London Borough of Sutton Air Quality Annual Status Report for 2022

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This report provides a detailed overview of air quality in the London Borough of Sutton during 2022. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process[1].

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

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Abbreviations

Abbreviation	Description
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
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 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 ($PM_{2.5}$)	25 µg m^{-3}	Annual mean	2021
Particles ($PM_{2.5}$)	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2021
Sulphur dioxide (SO_2)	266 µg m^{-3} not to be exceeded more than 35 times a year	15-minute mean	31 Dec 2005
Sulphur dioxide (SO_2)	350 µg m^{-3} not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO_2)	125 µg m^{-3} mot to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

Notes:

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

1. Air Quality Monitoring

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2022

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA ? If so, which AQMA ?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Inlet height (m)	Pollutants monitored	Monitoring technique
ST4	Wallington	528925	163804	Kerbside	Y	5	0.8	1.5	NO_2, PM_{10}	Chemiluminescent; FDMS
ST5	Beddington Lane North	529400	167224	Industrial	Y	6	4.5	1.5	NO_2,PM_{10}	Chemiluminescent; FDMS
ST6	Worcester Park	522557	165787	Kerbside	Y	2	1.3	1.5	NO_2, PM_{10}, $PM_{2.5}$	Chemiluminescent; FDMS
ST8 [1]	Beddington Lane	529781	166597	Industrial	Y	330	N/A	1.5	NO_2, PM_{10}	Chemiluminescent; FDMS
ST9 [2]	Beddington Village	530124	165223	Roadside	Y	15	5	1.5	NO_2, PM_{10}	Chemiluminescent; FDMS

Notes:
[1] Monitor was decommissioned and relocated 16th October 2020
[2] Monitor was relocated and installed 16th October 2020

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

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor (Y/N)
ST21	Glastonbury Road	525567	166291	Urban Background	Y	6	2	2	NO_2	N
ST22	Dorset Road Belmont	525063	162474	Roadside	Y	12	2	2	NO_2	N
ST23	Sandy Lane South	529734	163868	Roadside	Y	5	2	2	NO_2	N
ST24	Derry Road	530130	165404	Roadside	Y	7	2	2	NO_2	N
ST25	Staines Avenue	523874	165683	Roadside	Y	15	2	2	NO_2	N
ST26	West Street	527683	164663	Roadside	Y	2	2	2	NO_2	N
ST07	Hackbridge Primary	528401	166038	Urban background	Y	0	56	2	NO_2	N
ST08	Victor Seymour	527786	165021	Urban background	Y	0	33	2	NO_2	N
ST29	Park Lane	528339	164615	Roadside	Y	2	6	2	NO_2	N
ST10	Muschamp Priory	527284	165778	Urban background	Y	0	20	2	NO_2	N
ST11	Sherwood Park School	529835	165041	Urban background	Y	0	35	2	NO_2	N
ST32	Alcorn Close	525184	165845	Urban background	Y	40	25	2	NO_2	N
ST33	Carshalton Road	526021	164025	Roadside	Y	3	1	2	NO_2	N
ST34	Oakhill Road	525772	165118	Roadside	Y	10	1	2	NO_2	N
ST35	Gander Green Lane	524782	165167	Roadside	Y	10	1	2	NO_2	N
ST36	Croydon Rd Beddington	530645	164839	Roadside	Y	0	11	2	NO_2	N

ST27	Haddon Road / St Nicholas Way	525691	164599	Roadside	Y	11	2	2	NO_2	N
ST38	Brighton Road, Sutton	526046	163636	Roadside	Y	2	10	2	NO_2	N
ST39	Rose Hill roundabout	526019	166469	Roadside	Y	6	2	2	NO_2	N
ST40	38 High Street, Cheam	524357	163599	Roadside	Y	2	1	2	NO_2	N
ST42	Royston Park	526605	165364	Urban background	Y	20	95	2	NO_2	N
ST43	Chiltern Road	525883	162518	Roadside	Y	13	1	2	NO_2	N
H1	Hackbridge Road	528359	166067	Roadside	Y	0.5	17	2	NO_2	N
H2	Clover Way	528437	166275	Urban background	Y	0	25	2	NO_2	N
H3	57 London Rd	528637	166021	Roadside	Y	0	5	2	NO_2	N
BL	Beddington Lane	529400	167235	Roadside	Y	15	2	2	NO_2	N

