the London Borough of Bromley. Appendix D provides a map of the AQMA and the air quality monitoring locations in relation to the AQMA. The air quality objective pertinent to the current AQMA designation is as follows:

- NO_2 annual mean.

Table K. 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
London Borough of Bromley's AQMA	09/09/2020	NO_2	E.g., An area encompassing the whole borough except for Biggin Hill, Darwin and parts of Cray Valley East and Chelsfield & Pratts Bottom	No - TFL	LAEI Model, 2020	n/a – monitored data does not show an exceedance	4 years (1)	Air Quality Action Plan, 19th September 2020	Air Quality Action Plan (AQAP)

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

☒ **The London Borough of Bromley confirm that all current AQAPs have been submitted to GLA**

(1) 4 years compliance is based on distance adjusted data which reflects predicted exposure at the nearest sensitive receptor – see data in Appendix C

2.2 Air Quality Action Plan Progress

Table L provides a summary of Bromley's progress against the Air Quality Action Plan, showing progress made this year.

Table L. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	Progress
1. Ensure that appropriate and effective monitoring is undertaken across Bromley to meet statutory obligations			
1.1	Monitoring and other core statutory duties	Ongoing maintenance of the Harwood Ave air quality monitoring station (AQMS) (%) Target: data capture over 90%	Completed for 2023. Ongoing
1.2	Monitoring and other core statutory duties	Publish an annual report of air quality data on Bromley's website The successful submission and publication of Annual Status Reports and other statutory documents to the GLA	Completed annually
1.3	Monitoring and other core statutory duties	Seek funding where appropriate (via s106 agreements) for reference monitoring in Bromley Submissions	Ongoing
1.4	Monitoring and other core statutory duties	Review of diffusion tube network following the extension of the AQMA and add additional diffusion monitoring points (no.)	Completed. In January 2021, the number of monitoring locations increased from 10 to 32 and these have been analysed monthly since
1.5	Monitoring and other core statutory duties	Seek funding for AQMS to measure PM_{10} and $PM_{2.5}$, NO_2 and O_3 at Biggin Hill by local agreement	Air quality monitoring is in place at Biggin Hill Airport for PM1, PM2.5, PM4 and PM10, Nitrogen Dioxide (NO_2) and Sulphur Dioxide (SO_2)
1.6	Monitoring and other core statutory duties	Prioritise the provision of a $PM_{2.5}$ monitor if installing new monitors	Completed. A $PM_{2.5}$ BAM was installed at Harwood Monitoring Station. There are no current plans to install further monitoring stations
1.7	Monitoring and other core statutory duties	Seek to test appropriate new smart monitoring technologies as they develop.	Report based on horizon scanning and reviewing of current and emerging technology completed for 2023 (Keeping up to date on progress and research: www.researchgate.net/publication/335466076_Review_of_the_Performance_of_Low-Cost_Sensors_for_Air_Quality_Monitoring. AQ sensors were installed as part of Breathe London at the Princess Royal Hospital, Beckenham Beacon Hospital, Bethlam Royal Hospital, Orpington Hospital and Poverest Allotment in 2021 (see chapter 1.3). The research is ongoing

Measure	LLAQM Action Matrix Theme	Action	Progress
1.8	Monitoring and other core statutory duties	Continue to support major developers in siting and installing construction site dust monitors Advice given though planning consultation system. Outputs – number of planning conditions /reports provided. Reported annually in the Annual Status Report (ASR)	Completed for 2023 - see 2.9 for numbers of Construction Management Plan conditions recommended to planners which includes the management and monitoring of dust on site
1.9	Monitoring and other core statutory duties	Membership of the LAQN renewed.	Membership maintained. Bromley's site makes an essential contribution to the LAQN. This network provides published information for forecasting air quality and predictive triggers for data dissemination
1.10	Monitoring and other core statutory duties	Borough review of Part B (Environmental Permitting) processes to ensure all relevant process are captured (%) Borough wide review to be completed by the end of 2021.	The Borough wide review is completed. All premises that require a permit have one in place or have applied
2. Ensuring emissions from demolition and construction are minimised			
2.1	Emissions from developments and buildings	Require Construction Environmental Management Plans for 100% of major developments where works are likely to produce levels of dust (%)	Conditions imposed on all relevant applications
2.2	Emissions from developments and buildings	Require real-time PM_{10} monitoring at high-risk sites in accordance with the Mayor of London Supplementary Planning Guidance (SPG). (%)	Air Quality Assessments accompany relevant planning applications, produced in accordance with best practice guidance
2.3	Emissions from developments and buildings	Enforcement visits when complaints received. (%)	100% of complaints were appropriately responded to
2.4	Emissions from developments and buildings	Update Bromley's existing Code of Construction Practice (CoCP)	Completed. (London Borough of Bromley has adopted the GLA CoCP documents as its own CoCP)
2.5	Emissions from developments and buildings	Produce information for developers to promote low combustion and combustion free development	Completed (This information has been produced and will be available on Bromley's website soon)
2.6	Emissions from developments and buildings	Adopt revised planning conditions and informatives regarding the use of diesel generators Adoption of any additional information/Informatives.	Completed (Requirements where practicable adopted in CEMPs as part of the approved planning process. Details also included in draft CoCP. Also, a Bromley Communique for developers was produced on 21st December 2021 to promote low combustion and combustion free development)

