

London Borough of Bromley

Air Quality Annual Status Report for 2022

Date of publication: May 2023



This report provides a detailed overview of air quality in London Borough of Bromley during 2022. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process¹.

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

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Abbreviations

Abbreviation	Description
AQA	Air Quality Assessment
AQAP	Air Quality Action Plan
AQFA	Air Quality Focus Area
AQMA	Air Quality Management Area
AQN	Air Quality Network
AQO	Air Quality Objective
ASR	Annual Status Report
BAM	Beta Attenuation Monitor
BIDs	Business Improvement Districts
BRY-CM3	Bromley Continuous Monitoring Site 3
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CEO	Civil Enforcement Officer
CIL	Community Infrastructure Levy
CoCP	Code of Construction Practice
DC	Dry Cleaners
EV	Electric Vehicle
FORS	Fleet Operator Recognition Scheme
GLA	Greater London Authority
GULCS	Go Ultra Low City Scheme
HEYL	London Healthy Early Years
HGV	Heavy Goods Vehicle
JSNA	Joint Strategic Needs Assessment
LAQM	Local Air Quality Management
LAQN	London Air Quality Network
LBB	London Borough of Bromley
LEN	Low Emission Neighbourhood
LIP	Local Implementation Plan
LLAQM	London Local Air Quality Management
NO ₂	Nitrogen dioxide
NRMM	Non-Road Mobile Machinery

Abbreviation	Description
PCN	Penalty Charge Notice
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/Quality Control
PVR	Petrol Vapour Recovery
SCA	Smoke Control Area
SCO	Smoke Control Order
SO ₂	Sulphur dioxide
SPG	Supplementary Planning Guidance
STARS	Sustainable Travel: Active, Responsible, Safe
TfL	Transport for London
TMO	Traffic Management Order

Table A. Summary of National Air Quality Standards and Objectives

Pollutant	Standard / Objective (UK)	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
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)	40 µg m ⁻³	Annual mean	31 Dec 2004
Particles (PM _{2.5})	10 µg m ⁻³	Annual mean	2040
Particles (PM _{2.5})	Target of 35% reduction in population exposure compared to a base year of 2018 ⁽²⁾	Annual mean	2040
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 not to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

Notes:

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

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

1. Air Quality Monitoring

1.1 Locations

The London Borough of Bromley has historically monitored at six continuous monitoring sites within the Borough, five of which are now closed. The one operational monitoring station is located at Harwood Avenue, monitoring NO₂, PM₁₀ and PM_{2.5}. Figure 1 and Table B 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 NO₂ 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. Figure 1 and Table C provide details of the operational diffusion tube sites within the Borough during 2022.

Table B. Details of Automatic Monitoring Sites for 2022

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
BRY-CM3	Harwood Avenue	540523	169326	Roadside	Y	0.0	3.0	3.5	NO ₂ , PM _{2.5} and PM ₁₀	Chemiluminescence, Beta attenuation monitoring (BAM)

Table C. Details of Non-Automatic Monitoring Sites for 2022

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
1	Homesdale Road	541047	168231	Roadside	Y	2.0	2.0	2.0	NO ₂	N
2	Chatterton Road	541679	167931	Roadside	Y	3.3	2.0	2.0	NO ₂	N
3	Hastings Road,	542402	166012	Kerbside	Y	10.0**	0.8	2.0	NO ₂	N
4	College Road	540336	170258	Roadside	Y	3.0	3.0	2.0	NO ₂	N
5	London Road	539790	170050	Roadside	Y	4.0	2.0	2.0	NO ₂	N
6	Shortlands Road	539486	169399	Roadside	Y	5.3	1.2	2.0	NO ₂	N
7	Beckenham Road	535947	169765	Kerbside	Y	10.0**	0.5	2.0	NO ₂	N
8	Worsley Bridge Road	536941	171320	Kerbside	Y	6.0	0.8	2.0	NO ₂	N
9	Links Way	537511	167277	Kerbside	Y	9.5	0.8	2.0	NO ₂	N
10	Elmers End Road	536076	168434	Roadside	Y	4.0	1.0	2.0	NO ₂	N
11	Anerley Road	535006	169590	Kerbside	Y	3.0	0.5	2.0	NO ₂	N
12	Anerley Hill	533949	170624	Kerbside	Y	13.0**	0.5	2.0	NO ₂	N
13	Hamlet Road	534052	170237	Kerbside	Y	8.5	0.5	2.0	NO ₂	N
14	Belverdere Road	533702	170354	Kerbside	Y	8.5	0.5	2.0	NO ₂	N
15	Glebe Way	538398	165925	Kerbside	Y	8.0	0.8	2.0	NO ₂	N
16	Ridgeway	540228	165941	Kerbside	Y	10.0	0.5	2.0	NO ₂	N
17	Crofton Road	543303	165256	Kerbside	Y	7.2**	0.6	2.0	NO ₂	N
18	Towncourt Lane	544779	166831	Roadside	Y	7.0**	2.6	2.0	NO ₂	N

19	High Street, Orpington	546190	166135	Roadside	Y	3.8	1.7	2.0	NO ₂	N
20	Cardinham Road	545861	164813	Roadside	Y	4.5	1.8	2.0	NO ₂	N
21	Farnborough Hill	545439	164034	Kerbside	Y	8.8	0.6	2.0	NO ₂	N
22	Poverest Road	546821	167564	Kerbside	Y	3.1	1.3	2.0	NO ₂	N
23	High Street, St Mary Cray	547168	167471	Roadside	Y	3.3	1.4	2.0	NO ₂	N
24	Midfield Way	546984	169905	Kerbside	Y	17.5	0.6	2.0	NO ₂	N
25	Ashfield Lane	544437	170464	Roadside	Y	10.0	1.8	2.0	NO ₂	N
26	Park Road	543930	170934	Roadside	Y	2.4	0.8	2.0	NO ₂	N
27	Harwood Avenue	540525	169325	Roadside	Y	0*	3.0	2.0	NO ₂	Y
28	Widmore Road	540519	169403	Roadside	Y	0*	3.0	2.0	NO ₂	N
29	Blackbrook Lane	542980	167735	Roadside	Y	12.0	1.7	2.0	NO ₂	N
30	Old Hill	543452	169793	Kerbside	Y	6.1	0.3	2.0	NO ₂	N
31	Mottingham Road	542847	172021	Roadside	Y	0*	2.1	2.0	NO ₂	N
32	Page Heath Lane	541960	168841	Kerbside	Y	1.8	0.4	2.0	NO ₂	N