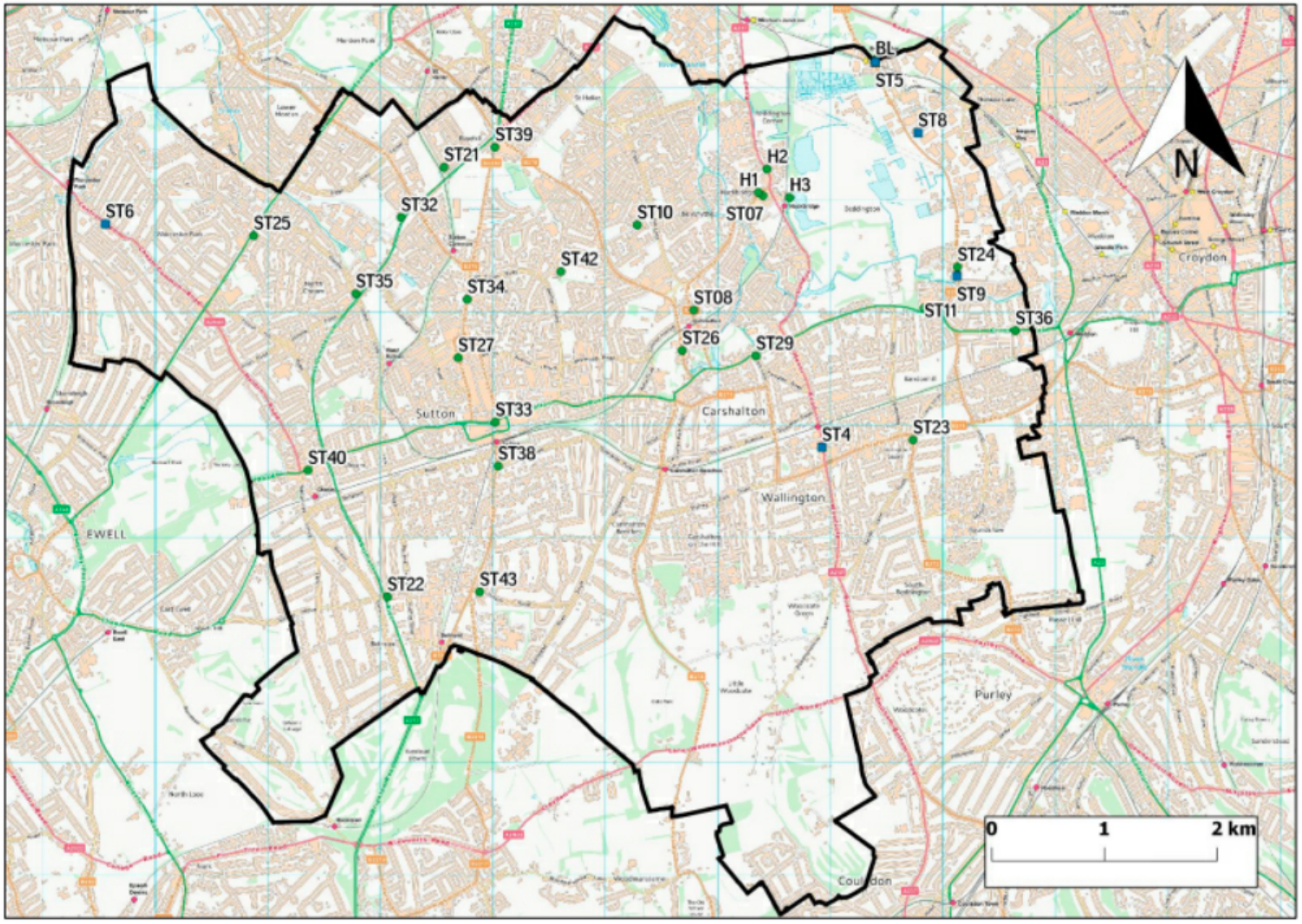

Figure 1. Air Quality Monitoring Locations in the London Borough of Sutton

1.2 Comparison of Monitoring Results with AQOs

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.

Table D. Annual Mean NO_2 Ratified and Bias-adjusted Monitoring Results

Site ID	Site type	Valid data capture for monitoring period %[a]	Valid data capture 2022 %[b]	2015	2016	2017	2018	2019	2020	2021	2022
ST4	Kerbside	90	90	**61.40 (c)**	**63.00**	**53.00**	**47.00**	**45.86**	**40.76**	**43.29**	**44.23 (32.7)**
ST5	Industrial	99	99	32.00	36.00	32.00	29.00	29.43	22.80	21.90	24.39
ST6	Kerbside	96	96	**52.00**	**57.00**	**52.00**	**52.00**	**51.09**	39.40 (34.9)	**43.36**	39.87 (37.6)
ST8 [1]	Industrial	-	-	27.00	30.00	25.00	25.00	25.10	19.14 (c)	-	-
ST9 [2]	Roadside	99	99	-	-	-	-	-	21.56 (*c)	24.31	22.65
ST21	Urban background	100	100	27.32	32.07	27.15	29.37	26.84	20.63	21.48	20.24
ST22	Roadside	83	83	37.30	37.24	38.54	36.10	33.51	26.72	24.04	25.04
ST23	Roadside	100	100	32.15	35.02	33.64	36.99	34.87	26.98	28.09	27.09
ST24	Roadside	100	100	26.68	30.6	26.26	28.87	25.67	19.16	21.86	20.32
ST25	Roadside	100	100	32.02	**34.65**	32.57	31.61	29.74	23.86	25.15	22.60
ST26	Roadside	92	92	36.64	**41.27**	38.54	38.38	35.95	25.61	29.60	26.06
ST07	Urban background	100	100	21.87	24.17	21.98	22.35	20.5	17.06	16.63	16.14
ST08	Urban background	100	100	23.55	28.52	26.26	24.03	23.21	17.39	12.00	17.43