Measure	LLAQM Action Matrix Theme	Action	Progress
2.7	Emissions from developments and buildings	Effectively manage and mitigate emissions of development taking place in the designated Air Quality Focus Area (AQFAs) through New Bromley plan	Conditions imposed on relevant applications
2.8	Emissions from developments and buildings	Where appropriate, use planning obligations to secure funding from developers for monitoring compliance checks on major and/or sensitive sites.	Completed for 2023
2.9	Emissions from developments and buildings	Continue to assess all relevant planning applications for their air quality impact and condition as appropriate Number of applications assessed, against no received within 28 days.	No. of applications where AQ assessment: 21 No. of planning apps required to monitor for dust: 92 No. of developments required to install ultralow NOx boilers: 106 No. of Neutral building and/or transport assessments undertaken: 21 Planning applications conditions for NRMM: 37
3.Ensuring enforcement of Non-Road Mobile Machinery (NRMM) air quality policies			
3.1	Emissions from developments and buildings	Apply conditions for construction sites to ensure compliance with the GLA's NRMM requirements *Planning conditions to include where appropriate: Air Quality Assessment Air Quality Network (AQN) assessment Construction Environment Management Plan (CEMP) to include PM10 monitoring NRMM compliance with London LEZ Seek funding for air quality measures through S.106, Community Infrastructure Levy (CIL) where feasible	100% of developments registered and compliant
3.2	Emissions from developments and buildings	Ensure emissions from construction sites are minimized through cooperation with developers and site visits, including effective dust monitoring where appropriate, and compliance with GLA NRMM requirements	Provided an updated list of Major Planning sites where construction is starting or soon to start to NRMM Project Team for inspection. 11 Audits carried out in 2023. 2 self-compliant, 4 compliant and 5 with no NRMM on site
4. Reducing emissions from CHP and ensure smaller developments use ultra-low NOx boilers			
4.1	Emissions from developments and buildings	Require developments with Combined Heat and Power (CHP) to be air quality neutral as a minimum Number of developments where AQ neutral is applied.	Air Quality Neutral Assessment provided at application stage and conditions imposed on the relevant applications
4.2	Emissions from developments and buildings	Require developers to meet the GLA's emissions limits for CHP and Biomass boilers	Use of CHP and biomass boilers assessed at application stage and conditions imposed on the relevant applications

Measure	LLAQM Action Matrix Theme	Action	Progress
4.3	Emissions from developments and buildings	Set requirement for evidence of maintenance of CHP and associated plant	Conditions imposed on relevant applications
5. Enforcing Air Quality Neutral Policies			
5.1	Emissions from developments and buildings	Apply Air Quality Positive for regeneration areas in line with the new London Plan Agree standard planning conditions to require compliance with AQN standards and London Plan policy.	Completed for 2023
5.2	Emissions from developments and buildings	Set requirement for evidence of maintenance of CHP and associated plant	Conditions imposed on relevant applications
6. Ensuring adequate, appropriate, and well-located green space and infrastructure is included in new and existing developments, where appropriate			
6.1	Emissions from developments and buildings	Planning application / conditions - Set targets to improve levels of green infrastructure provided in new developments. *To be considered on a case-by-case basis through application of relevant London Plan Policies	Assessed at the application stage and tree and landscaping conditions imposed where relevant
6.2	Emissions from developments and buildings	Ensure that exposure to poor air quality in amenity spaces is considered at design stage and as part of the Air Quality Assessment (AQA). *To be considered on a case-by-case basis through application of relevant London Plan Policies	No action required (London Plan Policies are applied to development proposals and considered via the consultation process)
7. Ensuring that Smoke Control Areas (SCA) are appropriately identified and fully promoted			
7.1	Emissions from developments and buildings	Carry out awareness campaigns in relation to bonfires and wood burning stoves and provide advice on appropriate fuel by issuing guidance Guidance to be produced by the end of 2021 and to be promoted through newsletters including 'Environment Matters'. Estimated engagement can be demonstrated through circulation outputs, website page hits. We will circulate to providers of fuels and relevant businesses, demonstrated through number of correspondences.	Part of a DEFRA bid application with Camden as the lead, researching and actioning future publicity opportunities. The Council will utilise publications such as 'Environment Matters' to provide advice

Measure	LLAQM Action Matrix Theme	Action	Progress
7.2	Emissions from developments and buildings	Effectively fulfil statutory duties as a Smoke Control Area (SCA)	100% response to SCA related complaints. 3 of 3 complaints responded to, and appropriate action taken. Includes complaints about smoke emissions from chimneys in SCAs and use of unauthorised fuels only. EXCLUDES more general enquiries about SCAs, authorised fuels, and requests for copies of SCOs
7.3	Emissions from developments and buildings	Continue to control emissions from permitted processes through inspections and enforcement (see also action 1)	24 PVR sites, 34 DC sites, crematorium, cement batching and mobile crusher inspected, following risk rating requirements
8.Deliver energy efficiency retrofitting projects in workplaces and homes through EFL retrofit programmes such as RE:NEW, RE:FIT and through borough carbon offset funds to replace old boilers /top-up lost insulation in combination with other energy conservation Measures			
8.1	Emissions from developments and buildings	Promoting and delivering energy efficiency retrofitting projects in workplaces and homes	The Energy Company Obligation (ECO) is a government scheme that requires large energy suppliers to provide funding for energy efficiency improvements to eligible households. The Greater London Authority (GLA) can declare additional households in London as eligible for ECO funding, under the ECO Flexible Eligibility scheme. Residents are directed to either the warm homes advice service, the Greater London Authority, or the Energy Savings Trust for advice on energy efficiency
8.2	Emissions from developments and buildings	Follow up proposals for inclusion in a revised policy for the retrofitting of air pollutant reduction equipment for clients living in areas identified as most likely to trigger detrimental health effects	Measure withdrawn from AQAP
8.3	Emissions from developments and buildings	Continue with the advice service for households at risk of fuel poverty in southeast London. Target- to carry out 800 home visits and 800 one-to-one advice sessions at events	Bromley is part of the South London Energy Efficiency Partnership which is coordinated by the London Borough of Lewisham. Both Charlton Athletic Community Trust (CACT) and Southeast London Community Energy (SELCE) are delivery partners in Bromley's energy efficiency outreach programs. Within this partnership CACT provide a call centre and social proscribing services and SELCE deliver energy advice. The partnership has secured some funding through the Greater London Authority's (GLA) Warmer Homes Advice Service to provide advice including 128 Healthy Homes sessions and 64 ECO referrals. SELCE report March 2023
8.4	Emissions from developments and buildings	As part of a current review of the use of discretionary grant funding linked to Disabled Facilities Grants and the Better Care Fund	The Housing Assistance Policy has been drafted and is being taken to committee in June 2024