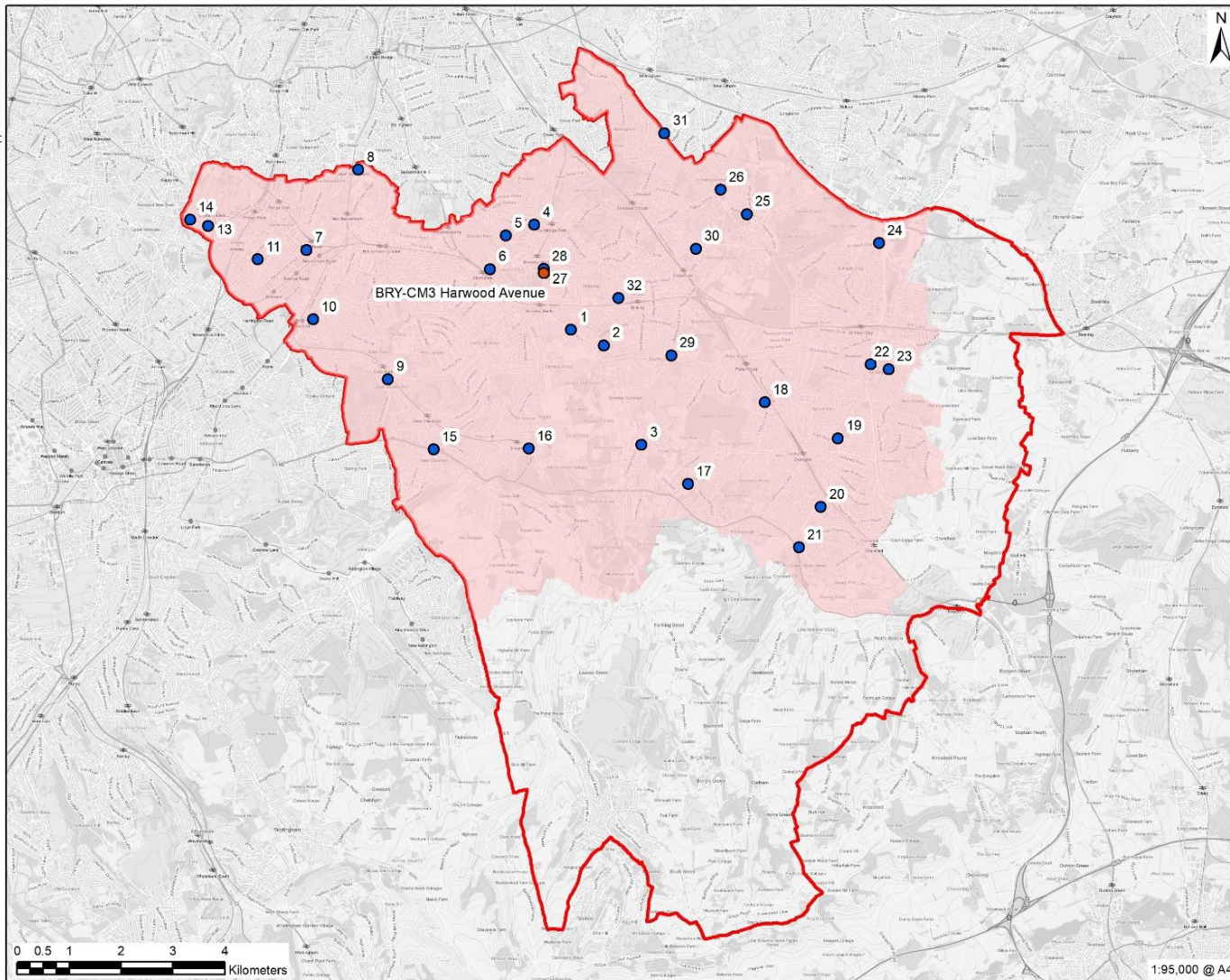
Notes:

* not directly on a façade, but representative of adjacent façade road distance

** monitoring site closer to the road source than the nearest façade

Figure 1. Monitoring Sites in 2022

Revision: No. 1 Drawn: VM Checked: CM Approved: AS Date: 18/05/2023



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London Borough of Bromley
Annual Status Report

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LEGEND
2022
Automatic Monitoring Locations
2022 Diffusion Tube Monitoring Locations
Air Quality Management Area
London Borough of Bromley

NOTES
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ISSUE PURPOSE
FINAL
PROJECT NUMBER
60483865
SHEET TITLE
Map of Monitoring Locations

SHEET NUMBER
Figure 1

1. 2 Comparison of Monitoring Results with AQOs

Annual mean NO₂ concentration results from automatic monitoring stations and diffusion tube monitoring locations since 2016 are presented in Table D and Figures 2 and 3. 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.

The BRY-CM3 Harwood Avenue automatic monitor achieved a 99.2% data capture and did not exceed the NO₂ annual mean objective of 40 µg m⁻³. Table E presents the number of 1-Hour means where they are more than 200 µg m⁻³; no exceedances were recorded in 2022. All data have been ratified, and details of the data ratification process are provided in Appendix A.

Diffusion tube monitoring results presented are after adjustments for “annualisation” of sites that achieved less than 75% data capture in 2022, and following adjustments for bias, the details of which are described in Appendix A. As the data capture for the diffusion tubes were 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 Tool² has been used to estimate the annual mean NO₂ concentrations at the nearest location of relevant exposure (see Appendix A).

Of the diffusion tube monitoring locations, there was one exceedance of the annual mean NO₂ objective in 2022 at diffusion tube 19, High Street, Orpington, with a concentration of 40.6 µg m⁻³, the maximum annual mean concentration recorded. Following distance correction for a location of relevant exposure, the predicted concentration was 33.9 µg m⁻³. 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 NO₂ objective is unlikely being exceeded.

² Defra (2023), Diffusion Tube Data Processing Tool. Available at: [Diffusion Tube Data Processing Tool | LAQM \(defra.gov.uk\)](https://www.gov.uk/guidance/diffusion-tube-data-processing-tool) Accessed 19/05/2023

Table D. Annual Mean NO₂ Ratified and Bias-adjusted Monitoring Results

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022	Trend in NO ₂ level
BRY-CM3	Automatic	99.2	99.2	31.9	28.6	25.7	24.7	21.3	21.8	20.1	↓
1	Diffusion tube	100.0	100.0	63.3	54.3	43.5	39.4	29.3	30.9	28.6	↓
2	Diffusion tube	100.0	100.0	-	-	-	-	-	18.3	18.1	↓
3	Diffusion tube	100.0	100.0	-	-	-	-	-	27.5	27.6	↑
4	Diffusion tube	92.3	92.3	46.8	36.4	35.6	33.1	25.7	25.5	25.6	↑
5	Diffusion tube	82.6	82.6	52.4	43.3	37.6	37.6	27.7	26.8	24.6	↓
6	Diffusion tube	100.0	100.0	-	37.3	35.3	36.0	27.7	27.1	25.4	↓
7	Diffusion tube	100.0	100.0	47.9	38.0	38.2	36.0	28.6	30.2	28.8	↓
8	Diffusion tube	100.0	100.0	-	-	-	-	-	20.6	20.0	↓
9	Diffusion tube	100.0	100.0	-	-	-	-	-	25.4	24.6	↓
10	Diffusion tube	100.0	100.0	68.8	59.5	51.3	48.1	39.5	37.5	35.4	↓
11	Diffusion tube	100.0	100.0	47.9	38.2	35.2	36.4	27.9	29.2	26.3	↓
12	Diffusion tube	100.0	100.0	49.6	41.6	39.0	42.5	35.1	35.9	36.2	↑
13	Diffusion tube	100.0	100.0	-	-	-	-	-	26.6	26.0	↓
14	Diffusion tube	92.3	92.3	-	-	-	-	-	18.2	16.5	↓
15	Diffusion tube	100.0	100.0	-	-	-	-	-	27.9	27.9	-
16	Diffusion tube	90.4	90.4	-	-	-	-	-	16.2	15.3	↓
17	Diffusion tube	92.6	92.6	-	-	-	-	-	25.0	25.7	↑
18	Diffusion tube	82.6	82.6	-	-	-	-	-	15.4	14.6	↓
19	Diffusion tube	100.0	100.0	-	-	-	-	-	35.0	33.9	↓
20	Diffusion tube	77.1	77.1	-	-	-	-	-	19.4	18.3	↓
21	Diffusion tube	100.0	100.0	-	-	-	-	-	33.3	30.5	↓

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022	Trend in NO ₂ level
22	Diffusion tube	100.0	100.0	-	-	-	-	-	22.4	19.8	↓
23	Diffusion tube	90.4	90.4	-	-	-	-	-	25.1	23.7	↓
24	Diffusion tube	92.3	92.3	-	-	-	-	-	24.7	24.0	↓
25	Diffusion tube	92.3	92.3	-	-	-	-	-	19.6	18.9	↓
26	Diffusion tube	100.0	100.0	-	-	-	-	-	21.0	19.8	↓
27	Diffusion tube	100.0	100.0	31.3	30.3	27.3	28.3	21.4	21.1	20.5	↓
28	Diffusion tube	92.3	92.3	50.9	43.4	39.1	38.4	30.9	32.8	31.1	↓
29	Diffusion tube	100.0	100.0	-	-	-	-	-	23.0	21.5	↓
30	Diffusion tube	100.0	100.0	-	-	-	-	-	26.6	23.3	↓
31	Diffusion tube	100.0	100.0	-	-	-	-	-	29.7	26.4	↓
32	Diffusion tube	100.0	100.0	-	-	-	-	-	25.3	23.9	↓

Notes:

The annual mean concentrations are presented as $\mu\text{g m}^{-3}$.