Site ID	Site type	Valid data capture for monitoring period %[a]	Valid data capture 2022 %[b]	2015	2016	2017	2018	2019	2020	2021	2022
ST29	Roadside	100	100	37.85	**41.48**	39.52	38.93	35.70	29.60	33.47	34.64
ST10	Urban background	100	100	21.12	24.29	21.81	22.72	20.13	14.62	16.17	14.64
ST11	Urban background	83	83	23.39	26.43	24.48	24.46	22.55	18.56	19.53	19.45
ST32	Urban background	100	100	22.36	27.00	22.43	24.34	20.01	16.67	19.28	18.20
ST33	Roadside	100	100	37.34	38.79	33.20	34.46	34.15	27.72	30.20	30.37
ST34	Roadside	100	100	39.43	**42.78**	**42.28**	38.85	**40.67**	32.89	33.29	32.09
ST35	Roadside	100	100	31.50	34.06	30.53	31.06	28.66	21.99	23.99	21.99
ST36	Roadside	100	100	29.05	32.81	28.84	29.30	27.37	22.67	25.45	23.05
ST27	Roadside	92	92	36.78	39.56	36.05	35.59	34.66	28.11	29.06	30.04
ST38	Roadside	100	100	34.65	36.83	34.62	35.08	33.18	24.73	29.09	27.48
ST39	Roadside	100	100	37.07	39.32	38.89	**40.71**	**41.80**	**49.51**	**41.13**	**40.74 (33.0)**
ST40	Roadside	58	58	**42.90**	**44.85**	39.87	**41.14**	**42.05**	31.04	32.96	34.33 (34.86) *Ann
ST42	Urban background	92	92	20.98	21.82	23.05	19.86	17.35	14.06	17.12	15.07
ST43	Roadside	100	100	-	-	-	30.01	28.37	22.20	23.86	23.91
H1	Roadside	100	100	28.90	32.29	29.90	26.78	32.58	24.21	27.01	27.46
H2	Urban background	100	100	26.50	29.26	25.37	**44.10**	24.33	18.13	21.88	19.05

Site ID	Site type	Valid data capture for monitoring period %[a]	Valid data capture 2022 %[b]	2015	2016	2017	2018	2019	2020	2021	2022
H3	Roadside	100	100	32.92	32.35	**40.32**	28.99	**44.46**	36.09	33.00	33.60
BL	Roadside	75	75	-	34.11	32.22	29.37	29.1	26.79	24.55	31.11

Notes:

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

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

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

Means for diffusion tubes have been corrected for bias.

NO_2 annual data has been distance adjusted for data within 10% of the NO2 annual mean objective. The adjusted results are shown in brackets.

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%. The unadjusted results are shown in asterisk and brackets.

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%).

Automatic monitoring site ST4 (Wallington) exceeded NO_2 annual mean AQO with NO_2 concentrations of 44.23 µg m^{-3}.

Diffusion tube monitoring sites ST39 exceeded NO_2 annual mean AQO with NO_2 concentrations of 40.74 µg m^{-3}.

Values in brackets calculated at relevant exposure for 2020 monitoring sites.

(*) Data capture is too low (<33%) for annualisation in accordance with LLAQM Technical Guidance