Measure	LLAQM Action Matrix Theme	Action	Progress
8.5	Emissions from developments and buildings	All projects have a demonstrable carbon reduction and will be appraised independently. Overall organisational emissions reductions will be evidenced in the Council's Carbon Management Programme	The decarbonisation loan scheme from SALIX has been used to convert streetlights to LED lighting, this project is virtually completed with just over 400 left to convert. Carbon emissions from streetlights has seen a 60% emission reduction from baseline for the finance year2022/23. The Operational Property Repair Board strategic objectives includes carbon reduction and energy efficiency as set out in the adopted Operational Estate Strategy (Executive Nov 2022). The council continues to seek funding such as from the public sector decarbonisation grant scheme
8A. Update local authority procurement policies to reduce pollution from logistics and servicing, and to maximise air pollution benefits			
8A.1	Emissions from developments and buildings	Production of a sustainability toolkit for service leads to consider sustainability issues including carbon and air quality when initiating the procurement process.	The Councils scope 3 procured emissions, (based on service time and contract spend), have been assessed and these come to 89,571 tonnes of CO_2, (finance year 2021/22). This information is now being considered by the various service areas as to how improvements could be made over a longer timeframe to meet the goal of net zero carbon, in line with the relevant contracting strategies and service requirements
8B.1	Emissions from developments and buildings	LB Bromley Sustainability Policy to be further developed	Completed in full: A policy has been developed and stipulates that the procurement process must consider bids "seeking to minimise any negative environmental impacts of goods and services purchased, across the whole life cycle from raw material extraction to end of life"
8B.2	Emissions from developments and buildings	Seek to influence supplier behaviour through Circular Economy principles: reduced journeys, shared services, product life extension, waste minimisation, energy recovery from waste	The various service areas will continue to consider and assess opportunities to implement sustainable practices, in line with the relevant contracting strategies and service requirements
9.Ensure master planning and redevelopment areas are aligned with Air Quality Positive and Healthy Street approaches			
9.1	Emissions from developments and buildings	Update ASR and planning portal	One application submitted and pending consideration
10. Public Health department taking shared responsibility for borough air quality issues and supporting implementation of Air Quality Action Plans			
10.1	Public health and awareness raising	The Health and Well-Being Board will include a new section within the Joint Strategic Needs Assessment (JSNA) with up-to-date information on air quality impacts on the population *Public Health Team to support engagement with local stakeholders (businesses, schools, community groups and healthcare providers)	Ongoing

Measure	LLAQM Action Matrix Theme	Action	Progress
11. Engagement with businesses. This could be linked to the engagement with town centre BIDS proposed in the final LIP to promote active and public transport options to their members, reducing pollution in town centres through mode shift			
11.1	Public health and awareness raising	Promote active travel and public transport to businesses. The Council will host events such as free cycle training and Dr Bike sessions for BIDs who are proactively engaged (dependant on TFL funding and Covid restrictions)	11 Dr Bike Sessions have been delivered and cycle training has been delivered to 235 adults
12. Promotion of availability of airTEXT			
12.1	Public health and awareness raising	Public Health team to support promotion through GP practices and pharmacies Membership of airTEXT consortium	AirTEXT platform updates planned for 2025. AirTEXT subscribers in Bromley continue to receive relevant updates as per platform
13. Encourage schools to join the TFLs STARS accredited travel planning programme by providing information on the benefits to schools and supporting the implementation of such a programme			
13.1	Public health and awareness raising.	Use of the STARS programme in schools as a tool to promoting active travel to school	70% of schools have an active Travel Plan. 5 Bronze, 12 Silver and 63 Gold. This gives us a quality score of 218
14. Air quality in and around schools			
14.1	Public health and awareness raising	Ongoing co-ordination of the Heathy Schools London in Bromley project, to improve children and young people's health and well- being. Target is to add 5% more schools each year. *Over ninety schools currently participating. London Healthy Early Years (HEYL) supports and recognises achievements in child health, wellbeing, and education in early years settings. Well over one hundred Bromley Early Years settings have already registered with a target of an additional 5% year on year.	HEYL - this scheme is currently paused in Bromley. The HSL Scheme is also being revamped although we have had many bronze renewals this year, we have had no silver or gold awards
14.2	Public health and awareness raising	The borough is currently undertaking a trial of a green screen around Valley Primary School as part of the Shortlands Friendly Village (Liveable Neighbourhood) project. If successful, consideration will be given to how the green screens can be delivered to more schools in the AQMA. *This delivers on the LIP3 commitment to look to undertake a trial of new green infrastructure, such as trees and green walls around schools in the AQMA and	Research suggests that Green Screens are not as effective as they were hoped to be. More evidence of their efficacy will be required before Bromley looks to introduce further Green Screens

Measure	LLAQM Action Matrix Theme	Action	Progress
		alongside corridors with the highest concentrations as a means of natural emissions capture	
14.3	Public health and awareness raising	Promote campaign on anti-idling, involving specific signage, communications activity, and increased enforcement in idling hotspots around 8 schools (see also 21). *A more targeted approach to idling, focusing on schools will be taken, which should make a difference in areas over short periods of time, utilising a variety of comms and enforcement action	38 warnings issued
15.Update local authority procurement policies to reduce pollution from logistics and servicing			
15.1	Deliver servicing and freight	Seek to influence supplier behaviour through circular economy principles: reduced journeys, shared services, product life extension, waste minimisation, energy recovery from waste.	Circular economy workshop delivered by specialist external providers to key officers. Sustainability toolkit developed to support commissioners includes consideration of circular economy principles and how to embed these into contract requirements
15.2	Deliver servicing and freight	Require environmental services suppliers with large fleets to have attained Bronze / Silver / Gold (Fleet Operator Recognition Scheme) FORS accreditation. *Bromley's LIP3 sets out a road map to reducing emissions from the London Borough of Bromley (LBB) fleet to 2041 and working with procurement, the Council will be asked to consider how they could ask contractors to innovate towards a greener fleet and to reduce emissions from the Council's fleet.	Veolia maintained FORS Bronze accreditation in September 2023
16. Reducing emissions from deliveries to local businesses and residents			
16.1	Deliver servicing and freight	Sustainability toolkit for service leads to consider sustainability issues including carbon and air quality when initiating the procurement process. Will require measurements that are proportional and appropriate to contract size	The various service areas will continue to consider and assess opportunities to implement sustainable practices, in line with the relevant contracting strategies and service requirements
16.2	Deliver servicing and freight	LB Bromley Borough-Wide Emissions Strategy to be developed, as part of wider corporate Sustainability Policy	The Council is currently preparing a new Local Plan and as part of this new plan, section 19 of the Planning and Compulsory Purchase Act 2004 requires a Local Planning Authority to carry out a "sustainability appraisal" of The Plan. To support this process the borough's carbon emissions are being reviewed using LEGGI and the UK local authority and regional greenhouse gas emissions national statistics. The data