Exceedances of the NO₂ annual mean AQO of $40 \mu\text{g m}^{-3}$ are shown in **bold**.

NO₂ annual means in excess of $60 \mu\text{g m}^{-3}$, indicating a potential exceedance of the NO₂ 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 was carried out for six months the maximum data capture for the full calendar year would be 50%).

Table E.

NO₂ 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 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
BRY-CM3	99.2	99.2	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 NO₂ 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%)

Figure 2 below shows the trend in annual mean NO₂ concentration at BRY-CM3 Harwood Avenue Automatic Monitor for the 2016 – 2022 period. This location shows an overall decreasing trend after a slight increase from 2020 to 2021. From 2021 to 2022 NO₂ concentrations decreased by 1.7 μg m⁻³.

Figure 2. Annual Mean NO₂ Concentrations at the Harwood Avenue Automatic Monitoring Site

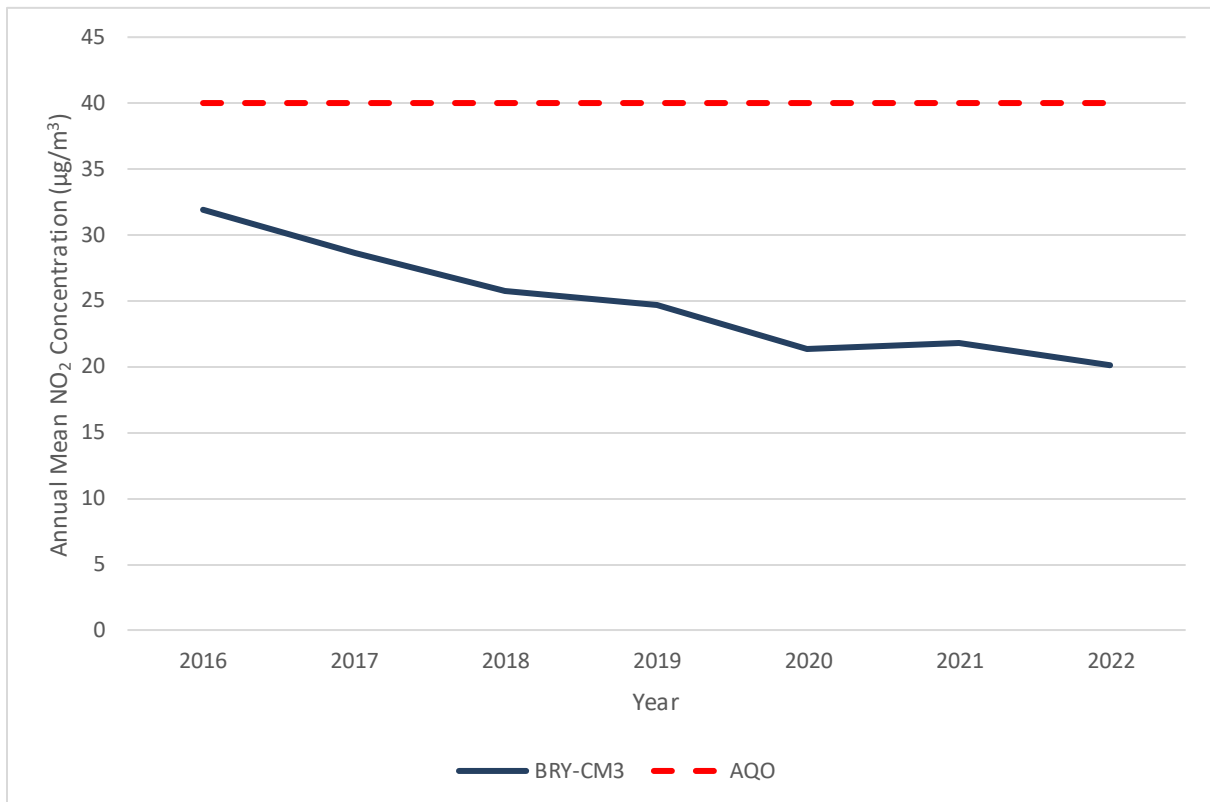


Figure 3 below shows the trends in annual mean NO₂ concentrations for the original 10 non-automatic monitoring sites referred to on Page 8 for the 2016 – 2022 period. There is only data available for 2021 and 2022 for the additional 22 diffusion tube sites installed in 2021 and this is not sufficient to graphically represent NO₂ trends at this time. Please refer to Table D for full results.

Figure 3. Annual Mean NO₂ concentrations for the original 10 Non-Automatic Monitoring Sites