[1] Monitor was decommissioned and relocated 16th October 2020

[2] Monitor was relocated and installed 16th October 2020

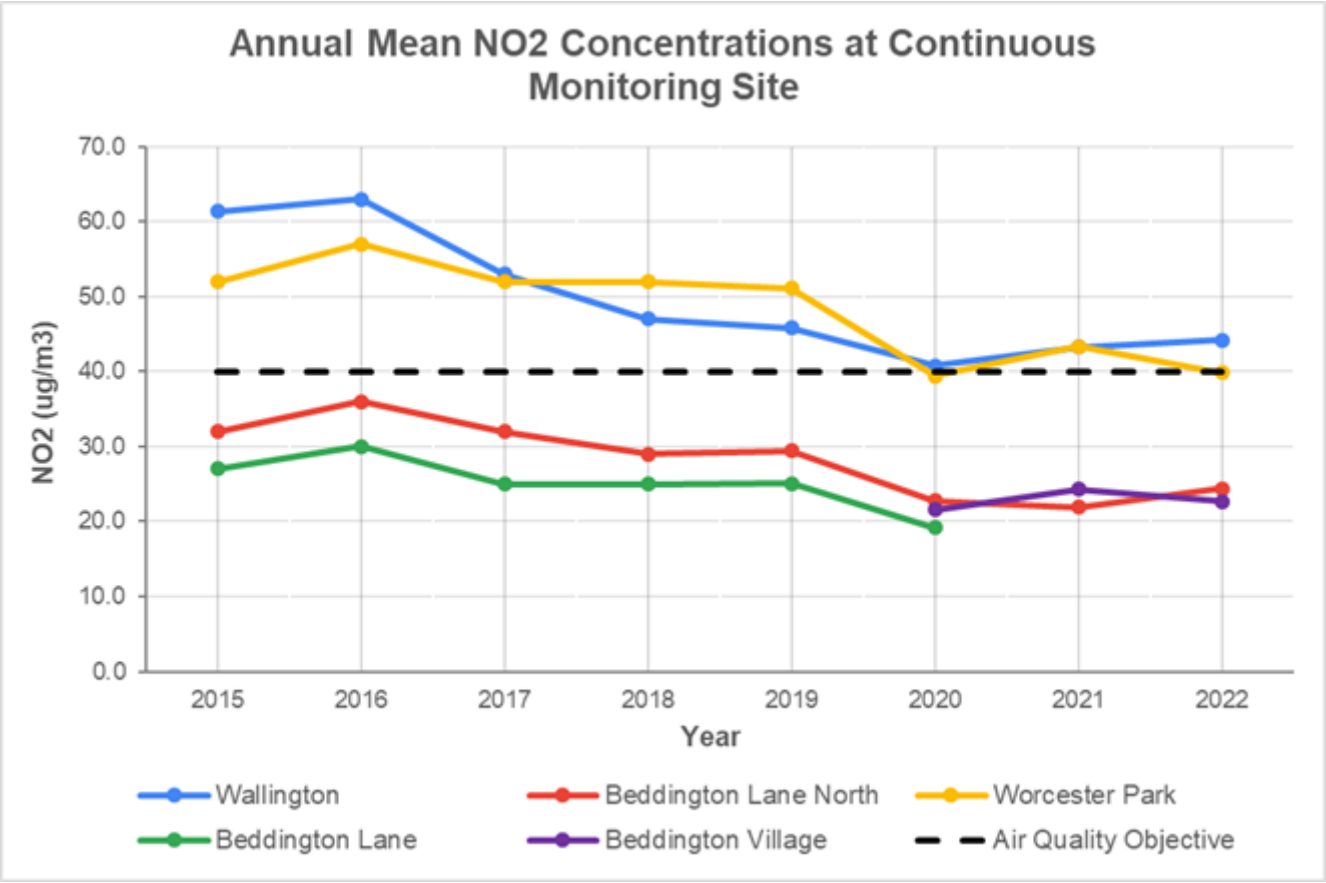

Figure 2. Annual Mean NO_2 Concentrations at Continuous Monitoring Sites

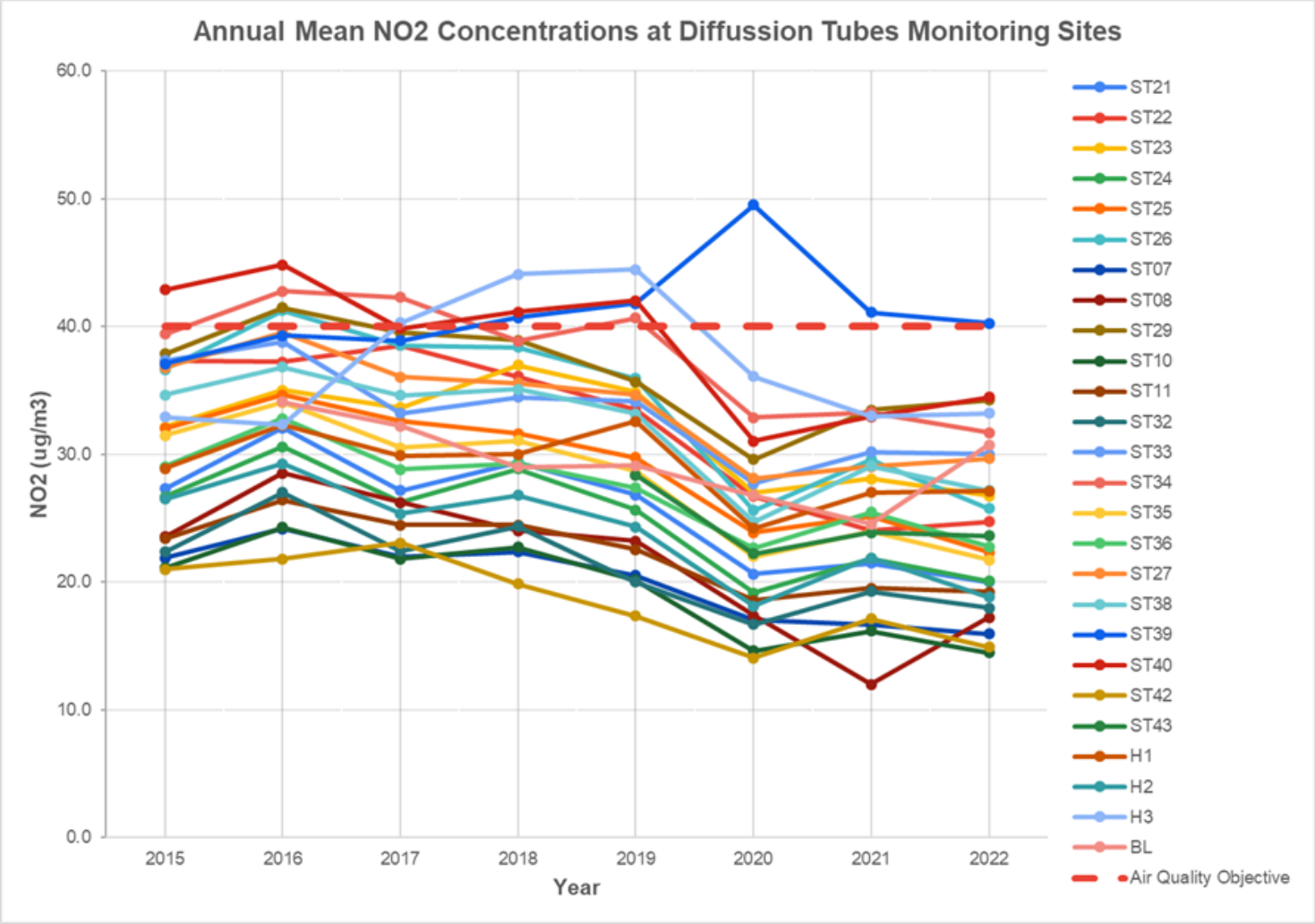

Figure 3. Annual Mean NO_2 Concentrations at Diffusion Tube Monitoring Sites

Diffusion tube data over the years show a decrease in NO_2 concentration. This year, 2022, only one diffusion tube site was above the 40 µg m^{-3} Air Quality Objective.