Measure	LLAQM Action Matrix Theme	Action	Progress
			will also inform potential opportunities for carbon reduction projects across the Borough
16.3	Deliver servicing and freight	The Council will continue to seek to work with collection locker providers to provide such facilities in some borough car parks to reduce delivery miles Provision of facilities installed.	Currently there are 19 car parks with lockers installed
16.4	Deliver servicing and freight	Any development likely to create a significant number of trips will, where necessary, is required to enter into an agreement to submit and implement acceptable Construction Logistics Plans, and Delivery/Servicing Plans. Consideration will be given to re- organisation of freight to support consolidation (or micro-consolidation) of deliveries, by setting up or participating in new logistics facilities, and/or requiring that council suppliers participate in these.	Conditions imposed on relevant applications
17. Reducing emissions from council fleets			
17.1	Borough fleet	Council fleet and hired fleet to meet Quality Standard. Operating data and feedback will be collected to help inform future replacements and procurement projects.	2 Plug-in hybrid Mayoral Cars in service. 2 hatchback cars in service with Highways Division. Initial plan prepared for charging fleet vehicles based at new Civic Offices. Continued review of options for EV's to replace existing conventionally fuelled vehicles as they become due
17.2	Borough fleet	Increase the number of plug-in hybrid and electric council vehicles through planned replacement programme	2 plug-in hybrid Mayoral Cars in service
17.3	Borough fleet	Increase the uptake of new Euro VI vehicles in the heavier fleet, phase out older vehicles operated by our contractors by April 2020	Waste Fleet Euro VI compliant. Gritter fleet currently under review by the Highways Division. Future gritters will meet the latest regulations
17.4	Borough fleet	Promote fuel-efficient driving through the driver induction and competence checks	Routine part of driver competence check for new staff, authorised to drive Council vehicles. More authorised drivers introduced to EV's as the uptake increase
17.5	Borough fleet	Work in partnership with our Waste contractor to ensure our infrastructure allows for a fully electric waste collection fleet in 2026 Improvement in infrastructure.	The target of 2026 is not going to be achieved. A decision on electrifying the waste fleet has not yet been made. An eRCV will be trialled in 2024
17.6	Borough fleet	Monitor progress with vehicle manufacturers, other similar operators, and technical developments to	Continue to keep abreast of developments within the industry and obtain best practice and examples

Measure	LLAQM Action Matrix Theme	Action	Progress
		further support the intake of alternatively fuelled vehicles.	Attended launch and demonstration of Veolia's fully electrified fleet in July 2023)
17.7	Borough fleet	Increase the use of pool vehicles Uptake monitored and reported annually.	Neighbourhood Management have explored with transport operations colleagues the change from the existing 1 x diesel van for officers to an electric alternative which will be implemented when the current vehicle's contract expires in 2024
17.8	Borough fleet	Maintain the FORS accreditation held by the Council's Waste, Streets and Parks contractors.	Veolia maintained FORS Bronze accreditation in September 2023
17.9	Borough fleet	Equip waste vehicles with the 'Driving Efficiently and Safely' (DES) tracking and monitoring system to monitor and minimise idling, braking, over-revving, and contravention of speed limits	Echo logistics was updated in 2022 and the Autonomise system was implemented which has superseded DES. All 58 Veolia owned frontline RCVs, and all Veolia owned frontline streets vehicles (15 cages, 4 Hi-Abs and 4 LMBs) are now fitted with either 360-degree cameras or forward and rear facing cameras linked to 'smart boxes' that store telemetric data for driver behaviours to measure Idling, harsh acceleration, harsh breaking, harsh cornering, speed, and g-shock
17.10	Borough fleet	Supervisors of the waste and street cleansing service to use electric vehicles	12 electric vehicles in use
17.11	Borough fleet	Installation of electric charging point for Heavy Goods Vehicles (HGVs)	There is currently no infrastructure in place for this. The decision to procure electric HGV's is still pending. There are 9 charging points in place for EM/Supervisor vehicles
17.12	Borough fleet	Increase the % of mobile equipment used (e.g., electric chainsaws) by the Arboriculture contractor	
17A. Staff Lease Car Scheme			
17A.1	Borough fleet	Promote the uptake of alternative fuel cars via the staff lease scheme. The option to further incentivise drivers will be a discussion point when approaching the next procurement exercise	Continued trend away from conventional fuels with hybrid popularity gradually increasing, now at 77 cars. EV at 11 cars
18. Expanding and improving green infrastructure			
18.1	Localised solutions	Through Planning process, identify opportunities for green infrastructure	Conditions imposed on relevant applications
18.2	Localised solutions	Feasibility of enhancing the public realm potentially through gyratory removal at Elmers End (see also 19).	Funding for LEN bid has not yet been identified
18A. Maintain and increase Council's green infrastructure			