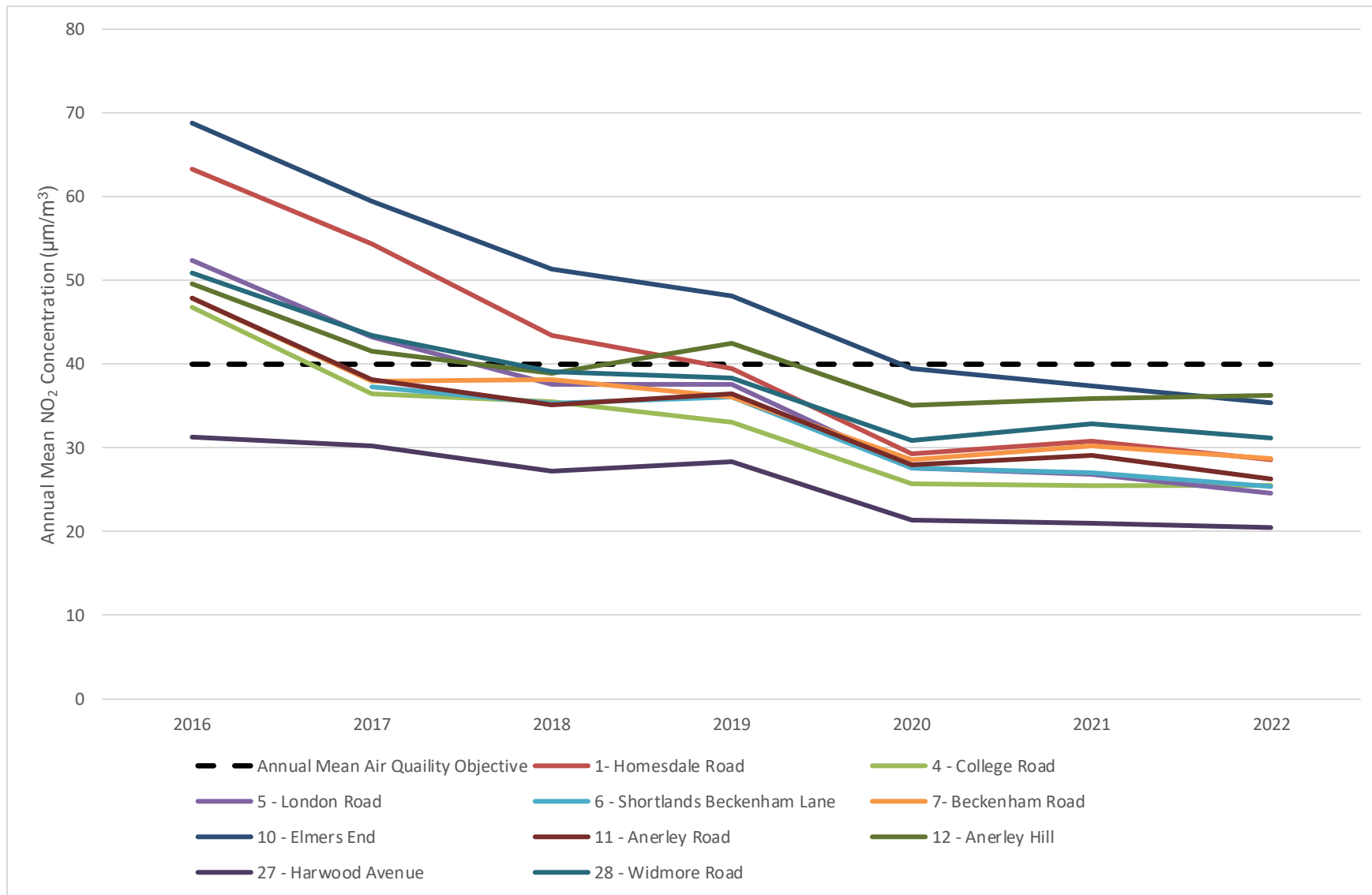


Table D demonstrates that the majority of diffusion tube sites show evidence for a decrease in NO₂ concentrations from the start of their monitoring period to 2022. The highest decrease in NO₂ concentrations of 3.3µg m⁻³ was observed at site 30, Old Hill, and site 31, Mottingham Road from 2021 to 2022. Site 12, Anerley Hill, and site 17, Crofton Road, show the highest increase in NO₂ concentrations of up to 1.0µg m⁻³ compared to 2021. All but one diffusion tube was below the AQO in 2022.

Diffusion tube site 19, High Street, Orpington, exceeded the AQO of 40µg m⁻³ with a concentration of 40.6 µg m⁻³, however, following distance correction for a location of relevant exposure, the predicted concentration was 33.9µg m⁻³. Site 19 had a decrease in NO₂ concentration of 1.1µg m⁻³ compared to 2021. In 2021, site 19 recorded NO₂ concentration of 41.9µg m⁻³, however after distance correction, the concentration was predicted to be 35µg m⁻³.

In general, it appears that there was a significant reduction in NO₂ concentrations during the Covid-19 pandemic restrictions in 2020. Since then, NO₂ concentrations have increased slightly from these low levels, however, they have not returned to pre-pandemic levels.

Overall, NO₂ concentrations observed in 2022 were very similar to those of 2021 with small reductions across most sites but marginal increases at four locations. The longer term trend from 2016 to 2022 indicates that the NO₂ concentrations have reduced when compared to 2016 concentration.

The Council has been monitoring PM₁₀ within the Borough since October 1999. The only operational monitoring station is at Harwood Avenue. A Beta Attenuation Monitor (BAM) is used for monitoring PM₁₀. The annual mean PM₁₀ results are shown in Table F and the 24-hour mean PM₁₀ results are presented in Table G. Data capture at the site in 2022 was 97.1%. The annual mean PM₁₀ concentration in 2022 was 14.7 µg m⁻³, which is below the annual mean objective of 40 µg m⁻³. There were no days where the average concentration was above the 24-hour mean air quality objective value of 50 µg m⁻³ (Table G).

Figure 4 shows there was a decline in the PM₁₀ annual mean concentration between 2016 and 2018, with a small increase between 2018 and 2019, then declining again from 2019 to 2022.

Table F. Annual Mean PM₁₀ Automatic Monitoring Results (µg m⁻³)

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
BRY-CM3	97.1	97.1	29.5	16.8	16.5	18.8	15.8	15.4	14.7

Notes:

The annual mean concentrations are presented as µg m⁻³.

Exceedances of the PM₁₀ 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 G. PM₁₀ Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM₁₀ 24-Hour Means > 50 µg m⁻³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020	2021	2022
BRY-CM3	97.1	97.1	4(45)	2(30)	0(26)	8	1	0	0

Notes:

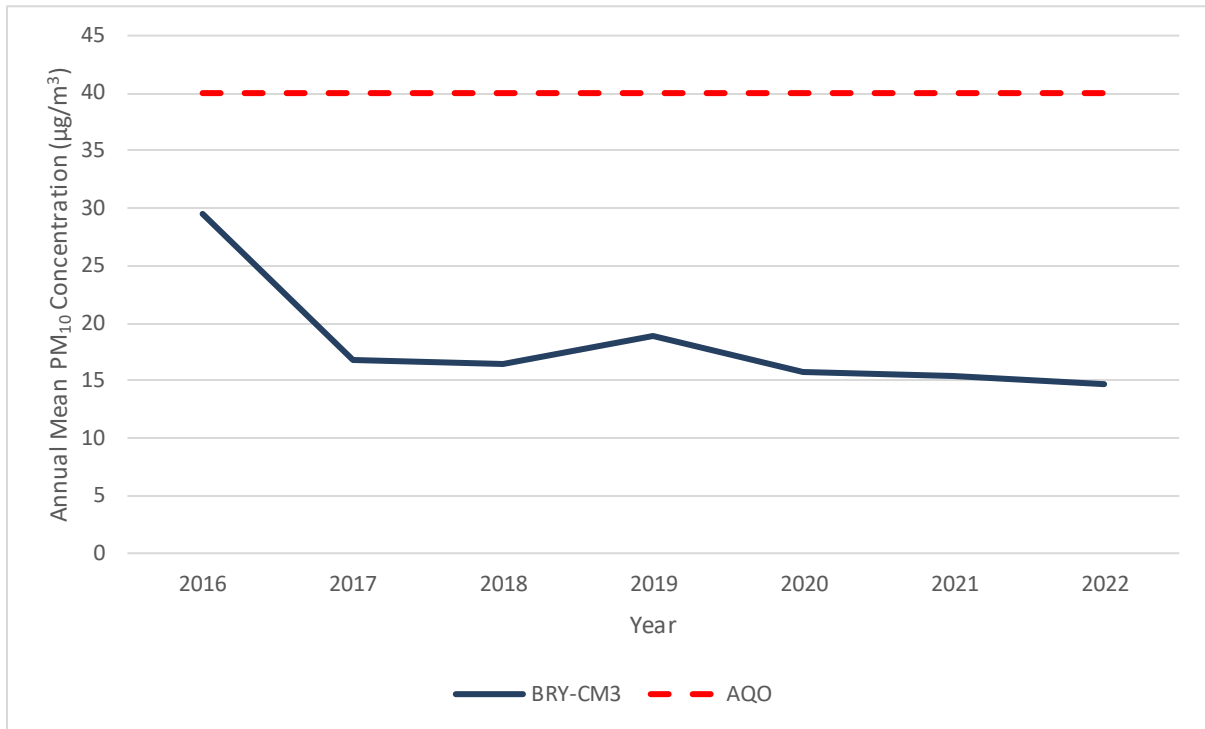
Exceedances of the PM₁₀ 24-hour mean objective (50 µg m⁻³ over the permitted 35 days per year) are shown in **bold**.