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

Site ID	Valid data capture for monitoring period %(a)	Valid data capture 2022 %(b)	2015	2016	2017	2018	2019	2020	2021	2022
Wallington	90	90	9 (198.7)	**22**	1	0	0	0	1	0
Beddington Lane North	99	99	0 (99.8)	0	0	0	0	0	0	0
Worcester Park	96	96	11	**24**	11	7	9	0	0	0
Beddington Village	99	99	-	-	-	-	-	0 (72.1)	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 was carried out for six months, the maximum data capture for the full calendar year would be 50%)

In 2022, all automatic monitoring sites showed that the concentration of NO_2 (over 1-hour periods) never exceeded 200 µg m^{-3}.

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

Site ID	Valid data capture for monitoring period %([a])	Valid data capture 2022 %([b])	2015	2016	2017	2018	2019	2020	2021	2022
ST4 Wallington	98	98	16	23	25	23	21	18.7	18.0	20.22
ST5 Beddington Lane North	95	95	24	24	31	22	22	21.4	17.6	20.15
ST6 Worcester Park	99	99	23	20	20	20	21 (c)	15.3 (C)	14.8	18.15
ST8 Beddington Lane	-	-	19 (c)	23	23	22	17	14.5 (*c)	-	-
ST9 Beddington Village	96	96	-	-	-	-	-	14.5 (*c)	17.3	19.43

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%.

(c) 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 33%.

Values in brackets calculated at relevant exposure for 2020 monitoring sites.

(*) Data capture is too low (<33%) for annualisation in accordance with LLAQM Technical Guidance

[1] Monitor was decommissioned and relocated 16th October 2020 [2] Monitor was relocated and installed 16th October 2020

In 2022, all automatic monitoring sites did not exceed the PM_{10} annual mean AQO of 40 µg m^{-3}.