Measure	LLAQM Action Matrix Theme	Action	Progress
18A.1	Localised solutions	Continue to provide an annual tree planting plan and where possible consider planting trees in areas where they will be of most benefit to local air quality. Progress a scheme to create/expand woodlands in the Borough.	During the 2021/22 planting season, Bromley Council, with our contractors planted 1462 trees in the borough. Of these, 1250 were brand new trees, with an additional 212 routine replacement trees. During the 2022/23 planting season, Bromley Council, with our contractors planted 1590 trees in the borough. Of these, 1250 were brand new trees, with an additional 340 routine replacement trees. The Forestry Commission have awarded funding to develop designs for three new woodland sites in the borough at ex-grazing sites with this work being undertaken into 2023)
18A.2	Localised solutions	Increase the number of street and parks trees via funding	Information on Bromley's tree planting programme is available https://www.bromley.gov.uk/trees/treemendous-tree-planting-programme-underway The Council's Treemendous tree planting programme is seeing £1.35m invested in an additional 5000 street and park trees over 4 years. 1250 of the 1590 trees planted in the 2022/23 planting season were additional, and part of the Treemendous programme. Furthermore, funding has been granted from the Platinum Jubilee Parks Fund to plant two new orchards in parks in 2023
19. Low Emission Neighbourhoods (LENs)			
19.1	Localised solutions	Review previously unsuccessful bid to the Mayor's Air Quality Fund for a Low Emission Neighbourhood in Birkbeck village in Bromley's AQMA, which is bounded by the A213 and A214 *Options are being considered for how the benefits of the scheme can be derived without LEN funding	No funding secured for LENs in LBB
19.2	Localised solutions	Feasibility study for enhancing the public realm potentially through gyratory removal at Elmers End.	Funding has not yet been secured for this project
19A. Provide waste and recycling collections specifically to reduce need for residents to make trips to Council Household Reuse and Recycling Centres			
19A.1	Localised solutions	Continue to provide existing comprehensive waste and recycling collection service	Maintained comprehensive waste and recycling collection service
19B. Reduce the Council's Environmental Services contractors transport to work emissions			

Measure	LLAQM Action Matrix Theme	Action	Progress
19B.1	Localised solutions	Provide a kerbside collection service for textiles, batteries and small electrical items*The Council provides a collection service for the Core Materials as required within the London Environment Strategy	Kerbside collection of textiles, batteries and small waste electronic and electrical items provided
19B.2	Localised solutions	Liaise with Council's contractor to expand on materials accepted at the kerbside and promote the Council's chargeable garden waste service	List of materials accepted available at www.bromley.gov.uk/wastenews Comprehensive kerbside collection service provided for the core (dry) materials, plus textiles, batteries, and small waste electricals. Promotion of garden waste is a contractual requirement and was promoted in 2023 through targeted letters, the website, social media, and articles in Environment Matters. Current number of subscriptions (Jan 2024) is 45,500
19C. Minimise dust generation at Council's Waste Transfer Stations			
19C.1	Localised solutions	Promote dust management at sites – using the accordance with the Mayor of London SPG as an exemplar	Dust management is in accordance with the environmental permit
19D. Reduce emissions from closed landfill site			
19D.1	Localised solutions	Monitor and manage landfill gas generated by closed landfill site through existing network of pipes and landfill gas flare	Landfill gas and leachate are managed at the closed landfill site in accordance with Environment Agency best practice. Management of the site is reported monthly and discussed via monthly Service Operations Board
19E. Reduce arboriculture haulage movements			
19E.1	Localised solutions	Install wood chip bins within the borough's parks instead of transporting woodchip outside the borough*Parks Contractor will be able to use woodchip for bedding, path creation rather than woodchip being used as biomass	There is a permanent woodchip store on the High Elms Estate and woodchip deliveries are carried out to Brook Lane Community Gardens on an ad hoc basis by the Council's Tree contractors. The Council has decided not to proceed with permanent woodchip bins at Brook Lane Community Gardens and Whitehall recreation ground due to concerns around fly tipping and potential damage to infrastructure by vehicles accessing these bins
20. Ensure that Transport and Air Quality policies and projects are integrated			
20.1	Cleaner transport	Through this AQAP and Bromley's LIP3 officers will continue dialogue regarding project and policy implementation. *Transport and Environmental Health staff form part of core AQAP Steering Group	Completed (This is also supported by involvement in the Green Recovery Group and other climate change discussion groups)

Measure	LLAQM Action Matrix Theme	Action	Progress
21. Discouraging unnecessary idling by taxis, coaches, and other vehicles			
21.1	Cleaner transport	The Council is participating in the London-wide anti-idling campaign funded from the Mayor's Air Quality Fund with eight schools in the borough to hold anti-idling campaigns per annum. PCN enforcement will allow for a significantly higher penalty for idling to be applied	We are now able to enforce against idling vehicles at 49 school locations in the Borough. Anti-Idling posters were installed on lamp columns outside schools to enhance the campaign message
21.2	Cleaner transport	The borough has adopted powers to enforce against idling vehicles but will look to create a Borough-wide Traffic Management Order (TMO) to allow for PCN enforcement which will be easier to enforce with existing and widely allocated Civil Enforcement Officer (CEO) resources	TMO created and in effect from April 2020. Ongoing
22.Temporary car free days			
22.1	Cleaner transport	Work with BIDs to support a suitable programme of weekend road closures to allow town centres and high streets to be used in new and innovative ways, supporting vibrant town centres and communities	Completed (A programme of weekend closures have not been taken forward. Instead, the Council has promoted street party road closures, and these have become more popular than ever before, primarily in the summer months (although these were not permitted during Covid lockdown periods)
22.2	Cleaner transport	Continue with Street Party events and engage with residents in discussions about possible changes in the locality that would enhance walking and cycling	250 events in 2023
23.Using parking policy to reduce pollution emissions			
23.1	Cleaner transport	The use of electric vehicles will be promoted by providing the appropriate infrastructure	Completed (An Electric Vehicle Charging Strategy has now been produced with the intention to introduce pilot schemes for on street charge points and residential gullies)
24. Installation of Ultra-low Emission Vehicle (ULEV) infrastructure such as electric vehicle charging points, rapid electric vehicle charging points and hydrogen refuelling stations			
24.1	Cleaner transport	Work with Bluepoint London to continue to roll out electric vehicle charging infrastructure. *There are national policies in place to influence road users' choice of vehicle, but parking policy is not considered to have an impact on the use of those vehicles	Ongoing EV trial to determine best type of EV CPs. Two additional Source London EV charging sites are now live. Further installations from Source are on hold pending the outcome of on street EV charging trial
24.2	Cleaner transport	Install 4 Rapid Charge Points as part of the TFL scheme by March 2020 along with the 4 installed on the A232 TLRN in Coney Hall and West Wickham	Ongoing EV trial to determine best type of EV CPs. Two more additional EV charging sites will be installed on the TLRN in West Wickham in 2024 in conjunction with TfL