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 4. Annual Mean PM10 Concentrations at Harwood Avenue Automatic Monitoring Site



In 2015, an inlet particle sensor was attached to the PM₁₀ 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 2022 are shown in Table H; all data previous of 2020 presented in Table H were collected using the inlet sensor therefore any trends should be indicative. The annual mean PM_{2.5} concentration in 2022 was 10.6 µg/m³ which is below the annual mean objective of 20 µg/m³; data capture in 2022 was 96.8%.

Table H. Annual Mean PM_{2.5} Automatic Monitoring Results ($\mu\text{g m}^{-3}$)

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	2016	2017	2018	2019	2020 ^(c)	2021 ^(d)	2022
BRY-CM3	96.8	96.8	15.5	-	-	-	8.5	9.7	10.6

Notes:

The annual mean concentrations are presented as $\mu\text{g m}^{-3}$.

Exceedances of the PM_{2.5} annual mean AQO of $20 \mu\text{g m}^{-3}$ 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%).

(c) Valid data capture for 2020 was 56%.

(d) Valid data capture for 2021 was 88%.

Annual mean concentrations have increased between 2020 and 2022. It should be noted that the PM_{2.5} data capture in 2020 and 2021 is below the valid data capture requirement of 90% to be used as part of the London Air Quality Network. This is largely due to the monitors installation in 2020 and technical issues resulting in periods of down time.

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 set an annual mean target level for PM_{2.5} of $10 \mu\text{g m}^{-3}$ to be met by 31st December 2040.

1.3 Air Quality Sensors

The Council are supporting Breathe London with five monitors. Table I shows a list of the monitors with the annual mean of NO₂ and PM_{2.5} in 2022. 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 I. Annual mean of NO₂ and PM_{2.5} of the Breathe London Nodes within London Borough of Bromley (µg m⁻³)

Node Name	Valid data capture 2022 % ^(a)	Valid data capture for operational period in year 2022 % ^(b)	NO ₂		PM _{2.5}	
			2021	2022	2021	2022
Beckenham Beacon Hospital	35	100	-	26.8	-	7.8
Bethlam Royal Hospital	45	100	-	22.9	-	8.1
Orpington Hospital	58	99.3	-	23.3	-	7.7
Poverest Allotment	99	99	26.2	23.8	9.3	8.2
Princess Royal Hospital	99	99.8	22.1	22.2	10.7	10.0

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 was 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. Poverest allotment and Princess Royal Hospital sites have been operational throughout 2022.

2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

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

Table J. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	Progress
1.1	Monitoring and other core statutory duties	Ongoing maintenance of the Harwood Ave air quality monitoring station (AQMS) (%) Target: data capture over 90%	Achieved in 2022. 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	Ongoing
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	Ongoing
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 2022 (Keeping up to date on progress and research:

Measure	LLAQM Action Matrix Theme	Action	Progress
			www.researchgate.net/publication/335466076_Review_of_the_Performance_of_Low-Cost_Sensors_for_Air_Quality_Monitoring . Installed an AQ sensor as part of Breathe London at the Princess Royal Hospital, Beckenham Beacon Hospital, Bethlam Royal Hospital, Orpington Hospital and Poverest Allotment (see chapter 1.3). The research is ongoing.
1.8	Monitoring and other core statutory duties	Continue to support major developers in siting and installing construction site dust monitors Advice given through planning consultation system. Outputs – number of planning conditions /reports provided. Reported annually in the Annual Status Report (ASR)	Completed for 2022 (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.	Completed for 2021 (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.
2.1	Emissions from developments and buildings	Require Construction Environmental Management Plans for 100% of major developments where works are likely to produce levels of dust (%) Target:	Completed for 2022.
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.
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)	London Borough of Bromley has adopted the GLA CoCP documents as its own CoCP

Measure	LLAQM Action Matrix Theme	Action	Progress
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 in the near future)
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).
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	Completed for 2022 (Conditions imposed on relevant applications. GIS layer of all AQFAs put on STATMap, where planners can view for new 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 2022
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.	Completed for 2022 Number of applications where AQ assessment: 16 Number of planning apps required to monitor for dust: 48 Number of developments required to install ultra low NOx boilers : 73 Number of Neutral building and/or transport assessments undertaken: 16 Planning applications conditions for NRMM: 32 Planning applications conditioned for EV: 13
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 - completed for 2022
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	Completed for 2022 (Provided an updated list of Major Planning sites where construction is starting or soon to start to NRMM Project Team

Measure	LLAQM Action Matrix Theme	Action	Progress
		appropriate, and compliance with GLA NRMM requirements	for inspection. 25 Audits carried out in 2022. Follow up action was taken on one non-compliant site with equipment removed from site)
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.	Completed for 2022
4.2	Emissions from developments and buildings	Require developers to meet the GLA's emissions limits for CHP and Biomass boilers	Completed for 2022
4.3	Emissions from developments and buildings	Set requirement for evidence of maintenance of CHP and associated plant	Completed for 2022
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 2022
5.2	Emissions from developments and buildings	Set requirement for evidence of maintenance of CHP and associated plant	Completed for 2022
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	Completed for 2022
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)
7.1	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	Ongoing (The Council will utilise publications such as 'Environment Matters' to provide advice here)

Measure	LLAQM Action Matrix Theme	Action	Progress
		'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.	
7.2	Emissions from developments and buildings	Effectively fulfil statutory duties as a Smoke Control Area (SCA)	Completed for 2022 (100% response to SCA related complaints. 5 of 5 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 SCO)
7.3	Emissions from developments and buildings	Continue to control emissions from permitted processes through inspections and enforcement (see also action 1)	Completed for 2022 (All DC and PVR sites requiring an inspection compliant with permit conditions. Other LAPPC activities not inspected in year 2022 due to staff resourcing)
8.1	Emissions from developments and buildings	Promoting and delivering energy efficiency retrofitting projects in workplaces and homes	ECO Flex declarations commenced in 2017. The projected figure for Bromley in 2019/20 is 12 declarations covering 53 households with an escalation year on year. Target: 5% minimum increase annually. Ongoing
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	Ongoing
8.3	Emissions from developments and buildings	Continue with the advice service for households at risk of fuel poverty in south east London. Target- to carry out 800 home visits and 800 one-to-one advice sessions at events	Completed for 2022 (164 home visits have been conducted. The Council is awaiting a project report on the impact that these visits have had on fuel poverty and this will be used to determine how to best support residents going forward.)
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	Ongoing
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	Completed for 2022 (Pipeline projects were initially identified and scoped to make use of the decarbonisation loan scheme from Salix, including an option for LED and solar panels to complement the work to replace the district heating system. Following completion of the Operational Property Review, the Operational Property Repair

Measure	LLAQM Action Matrix Theme	Action	Progress
			Programme has been established, with this Board considering priorities for decarbonisation as part of the programme.)
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.	Completed for 2022 (A contract has been awarded to CO2Analysis to undertake a scope 3 carbon foot printing exercise for the council's procurement emissions. An understanding of the emissions generated by the council's purchased goods and services will support Bromley's Sustainable Procurement policy which is in place to ensure that the environmental impact of LBB's procured services is considered in the tendering process, and target work with specific contracts to have the most significant impact on reducing carbon emissions.)
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 take into account 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	Completed for 2022 (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.)
9.1	Emissions from developments and buildings	Update ASR and planning portal	Ongoing
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
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)	Completed for 2022 (In 21/22 we have delivered 11 Dr Bike Sessions and have delivered cycle training to 113 adults. Unfortunately, due to a lack of funding TfL were unable to continue to provide the Healthy Streets Officer who was responsible for business engagement. The Road Safety Team will continue to promote their services to businesses in the borough.)