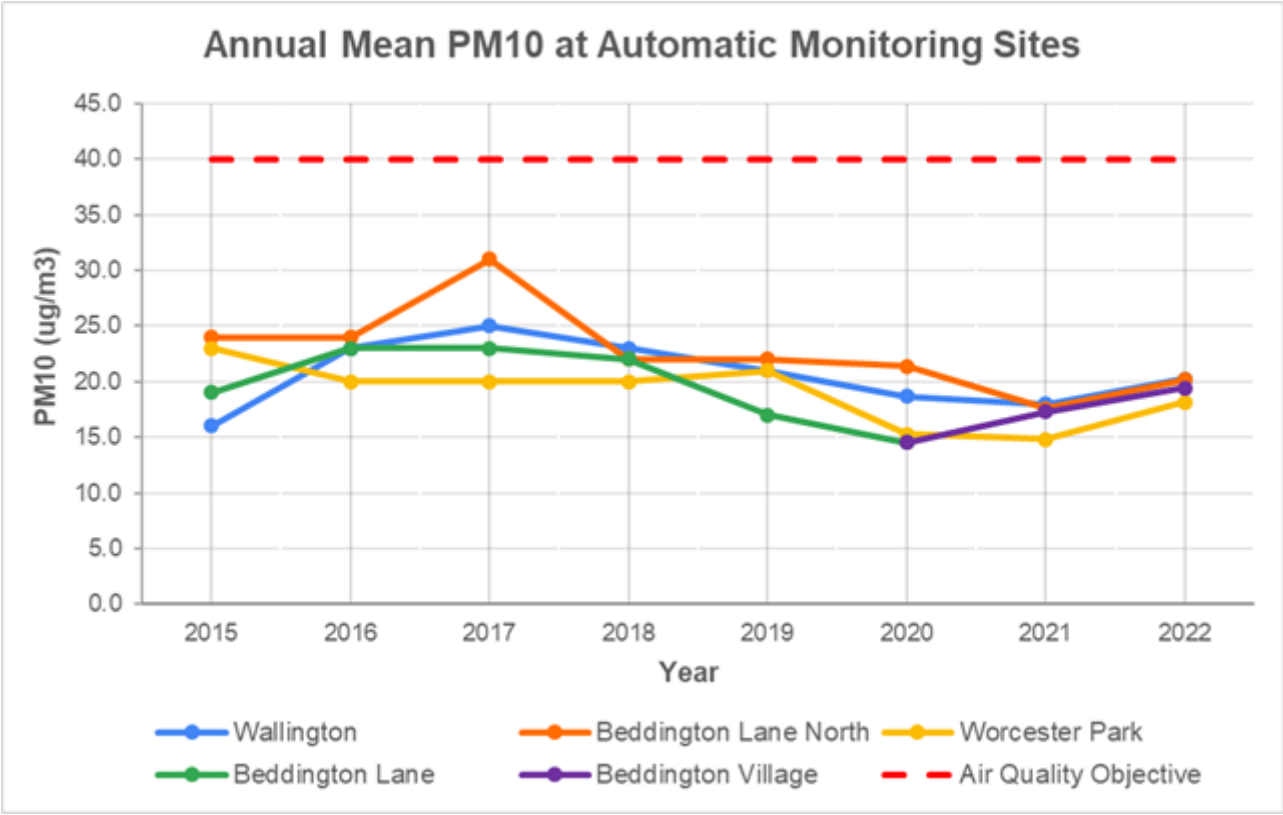

Figure 4. Annual Mean PM10 Automatic Monitoring Results

PM_{10} concentrations have remained relatively stable in all recorded years. However, there is a slight upward trend (since 2019), as shown in Figure 4. Concentrations have remained below the AQO of 40 µg m^{-3} in all reported years.

Table G. 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 2022 %[b]	2015	2016	2017	2018	2019	2020	2021	2022
ST4 Wallington	98	98	0 (25.3)	5	6	4	7	1	0	1
ST5 Beddington Lane North	95	95	13	5 (34)	21	2	13	8	1	1
ST6 Worcester Park	99	99	3 (33)	8	2	7	10 (44)	1 (22.6)	0	2
ST8 Beddington Lane	-	-	8	8 (37)	5	2	4	0 (23.3)	-	-
ST9 Beddington Village	96	96	-	-	-	-	-	1 (26.2)	0 (28)	1

Notes

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

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

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

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

In 2022, all automatic monitoring sites did not exceed the PM_{10} 24-hour mean objective, and the number of PM_{10} 24-hour mean exceedances has been falling over the years.

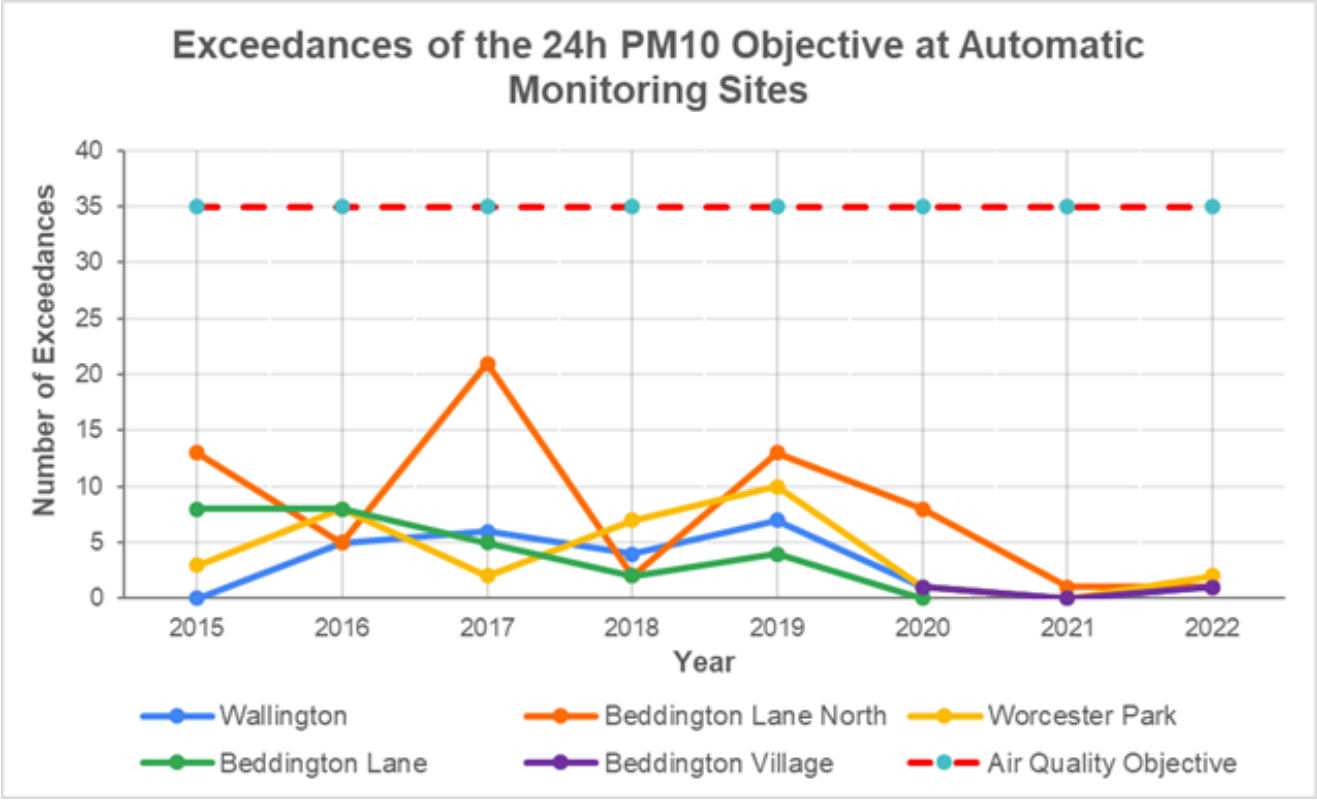

Figure 5. Exceedances of the 24h PM_{10} Objective at Automatic Monitoring Stations

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

Site ID	Valid data capture for monitoring period %[(a)]	Valid data capture 2022 %[(b)]	2015	2016	2017	2018	2019	2020	2021	2022
ST5 Beddington Lane North	97	97	14.8	14.4	15.2 (c)	12	**11.7**	9.4	10	10.15

Notes

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

Exceedances of the $PM_{2.5}$ annual mean AQO of 25 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%).