Measure	LLAQM Action Matrix Theme	Action	Progress
24.3	Cleaner transport	Policy 30 of the Local Plan requires 1 in 5 car parking spaces to be provided with electric vehicle charge points	Completed in full (Conditions imposed on relevant applications prior to being superseded by Approved document S to expand scope within the Buildings Regulations. Planning conditions no longer required as a result and replaced with informative on development applications)
24.4	Cleaner transport	Implementation of a pilot for lamp post charging points, including £30K Local Implementation Plan investment match funded by Go Ultra Low City Scheme	A supplier of on street EV charging infrastructure will shortly be appointed to complete installations for trial period. In 2024/2025 GULCS funding will be superseded by LEVI funding from central Government
25.Provision of infrastructure to support walking and cycling and encourage mode shift away from private vehicle usage			
25.1	Cleaner transport	Development of new cycle routes, both as part of TfL's strategic cycle network and local routes	Design work is underway in developing two new Cycleways, between Kent House and Croydon and Kent House and Beckenham
25.2	Cleaner transport	Delivery of the 'Shortlands Friendly Village Scheme' to include schemes to reduce traffic volumes on residential streets to facilitate a safer and more inviting environment for walking and cycling.	Design work is underway in developing two new Cycleways, between Kent House and Croydon and Kent House and Beckenham
25.3	Cleaner transport	Delivery of area-based schemes that promote walking and reduce road danger, including a new footpath to Valley Primary School, a parallel zebra crossing outside Bishop Challoner School and a segregated cycle route in Albemarle Road and Beckenham Road to connect Shortlands with Beckenham, plus a cycle route in Valley Road to Harris Primary.	A new zebra crossing outside Harris Primary School will be installed in 2024 to help support walking to the school and walking from Shortlands to Bromley Town Centre via a railway footbridge. The cycle route along Valley Road was not able to be taken forward
25.4	Cleaner transport	Improve pedestrian safety- installation of new pedestrian crossings	2 crossings were installed at Station Road / Martin Road (zebra) and Upper Elmers End Road (new pedestrian refuge)
25.5	Cleaner transport	Improve pedestrian infrastructure to encourage walking to school	Court Road south - Existing crossing points improved; Court Road north - new refuge installed and Southborough Road - New footway construction
25.6	Cleaner transport	Provide high quality cycle hubs at stations and continue to deliver on-street cycle parking and Bike hangers	8 bike hangars were installed in 2023

3. Planning Update and Other New Sources of Emissions

Table M. Planning requirements met by planning applications in the London Borough of Bromley in 2023

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	21
Number of planning applications required to monitor for construction dust	92
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	106
Number of developments where an AQ Neutral building and/or transport assessments undertaken	21
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0*
Number of planning applications with S106 agreements including other requirements to improve air quality	0
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 Number of conditions related to NRMM included. Number of developments registered and compliant. Number of audits % Of sites unregistered prior to audit 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) Number of conditions related to NRMM included. Number of developments registered and compliant. Number of audits % Of sites unregistered prior to audit 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.	37

* All developments were air quality neutral. Where a couple of developments were not initially AQN, further mitigation introduced ensured standards were going to be met.

Bromley's Planning Department refer all applications that may have air quality impacts to the Pollution Control Team to assess, provide recommendations and suggested planning conditions. It is the decision of the planning officer as to whether the recommendations and conditions are applied.

Enforcement of NRMM is delivered via Bromley's membership of the Merton consortium which is match funded by the GLA.

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 Bromley Fleet

Two electric hatchback cars are in service within the Highways Division, two Plug-in hybrid Mayoral Cars are in service and one fully electric van has been in service in Public Protection & Enforcement since in 2021.

4.2 NRMM Enforcement Project

Bromley is an active member of the GLA Pan-London NRMM and will be continuing to support the NRMM Enforcement project in 2024 – 2025 through match funding.

Bromley has a standard NRMM condition for construction/demolition sites, which is worded as follows:

"All Non-Road Mobile Machinery (NRMM) of net power of 37kW and up to and including 560kW used during the course of the demolition, site preparation and construction phases shall comply with the emission standards set out in chapter 7 of the GLA's supplementary planning guidance "Control of Dust and Emissions During Construction and Demolition" dated July 2014 (SPG), or subsequent guidance. Unless it complies with the standards set out in the SPG, no NRMM shall be on site, at any time, whether in use or not, without the prior written consent of the local planning authority. The developer shall keep an up-to-date list of all NRMM used during the demolition, site preparation and construction phases of the development on the online register at https://nrmm.london/

Reason: The London Plan 2021 Policy SI 1 Improving air quality''

The wording is applied on the Decision Notice and the condition is applied to all relevant sites.

4.2 Air Quality Alerts

Bromley is a member of the AirTEXT consortium. At the end of 2023, we had 229 active subscribers.

The mayor's air quality alert messaging is sent directly to schools and hospitals in the Borough.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

During 2023, the Harwood Avenue station was operated by the London Borough of Bromley. QA/QC procedures involve a minimum monthly calibration visit and filter change when required by LB Bromley as the local site operator, and regular service checks by Matts Monitors. All data has been fully ratified according to Defra LAQM Technical Guidance standards. Ratification of data is undertaken by Imperial College in accordance with membership to the LLAQM.

A.2 Diffusion Tubes

Air proficiency testing (AIR-PT) is an independent analytical proficiency-testing scheme, operated by Laboratory of Government Chemists (LGC) Standards and supported by the Health and Safety Laboratory (HSL). AIR-PT is a scheme that has run from April 2014 to combine two long running PT schemes: LGC Standards Stack emission proficiency testing scheme and HSL Workplace Analysis Scheme for Proficiency scheme.