Measure	LLAQM Action Matrix Theme	Action	Progress
12.1	Public health and awareness raising	Public Health team to support promotion through GP practices and pharmacies Membership of airTEXT consortium	Completed for 2022. (ICS respiratory group is involved, revisions and updates to airTEXT platform planned for 2025. Another Digital health app for patients with Asthma and allergies being rolled out. At the end of 2022 Bromley had 200 active subscribers to airTEXT, which was a net increase of 18 on the previous year. There were 22 alert days in Bromley in 2022, and 2,569 alert messages were sent by text, email or voicemail.)
13.1	Public health and awareness raising.	Use of the STARS programme in schools as a tool to promoting active travel to school	Completed for 2022 (In 21/22 71 % of schools have an active Travel Plan. 11 Bronze, 12 Silver and 59 Gold. This gives us a quality score of 212)
14.1	Public health and awareness raising	Ongoing co-ordination of the Healthy 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.	Ongoing HEYL: only one silver award and one gold award were given this year in Bromley. Both the HSL and the HEYL scheme are currently being reviewed by the GLA in 2023 HEYL bronze award (and above) include whether the Early Years (EY) setting has an air quality monitoring system in place as part of their sustainability aims.
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 alongside corridors with the highest concentrations as a means of natural emissions capture	Ongoing (Recently research published has suggested 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).
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	Completed for 2022 (56 warnings issued)

Measure	LLAQM Action Matrix Theme	Action	Progress
		also 21).*A more targeted approach to idling, focusing on schools will be taken, which should make a differences in areas over short periods of time, utilising a variety of comms and enforcement action	
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.	No action required (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.	Completed for 2022 (Veolia maintained FORS Bronze accreditation in September 2022)
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	Ongoing (Commissioners are required to consider sustainability as part of the gateway report process. The Corporate Procurement team work with commissioners to explain the need for considering sustainability and social value in procurement processes, encourage commissioners to include it and provide methods of doing so to facilitate this, offering regular training including through the Quarterly Contract Owners meetings and in individual project-specific meetings. The Carbon Management Team have now developed a toolkit to support commissioners which is expected to be launched in 2023.)
16.2	Deliver servicing and freight	LB Bromley Borough-Wide Emissions Strategy to be developed, as part of wider corporate Sustainability Policy	Ongoing (Soft market testing with potential consultants has been undertaken to scope what might be involved in producing a borough-wide emissions strategy, however this would involve a significant investment of council resources with success dependent on action from central government. A detailed report on Bromley borough's emissions using N186 data was published in 2021, with a report for

Measure	LLAQM Action Matrix Theme	Action	Progress
			2022 being prepared using LEGGI data, an approach which ensures consistency in reporting between London boroughs.)
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.	Ongoing (Officers are still looking at the possibility of introducing more lockers around the Borough, however there are still only 7 car parks with live lockers installed. In total Bromley have 30 chargeable car parks, 2 free and 1 Disabled only car park.)
16.4	Deliver servicing and freight	Any development likely to create a significant number of trips will, where necessary, be 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.	Completed for 2022
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.	Completed for 2022 (Two electric hatchback cars expected for Highways Division in July 2023. One plug-in hybrid Mayoral car delivered, one expected in April 2023. Charging points installed in Central Depot and Civic Centre fleet parking areas. Demonstration light commercial vehicles being evaluated as they become available. Ongoing discussions with Departments for replacing vehicles with EV's as they reach the end of their lease terms. Four replacement Euro VI gritter commissioned.)
17.2	Borough fleet	Increase the number of plug-in hybrid and electric council vehicles through planned replacement programme	Completed for 2022 (One new plug-in hybrid car commissioned. Two EV chargers installed at vehicle bases (Civic and Central))
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	Completed for 2022 (Waste Fleet Euro VI compliant)
17.4	Borough fleet	Promote fuel-efficient driving through the driver induction and competence checks	Completed for 2022 (Routine part of driver competence check for new staff, authorised to drive Council vehicles.)
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.	Completed for 2022 (We have now determined that electric is the direction of travel and not hydrogen gas. Trials and demonstrations of electric vehicles for both waste collection and street cleaning were carried out in November 2022. We plan to jointly procure a single

Measure	LLAQM Action Matrix Theme	Action	Progress
			electric RCV as a test vehicle to run over the next few years, and then move to full electric fleet at contract extension in 2027 as part of the 8-year contract extension from 2027 if extension is successfully negotiated.)
17.6	Borough fleet	Monitor progress with vehicle manufacturers, other similar operators and technical developments to further support the intake of alternatively fuelled vehicles.	Completed for 2022 (An electric fleet is now the front runner for alternative to diesel and trial demonstrations of electric vehicles for both waste collection and street cleaning have been carried out in November 2022.)
17.7	Borough fleet	Increase the use of pool vehicles Uptake monitored and reported annually.	Completed for 2022 (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.	Completed for 2022 (Veolia maintained FORS Bronze accreditation in September 2022)
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	Completed for 2022 (A programme began in August 2022 and concluded in October 2022 to update Echo logistics and implement the Autonomise system 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 braking, harsh cornering, speed, and g-shock.)
17.10	Borough fleet	Supervisors of the waste and street cleansing service to use electric vehicles	Completed (March 2020 - 12 electric vehicles)
17.11	Borough fleet	Installation of electric charging point for Heavy Goods Vehicles (HGVs)	Completed for 2022 (All of Veolia's nine Environmental Manager electric vans also have this technology fitted)
17.12	Borough fleet	Increase the % of mobile equipment used (e.g. electric chainsaws) by the Arboriculture contractor	Ongoing (The statistics are yet to be confirmed by the contractor, but use of various pieces of mobile equipment have been reported at monthly contract monitoring meetings during 2022.)
17A.1	Borough fleet	Promote the uptake of alternative fuel cars via the staff lease scheme. The option to further incentivise	Completed for 2022

Measure	LLAQM Action Matrix Theme	Action	Progress
		drivers will be a discussion point when approaching the next procurement exercise	(Taxation and fuel costs continue to move the trend towards electric and hybrid vehicles. No diesel cars are ordered. The fleet now includes 11 full electric and 74 hybrid cars.)
18.1	Localised solutions	Through Planning process, identify opportunities for green infrastructure	Completed for 2022
18.2	Localised solutions	Feasibility of enhancing the public realm potentially through gyratory removal at Elmers End (see also 19).	Ongoing (funding for LEN bid has not yet been identified)
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.	Completed for 2022 (1590 trees have been planted in the 2022/23 planting season. 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	Completed for 2022 (The Council's tremendous 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 Tremendous programme. Furthermore, funding has been granted from the Platinum Jubilee Parks Fund to plant two new orchards in parks in 2023.)
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	Ongoing (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.	Ongoing (funding has not yet been secured for this project)
19A.1	Localised solutions	Continue to provide existing comprehensive waste and recycling collection service	Completed for 2022 (Maintained comprehensive waste and recycling collection service. Garden waste customers continue to grow in number and exceed 44,000. Started trials in flatted properties to improve recycling capture.)