(c) 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 33%.

In 2022, the annual mean of $PM_{2.5}$ was 10.15 µg m^{-3} which is below the Air Quality Objective

2.0 Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table I provides a brief summary of the London Borough of Sutton progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2022 are shown at the bottom of the table.

Table I. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
1	Cleaner Transport	Discourage unnecessary engine idling	The Pan London project finished in 2022 but we continue to investigate reports of vehicle idling. In 2022, numerous sites were identified for anti-idling signs, over 50 anti-idling signs were installed.
2	Cleaner Transport	Ensure that Transport and air quality policies and projects are integrated	10 permanent school streets were introduced in November 2021, In 2022 work has continued to identify other locations and four additional schemes are programmed for delivery in 2023/24. The LIP programme for 2022/23 includes projects to introduce a number of area-wide 20mph schemes, as well as pedestrian, cycling and bus priority improvements. Which aim to provide more modal choice.
3	Cleaner Transport	Implement measures to control speeds and smooth traffic flows in residential areas where pedestrians and cyclists are to be given greater priority	Delivery of two 20mph schemes. 10 permanent school streets were introduced in November 2021, and in 2022 work has continued to identify other locations and

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
			four additional schemes are programmed for delivery in 2023/24.
4	Cleaner Transport	Encourage car sharing by promoting Car Clubs in order to reduce vehicle ownership and increase the proportion of electric, hydrogen and ultra-low emission vehicles within Car Clubs	Car club contracts were developed and will be going out to the market Summer of 2023. The proposed contract includes targets to introduce EV and hybrid vehicles within a two-year time frame.
5	Cleaner Transport	Support communities wishing to enact temporary road closures, encourage Play Streets and run campaigns to raise awareness of the benefits of not using a private motor vehicle	No further Play Streets are scheduled to take place
6	Cleaner Transport	Offer residents free or discounted parking charges for zero-emission vehicles (e.g. electric) within Council-run car parks and free or discounted parking permits for zero-emission vehicles	Concessions for Electric Vehicles in LBS car parks remain unchanged. Resident permits for fully Electric Vehicles attract the lowest cost of all resident permits.
7	Cleaner Transport	Use parking policies to help reduce pollution emissions	CO2 based pricing for residents permits unchanged. School Streets continue to decrease traffic around schools.
8	Cleaner Transport	Review of road space allocation to identify opportunities for improving bus journey times, public transport options and the cycling experience while minimising impacts of emissions caused by congestion	Bus priority improvements are being investigated in the Worcester Park area to improve reliability and seek air quality improvements. Further investigations are being undertaken on specific locations (e.g. Stafford Road) to improve journey times and reduce congestion.

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
9	Cleaner Transport	Provision of infrastructure and support to encourage a modal switch to walking and cycling	10 permanent School Streets are in place and significant works carried out on the Beddington Cycleway major project in 2022 with plans to complete in 2023.
10	Cleaner Transport	Promote awareness of Low Emission Zones and creation of local Low Emission Zones	4 school streets have been developed in 2022 and are currently programmed for delivery in 2023, and a Phase 3 programme is being considered.
11	Cleaner Transport	Work with Transport for London and other relevant providers to improve public transport connections, availability for passengers and a cleaner fleet mix	Ongoing discussions with TFL in 2022 who are seeking to roll out electric buses within the borough, these discussions have progressed and vehicles should be in place across most of the borough in 2023
12	Cleaner Transport	Introduce a Dockless electric bike hire scheme to encourage mode-shift amongst residents & commuters	A scheme was launched in September 2022 in conjunction with Kingston Council
13	Delivery servicing and freight	Encourage existing contractors providing Council services to be members of the Fleet Operator Recognition Scheme and obtain Gold accreditation	Corporate procurement guidance includes mandatory instructions to follow the sustainability and social value strategies. This objective will be supported by this process on a case-by-case basis.
14	Delivery servicing and freight	Update local authority procurement policies to encourage contractors with fleets of more than 10 vehicles providing Council services to reduce emissions from their fleets and reduce pollution from logistics and servicing	Included as a focus area of the Councils wider Environmental Strategy, the development of a new sustainable procurement guide was progressed in 2022
15	Delivery servicing and freight	Retiming of freight deliveries to commercial centres	Due to limited resources, there was no progress in 2022
16	Delivery servicing and freight	Reduce emissions from deliveries through, e.g. promotion of consolidation and/or	Due to limited resources, there was no progress in 2022