Gradko International participates in the AIR NO_2 PT scheme[3]. 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 Gradko International were overall satisfactory as stated here:

AR046 (September – October 2021) – 100%

AR049 (January – February 2022) – 100%

AR050 (May – June 2022) – 100%

AR052 (July – August 2022) – 100%

AR053 (September – October 2022) – 100%

AR055 (January – February 2023) – 100%

AR056 (May – June 2023) – 100%

[3] LGC (2023) Summary of Laboratory Performance in AIR NO_2 Proficiency Testing Scheme (September 2021 – October 2023) Available at: WASP – Annual Performance Criteria for NO2 Diffusion Tubes (defra.gov.uk) Accessed: 02/05/2024

AR058 (July – August 2023) - 100%

AR059 (September – October 2023) - 100%

Bias Adjustment

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

Factor from National Bias Adjustment

The national bias adjustment factor spreadsheet for 2023 is available from the Defra website. The results of multiple co-location studies are collated, and the average bias adjustment factor is taken for studies using the 20% TEA/water preparation method, analysed by Gradko. The national bias adjustment factor for 2023 version 3/24 is 0.81, based on 23 studies, using the LAQM national bias adjustment spreadsheet[4] which is shown in Figure 7.

Figure 7. National Bias Adjustment Factor Spreadsheet (v03/24)

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:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	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 a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	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)
Glasgow Scientific Services	20% TEA in water	2023		Overall Factor (1 study)				Use		0.74
Gradko	20% TEA in water	2023		Overall Factor[3] (23 studies)				Use		0.81

Discussion of Choice of Factor to Use

During 2023 there was only one diffusion tube co-located with the continuous monitoring at Harwood Avenue. Therefore, no local bias adjustment factor is available for 2023 due to the lack of co-location duplicate or triplicate sites. Therefore, the national bias adjustment factor of 0.81 (version 03/24) for the diffusion tube method 20% triethanolamine in water, analysed by Gradko was used.

[4] Defra (2024), LAQM, National bias adjustment factor spreadsheet. Available at: Database_Diffusion_Tube_Bias_Factors_v03_24-FINAL.xlsx (live.com) Accessed: 25/03//2024

Table N. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	National	03/24	0.81
2022	National	03/23	0.83
2021	National	03/22	0.84
2020	Local	-	0.82
2019	National	03/20	0.93
2018	National	03/19	0.93
2017	National	06/18	0.87
2016	National	03/17 v2	0.94
2015	National	06/16	0.88

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.

Distance Adjustment

The monitoring sites that have been bias adjusted and shown to be with 10% of the NO_2 annual objective of 40 µg m^{-3} (i.e., above 36 µg m^{-3}) or above should be accounted for the inherent uncertainty in diffusion tube monitoring concentration data as advised in the LAQM technical guidance produced by Defra (LAQM.TG(22)).

One site falls within the 10% of the NO_2 annual objective of 40 µg m^{-3} (DT19, High Street, Orpington) and is considered not representative of relevant exposure. The distance-corrected annual mean NO_2 concentration is shown below.

The local annual mean background concentrations in 2023 from the Defra 2018-based background maps[5] have been used for the calculation.

Table O presents the output from the NO_2 fall off with distance tool.

Table O. NO2 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})
19	2.7	6.2	38.8	14.5	31.5

[5] Defra (n.d.), Background Maps. Available at: Background Maps | LAQM (defra.gov.uk) Accessed: 01/03/2024

Appendix B Full Monthly Diffusion Tube Results for 2023

Table P. NO_2 2023 Diffusion Tube Results ($\mu g/m^3$)

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 < (x.x)>	Annual Mean: Distance Corrected to Nearest Exposure
1	541047	168231	37.3	**40.7**	28.0	30.1	30.5	27.9	24.6	26.1	29.3	27.1	34.2	22.6	29.9	24.2	-
2	541679	167931	28.7	25.3	18.9	18.1	14.5	13.8	12.5	14.2	17.5	18.6	22.5	15.0	18.3	14.8	-
3	542402	166012	35.6	38.6	28.9	30.1	29.9	28.3	25.4	25.6	29.4	29.2	32.7	23.4	29.8	24.1	-
4	540336	170258	33.0	34.1	27.5	29.2	28.2	26.4	20.9	24.3	32.1	29.4	31.9	23.6	28.4	23.0	-
5	539790	170050	31.7	36.2	25.5	28.3	27.4		18.5		30.5	28.1	31.5	19.1	27.7	22.4	-
6	539486	169399	34.0	34.5	26.4	27.7	22.9	25.8	23.6	23.2	28.7	30.4	32.0	23.0	27.7	22.4	-
7	535947	169765	36.6	39.3		32.8	29.6	30.5	23.2	29.2	33.1	34.3	34.9	25.6	31.7	25.7	-
8	536941	171320	34.0	32.5	22.5	21.9	20.2	18.8	14.7	16.8		20.5	23.7	15.9	22.0	17.8	-
9	537511	167277	33.4	35.8	27.2	29.7	24.8	25.7	22.2	23.4	27.4	26.7	28.6	19.3	27.0	21.9	-
10	536076	168434	**48.6**	**48.4**	36.6	39.8	37.1	37.8	34.4	36.3	**42.2**	36.4	39.1	30.8	39.0	31.6	-
11	535006	169590	34.7	38.1	29.6	32.4	27.9	28.5	24.4	25.1	34.7	32.9	31.7	23.2	30.3	24.5	-