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	Completed (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	Completed for 2022 (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. Continue to consider accepting additional items at the kerbside through contract meetings. Promotion of garden waste is a contractual requirement and was promoted in 2022 through targeted letters, the website, social media and articles in Environment Matters.)
19C.1	Localised solutions	Promote dust management at sites – using the accordance with the Mayor of London SPG as an exemplar	Completed for 2022 (Dust management is in accordance with the environmental permit)
19D.1	Localised solutions	Monitor and manage landfill gas generated by closed landfill site through existing network of pipes and landfill gas flare	Completed for 2022 (Landfill gas and leachate are managed at the closed landfill site in accordance with Environment Agency best practice. Management of the site is reported on a monthly basis and discussed via monthly Service Operations Board)
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	Completed for 2022 (The three trial sites have been agreed and continued to be used intermittently in association with volunteer and local friends Groups who have re-used the woodchip on shrub beds. Costs have been obtained for the installation of the agreed three areas where the wood chip piles can be officially stored. Additional sites are in the process of being considered with a view to expanding across the Borough.)
20.1	Cleaner transport	Through this AQAP and Bromley's LIP3 officers will continue dialogue regarding project and policy	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
		implementation. *Transport and Environmental Health staff form part of core AQAP Steering Group	
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	Completed for 2022 (34 schools are now engaged with the campaign, and certain schools are being targeted with additional publicity.)
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.
22.1	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 has 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	Completed for 2022 (Over 300 events in 2022)
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 in 2022)
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 (Ongoing EV trial to determine best type of EV CPs)
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 (Ongoing EV trial to determine best type of EV CPs)

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	Ongoing (Ongoing EV trial to determine best type of EV CPs)
25.1	Cleaner transport	Development of new cycle routes, both as part of TfL's strategic cycle network and local routes	Ongoing Progress for cycle infrastructure was affected due to insufficient funding
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.	Ongoing (TfL funding is still suspended for LNs in LBB)
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 Albermarle Road and Beckenham Road to connect Shortlands with Beckenham, plus a cycle route in Valley Road to Harris Primary.	Completed for 2022 (The footpath was not in the end feasible, but the parallel zebra (tiger) crossing and the cycle route were introduced. In place of the Valley Primary School footpath scheme a zebra crossing was installed outside the school)
25.4	Cleaner transport	Improve pedestrian safety- installation of new pedestrian crossings	Completed for 2022 (3 crossings were installed at Lennard Road (parallel zebra), Red Lodge road (informal crossing point) and Old Hill (new pedestrian refuge))
25.5	Cleaner transport	Improve pedestrian infrastructure to encourage walking to school	Completed for 2022 (Pool river path walking and cycling infrastructure was improved and new footway build out at Addison Road and Kent House Road.)
25.6	Cleaner transport	Provide high quality cycle hubs at stations and continue to deliver on-street cycle parking and Bike hangers	Completed for 2022 (three bike hangers installed in 2022/23 F/Y)

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in London Borough of Bromley in 2022

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	16
Number of planning applications required to monitor for construction dust	48
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	73
Number of developments where an AQ Neutral building and/or transport assessments undertaken	16
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
<p>NRMM: Central Activity Zone , Canary Wharf and Opportunity Areas</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Number of audits</p> <p>% of sites unregistered prior to audit</p> <p>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.</p>	N/A
<p>NRMM: Greater London (excluding Central Activity Zone, Canary Wharf and Opportunity Areas)</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Number of audits</p> <p>% of sites unregistered prior to audit</p> <p>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.</p>	<p>32</p> <p><i>33 registered on website, of which 32 registered as compliant and 1 as non-compliant. There were 25 NRMM audit inspections carried out of which 3 were non-compliant and not registered on the website. 36% of sites were 'cold engaged' i.e., unregistered prior to audit **.</i></p>

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

** *For one of the sites inspected and non-compliant planning enforcement action was taken to action non-compliance. The non-compliant equipment was removed from site*

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 expected for the Highways Division in July 2023. One plug-in hybrid Mayoral car was delivered, another one is expected in April 2023. Charging points were installed in Central Depot and Civic Centre fleet parking areas. Demonstration light commercial vehicles are being evaluated as they become available. There are ongoing discussions with Departments for replacing vehicles with EV's as they reach the end of their lease terms. Four replacement Euro VI gritter were commissioned.

One fully electric van was procured for Public Protection & Enforcement 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 2022 – 2023 through match funding.

4.2 Air Quality Alerts

The Council is a member of the AirText consortium. At the end of 2022, Bromley had 200 active subscribers.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

During 2022, 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 have been ratified according to Defra LAQM Technical Guidance standards.

In 2020 a PM_{2.5} beta attenuation monitor (BAM) was added to the existing continuous monitoring site at Harwood Avenue (BRY-CM3). On several occasions, there were a few issues with the BAM Tape which would prevent PM_{2.5} measurements from being recorded. However, these issues were quickly rectified by the appropriate service engineer within a couple of days of occurrence.

PM₁₀ Monitoring Adjustment

All PM₁₀ monitoring data has been fully ratified. Ratification of data is undertaken by Imperial in accordance with membership to the LLAQM. Prior to ratification, a fixed zero offset of 15 µg m⁻³ is removed from the raw PM₁₀ concentration. The PM₁₀ concentrations are then divided by 1.21 to make them equivalent to the reference method, following Defra guidance (LAQM.TG(22)).

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 NO₂ PT scheme³. AIR NO₂ PT forms an integral part of the UK NO₂ Network's QA/QC and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local

³ LGC (2022) Summary of Laboratory Performance in AIR NO₂ Proficiency Testing Scheme (May 2020 – June 2022) Available at: [WASP – Annual Performance Criteria for NO₂ Diffusion Tubes \(defra.gov.uk\)](https://www.defra.gov.uk/llaqm/wasp/) Accessed: 03/05/2023

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:

AR037 (May – June 2020) – no results reported

AR039 (July – August 2020) – no results reported

AR040 (September – October 2020) – 75%

AR042 (January – February 2021) – 25%

AR043 (May – June 2021) – 100%

AR045 (July – August 2021) – 100%

AR046 (September – October 2021) – 100%

AR049 (January – February 2022) – 100%

AR050 (May – June 2022) – 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 2022 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 2022 version 3/23 is 0.83, based on 27 studies, using the LAQM national bias adjustment spreadsheet⁴ which is shown in Figure A-1.

⁴ Defra (2023), LAQM, National bias adjustment factor spreadsheet. Available at: [Database Diffusion Tube Bias Factors v03 23-FINAL.xlsx \(live.com\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/115555/Database_Diffusion_Tube_Bias_Factors_v03_23-FINAL.xlsx) Accessed: 03/05/2023

Figure 5. National Bias Adjustment Factor Spreadsheet (v03/23)

National Diffusion Tube Bias Adjustment Factor Spreadsheet					Spreadsheet Version Number: 03/23					
Follow the steps below in the correct order to show the results of relevant co-location studies					This spreadsheet will be updated at the end of June 2023					
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods					LAQM Helpdesk Website					
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet					Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.					
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.										
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.										
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 shown in blue at the foot of the final column.						
If a laboratory is not shown, we have no data for this laboratory.		If the 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.	If you have your own co-location study then see footnote. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953						
Analysed By	Method	Year	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	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	KS	Marylebone Road Intercomparison	12	52	42	22.8%	G	0.81
Gradko	20% TEA in Water	2022	UB	Plymouth City Council	12	18	18	3.2%	G	0.97
Gradko	20% TEA in water	2022	UC	Belfast City Council	12	26	20	30.7%	G	0.76
Gradko	20% TEA in water	2022	R	Belfast City Council	12	47	36	28.1%	G	0.78
Gradko	20% TEA in water	2022	R	Belfast City Council	12	25	22	14.0%	G	0.88
Gradko	20% TEA in water	2022	R	Belfast City Council	12	36	28	29.0%	G	0.78
Gradko	20% TEA in water	2022	R	Brighton & Hove City Council	10	37	23	62.8%	G	0.61
Gradko	20% TEA in water	2022	UB	Herfsmere Borough Council	12	16	15	7.1%	G	0.93
Gradko	20% TEA in water	2022	R	Southampton City Council	12	36	28	30.6%	G	0.77
Gradko	20% TEA in water	2022	UC	Southampton City Council	12	28	24	15.4%	G	0.87
Gradko	20% TEA in water	2022	R	Southampton City Council	12	34	31	8.4%	G	0.92
Gradko	20% TEA in water	2022	R	Worcestershire	11	13	12	4.2%	G	0.96
Gradko	20% TEA in water	2022	R	Lancaster City Council	13	34	27	25.9%	G	0.79
Gradko	20% TEA in water	2022	R	Lancaster City Council	12	28	24	15.2%	G	0.87
Gradko	20% TEA in water	2022		Overall Factor* (27 studies)					Use	0.83

Discussion of Choice of Factor to Use

During 2022 there had been only one diffusion tube co-located with the continuous monitoring at Harwood Avenue. Therefore, no local bias adjustment factor is available for 2022 due to the lack of co-location duplicate or triplicate sites. Therefore, the national bias adjustment factor of 0.83 (version 03/23) for the diffusion tube method 20% triethanolamine in water, analysed by Gradko was used.