12	533949	170624	**44.9**	**43.7**		34.1	33.5	36.2	33.7	35.0	**40.3**	**40.1**	36.8	31.3	37.2	30.2	-
13	534052	170237	35.7	38.3	28.3	32.3	31.3	29.8	20.0	22.1	31.5	26.7	29.4	21.9	28.9	23.4	-
14	533702	170354	27.9	26.6	17.8	17.5	15.7	15.0	11.6	13.2	17.1	19.2	22.2	14.8	18.2	14.8	-
15	538398	165925	38.8	36.2	30.6	28.3	23.2	25.6	25.4	24.5	28.6	29.0	31.2	24.7	28.8	23.4	-
16	540228	165941	24.2	21.5	15.0	15.0	12.3	12.6	10.6	12.4	13.0	14.7	19.5	14.4	15.4	12.5	-
17	543303	165256	37.3	36.7	28.4	27.6	25.6	25.2	24.6	26.9	29.3	29.8	30.5	24.2	28.8	23.4	-
18	544779	166831	20.9	21.8	14.4	18.8	16.7	15.3	8.8	11.8	16.7	15.2	18.5	10.4	15.8	12.8	-
19	546190	166135	**50.6**	**53.2**	**47.2**	**40.9**	**40.5**	**42.1**	**48.5**	**45.1**	**51.3**	**58.0**	**51.4**	**45.2**	**47.8**	38.8	31.5
20	545861	164813	26.5	26.8	18.1	20.0	18.2	17.1	14.8	16.3	19.4	20.7	24.0	15.7	19.8	16.0	-
21	545439	164034	33.1	35.2	34.3	30.3	31.2	34.3	33.4	33.1	37.3	39.2	37.2	27.9	33.9	27.4	-
22	546821	167564	25.9	28.1	19.6	23.7	20.7	21.0	12.8		22.8	21.2	23.0		21.9	17.7	-
23	547168	167471	34.5	33.2	27.5	24.7	22.5	22.6	23.7	26.0	24.9	29.6	30.1	22.7	26.8	21.7	-
24	546984	169905	31.2	32.1	22.7	25.4	23.9	23.1	16.4	19.5	25.3	25.4	27.1	18.0	24.2	19.6	-
25	544437	170464	27.4	26.3	18.3	18.5	16.6	16.3	12.6	13.9	19.2	19.5	21.5	14.5	18.7	15.2	-
26	543930	170934		26.8	18.9	20.9	18.8	18.0	13.1	19.6	21.1	23.1	24.2	16.2	20.1	16.2	-
27	540525	169325	30.8	29.9	24.3	20.7	18.3	17.1	20.4	22.9	23.5	26.2	28.3	24.5	23.9	19.4	-
28	540519	169403	**42.7**	**42.6**	36.9		33.0	32.1	28.9	33.4	36.0	35.6	**40.6**	29.2	35.6	28.8	-
29	542980	167735		25.3	23.4	24.5	22.1	23.5	18.8	19.0	22.4	22.5	24.1	15.5	21.9	17.8	-
30	543452	169793	32.9	32.7	22.7	26.4	24.4	24.5	18.4	20.0	27.3	26.5	26.7	20.2	25.2	20.4	-

31	542847	172021	39.6	39.0	26.8	30.9	25.6	27.7	24.4	26.5	31.3	33.2	32.6	26.2	30.3	24.6	-
32	541960	168841	33.7	35.2	25.5	29.0	25.0	24.9	18.6	21.9	24.2	27.5	29.6	20.8	26.3	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.**

☒ **The London Borough of Bromley 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 A for details on bias adjustment and annualisation.

Appendix C Annual Mean NO_2 Ratified, Bias-adjusted and Distance adjusted Monitoring Results 2017-2023

Site ID	Site type	2017	2018	2019	2020	2021	2022	2023
BRY-CM3	Automatic	28.6	25.7	24.7	21.3	21.8	20.1	19.0
1	Diffusion tube	**54.3**	**43.5**	39.4	29.3	30.9	28.6	24.2
2	Diffusion tube	-	-	-	-	18.3	18.1	14.8
3	Diffusion tube	-	-	-	-	27.5	27.6	24.1
4	Diffusion tube	36.4	35.6	33.1	25.7	25.5	25.6	23.0
5	Diffusion tube	**43.3**	37.6	37.6	27.7	26.8	24.6	22.4
6	Diffusion tube	37.3	35.3	36.0	27.7	27.1	25.4	22.4
7	Diffusion tube	38.0	38.2	36.0	28.6	30.2	28.8	25.7
8	Diffusion tube	-	-	-	-	20.6	20.0	17.8
9	Diffusion tube	-	-	-	-	25.4	24.6	21.9
10	Diffusion tube	**59.5**	**51.3**	**48.1**	39.5	37.5	35.4	31.6
11	Diffusion tube	38.2	35.2	36.4	27.9	29.2	26.3	24.5
12	Diffusion tube	**41.6**	39.0	**42.5**	35.1	35.9	36.2	30.2
13	Diffusion tube	-	-	-	-	26.6	26.0	23.4
14	Diffusion tube	-	-	-	-	18.2	16.5	14.8
15	Diffusion tube	-	-	-	-	27.9	27.9	23.4
16	Diffusion tube	-	-	-	-	16.2	15.3	12.5
17	Diffusion tube	-	-	-	-	25.0	25.7	23.4
18	Diffusion tube	-	-	-	-	15.4	14.6	12.8
19	Diffusion tube	-	-	-	-	35.0	33.9	31.5
20	Diffusion tube	-	-	-	-	19.4	18.3	16.0
21	Diffusion tube	-	-	-	-	33.3	30.5	27.4
22	Diffusion tube	-	-	-	-	22.4	19.8	17.7
23	Diffusion tube	-	-	-	-	25.1	23.7	21.7
24	Diffusion tube	-	-	-	-	24.7	24.0	19.6
25	Diffusion tube	-	-	-	-	19.6	18.9	15.2
26	Diffusion tube	-	-	-	-	21.0	19.8	16.2
27	Diffusion tube	30.3	27.3	28.3	21.4	21.1	20.5	19.4
28	Diffusion tube	**43.4**	39.1	38.4	30.9	32.8	31.1	28.8
29	Diffusion tube	-	-	-	-	23.0	21.5	17.8
30	Diffusion tube	-	-	-	-	26.6	23.3	20.4
31	Diffusion tube	-	-	-	-	29.7	26.4	24.6
32	Diffusion tube	-	-	-	-	25.3	23.9	21.3

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 more than 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%.

Results have been distance corrected where applicable.

(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 were carried out for six months the maximum data capture for the full calendar year would be 50%).

Appendix D Map of Monitoring Locations and AQMA

The monitoring site numbers indicated on the map below correlate to the Diffusion Tube Identification numbers listed in Table C.