Table L. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
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 objectives. Annualisation was not required to be undertaken at any sites.

Distance Adjustment

The monitoring sites that have been bias adjusted and shown to be with 10% of the NO₂ 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(16)).

One site is above the threshold (DT19, High Street, Orpington) and is considered not representative of relevant exposure. The distance-corrected annual mean NO₂ concentration is shown below.

The local annual mean background concentrations in 2022 from the Defra 2018-based background maps⁵ have been used for the calculation.

Table M present the outputs from the NO₂ fall off with distance tool.

Table M. 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	1.7	5.5	40.6	14.9	33.9

⁵ Defra (n.d.), Background Maps. Available at: [Background Maps | LAQM \(defra.gov.uk\)](https://www.defra.gov.uk/laqm/background-maps/) Accessed: 03/05/2023

Appendix B Full Monthly Diffusion Tube Results for 2022

Table N. NO₂ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2022 % ^(b)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
1	100.0	100.0	47.1	27.5	42.4	33.9	31.1	27.0	32.9	32.6	35.1	29.8	32.8	41.4	34.5	28.6
2	100.0	100.0	42.1	17.9	32.0	18.4	15.3	13.6	15.0	16.1	19.6	20.7	21.6	29.3	21.8	18.1
3	100.0	100.0	44.4	27.6	44.3	30.7	27.9	25.5	32.9	32.1	35.4	29.6	35.1	33.5	33.2	27.6
4	92.3	92.3	40.3	24.9	43.3		24.7	21.4	25.6	28.6	28.9	28.2	32.7	40.6	30.8	25.6
5	82.6	82.6	42.1	21.9	34.8	29.3	25.9	23.9	26.1	28.7			27.0	36.6	29.6	24.6
6	100.0	100.0	40.8	24.6	38.5	28.1	25.9	23.1	25.5	27.4	29.8	30.4	33.2	39.6	30.6	25.4
7	100.0	100.0	47.0	28.6	45.7	33.0	29.3	24.8	31.1	32.2	35.5	32.5	34.8	41.6	34.7	28.8
8	100.0	100.0	34.2	18.5	33.0	21.9	19.0	13.6	18.4	20.4	23.9	24.6	26.8	35.3	24.1	20.0
9	100.0	100.0	41.6	24.3	41.6	27.4	23.1	21.5	25.1	25.0	29.9	28.8	31.1	36.8	29.7	24.6
10	100.0	100.0	55.9	42.5	54.5	42.8	34.3	36.7	39.3	41.6	42.7	40.4	38.4	42.2	42.6	35.4
11	100.0	100.0	44.4	25.8	35.0	29.4	23.1	23.6	28.9	28.5	32.8	33.3	34.1	41.0	31.7	26.3
12	100.0	100.0	60.5	42.1	55.0	43.5	35.5	32.6	38.0	41.2	41.3	44.7	41.3	48.2	43.6	36.2
13	100.0	100.0	37.8	21.4	42.7	33.6	26.1	20.3	29.8	30.8	34.0	32.0	31.9	36.3	31.4	26.0
14	92.3	92.3	33.8	18.6	31.1	20.1	13.4	12.0	14.3	15.3	19.2	18.2	22.6		19.9	16.5
15	100.0	100.0	51.9	30.8	39.0	29.7	31.9	24.7	27.8	27.7	32.6	31.4	35.2	40.9	33.6	27.9
16	90.4	90.4	31.2	17.6	22.8	16.1		11.5	13.7	13.6	18.0	15.6	18.0	24.7	18.4	15.3
17	92.6	92.6		26.7	36.3	27.4	24.8	24.4	29.9	30.9	32.9	32.7	35.0	39.5	30.9	25.7

18	82.6	82.6	27.6			17.5	14.2	11.5	15.0	16.1	18.0	15.4	17.1	23.9	17.6	14.6
19	100.0	100.0	<u>60.1</u>	44.8	53.9	46.3	42.4	43.6	45.6	47.3	46.1	50.7	49.8	56.8	48.9	40.6
20	77.1	77.1		22.5	27.8		18.1	15.4		19.7	20.3	20.7	23.2	30.3	22.0	18.3
21	100.0	100.0	40.2	29.5	46.7	35.6	30.8	33.2	33.8	33.5	37.6	39.5	40.7	39.4	36.7	30.5
22	100.0	100.0	30.8	18.2	34.7	26.2	16.8	16.2	20.6	23.6	25.2	21.9	23.3	28.2	23.8	19.8
23	90.4	90.4	39.7	27.5		28.2	24.5	22.3	24.4	23.6	28.2	28.2	30.8	36.8	28.5	23.7
24	92.3	92.3	36.8		39.9	30.1	23.1	20.0	25.2	26.7	28.5	27.3	26.1	34.5	28.9	24.0
25	92.3	92.3	33.3	21.5	27.7		17.5	15.6	17.8	19.0	22.8	22.4	22.5	29.8	22.7	18.9
26	100.0	100.0	33.9	17.7	34.2	24.9	18.7	15.7	17.8	19.5	22.8	22.5	26.2	31.8	23.8	19.8
27	100.0	100.0	36.0	23.3	31.8	20.9	20.5	19.0	18.2	19.0	24.0	24.4	27.1	32.0	24.7	20.5
28	92.3	92.3	47.1		46.5	38.3	30.6	29.9	34.2	36.4	39.3	29.9	32.6	47.3	37.5	31.1
29	100.0	100.0	35.2	20.4	36.5	25.6	21.6	20.3	22.9	22.8	25.4	25.4	26.7	28.0	25.9	21.5
30	100.0	100.0	42.6	26.2	42.9	29.7	24.3	20.9	19.5	16.4	28.1	26.1	27.4	33.0	28.1	23.3
31	100.0	100.0	45.4	26.2	44.3	32.8	26.9	21.9	26.4	28.4	30.1	30.4	30.1	38.4	31.8	26.4
32	100.0	100.0	40.9	25.1	37.9	28.0	21.1	20.4	22.6	25.7	28.4	26.6	30.8	38.7	28.8	23.9

Notes:

Concentrations are presented as $\mu\text{g m}^{-3}$.

Exceedances of the NO₂ annual mean AQO of 40 $\mu\text{g m}^{-3}$ are shown in **bold**.

NO₂ annual means in excess of 60 $\mu\text{g m}^{-3}$, indicating a potential exceedance of the NO₂ hourly mean AQS objective are shown in **bold and underlined**.

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

Blank cells are where the diffusion tube was missing from the site and as such were not available for analysis for this monitoring period.