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
		Virtual Loading Bays with priority loading for ultra-low emission delivery vehicles	
17	Borough fleet actions	Procurement policies to be developed to encourage new contractors providing Council services to only use vehicles that meet Euro VI emissions standards	Existing procurement guidance includes mandatory instructions to follow the sustainability and social value strategies. This objective will be supported by this process on a case-by-case basis.
18	Borough fleet actions	Increase the number of hydrogen, electric, hybrid, bio-methane and cleaner vehicles in the borough's fleet	The current fleet lease contract is being extended to 31 March 2024. In 2022 the tender for the next fleet contract was written to allow the successful bidder sufficient time to provide the relevant vehicles required. The council is to install the necessary electric charging infrastructure at Council sites to support these vehicles.
19	Emissions from developments and buildings	Ensure emissions from construction and/or demolition are minimised	Planning conditions relating to air quality are summarised in Table J. Officers apply relevant air quality conditions when consulted on planning applications, including compliance with the SPGs for Control of Dust and Emissions during Construction and Demolition and Sustainable Design and Construction Practice.
20	Emissions from developments and buildings	Ensure enforcement of Non-Road Mobile Machinery (NRMM) air quality policies	The use of our standard NRMM planning condition during 2022 is summarised in Table J. Additionally, the Council is a longstanding member of the pan-London NRMM project, funded by the MAQF. Construction Logistics Plans form part of the

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
			new Sustainable Transport Strategy, consulted on in early 2022
21	Emissions from developments and buildings	Reduce emissions from Combined Heat & Power (CHP), including through enforcement of air quality policies on energy sources in new developments	No planning applications were received during 2021-22 or 2022-23 for proposed developments served by biomass boilers, and therefore there were no planning applications for consideration against this action.
22	Emissions from developments and buildings	Enforce Air Quality Neutral policies	Quantitative assessment of the Council's performance against this action can be found in Table J of this report. Assessment of a development's performance against Air Quality Neutral policy is expected of any major development in the borough. Our air quality website clarifies this requirement for developers.
23	Emissions from developments and buildings	Ensure that Air Quality Positive and Healthy Streets approaches are incorporated within future master-planning and redevelopment areas	Healthy streets/ liveable neighbourhood principles have been incorporated throughout two supplementary planning documents (SPD) adopted by the Council - the Sutton Public Realm Design Guide and the Borough Sustainable Transport Strategy A review of the Local Plan commenced in 2022, and will give further consideration to these principles.
24	Emissions from developments and buildings	Ensure adequate, appropriate and well located green space and infrastructure is included in new developments	One of the two major residential permissions granted in 2022 will achieve an uplift in the GSF score of at least +0.2, however both developments meet the Mayor of London’s

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
			urban greening factor (UGF) target in the London Plan 2021.
25	Emissions from developments and buildings	Ensure that Smoke Control Areas are appropriately identified and fully promoted and enforced	The consolidation of historic Smoke Control Orders has been agreed at a council level. Due to vacancies in the responsible team, the consultation was delayed and is due for implementation by Winter 2023.
26	Emissions from developments and buildings	Promote and deliver energy efficiency and energy supply retrofitting projects in workplaces and homes through retrofit programmes such as RE:NEW, RE:FIT and through borough carbon offset funds	In 2022, the Authority commenced delivery of the Social Housing Decarbonisation Fund (Wave 1) to deliver new windows and external and internal wall insulation to 75 Sutton Housing Partnership properties. Sutton was also part of the successful Greater South East Net Zero hub consortium bid for Green Homes Grant Local Authority Delivery (LAD) 2 and LAD 3, as well as Home Upgrade Grant 1, all of which were delivered in 2022. The final reporting of the numbers of homes and measures delivered has not yet been released to Sutton. Sutton council promoted the Solar Together 5 London group purchasing scheme for solar panels and batteries Sutton residents were covered by the Greater London Authority Statement of Intent for Energy Company Obligation Flexible eligibility during 2022.
27	Public health and awareness raising	Director of Public Health to be fully briefed on air quality issues, to sign off Statutory	Ongoing

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
		Annual Status Reports and new Air Quality Action Plans and to support joint working across Council departments on tackling air pollution	
28	Public health and awareness raising	Work with the Public Health Team on stakeholder engagement to raise awareness of health effects of air pollution and reducing exposure	Promotion of active travel messaging, including within the Roundshaw School Superzone, are led by the Public Health team. The Council is part of a Pan London Wood Burning project which includes a communications strategy which raises awareness of the harm caused by solid fuel burning. Sutton will also benefit from an eco-driving training programme being commissioned by Kingston Council and which will be released to all council staff, including a large number of staff who work for various shared services that operate in the two boroughs. The specification for the procurement was developed in 2022.
29	Public health and awareness raising	Engagement with businesses to reduce emissions from associated activities, including employees' travel to/from and within work	No engagement with businesses on behaviour change due to resourcing challenges arising from the TfL/GLA funding award.
30	Public health and awareness raising	Promotion of sources of information about air quality and health including LoveCLeanAir, AirTEXT and Walkit.com and ensuring	The council promotes sources of information about air quality and health through the Air Quality webpages and social media,

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
		people are advised when an air pollution episode is forecast	including pollution episode alerts. Links to AirTEXT and sources of borough level data are published, including the Breathe London project.
31	Public health and awareness raising	Encourage schools to join the TfL STARS accredited travel planning programme and supporting its implementation	We're engaging schools with STARS and including AQ initiatives as part of the travel plan activities. They often take the form of anti-idling campaigns, educating pupils about carbon capture planting, banners on school railings promoting active travel over car use, and school street schemes.
32	Public health and awareness raising	Raise awareness of air quality through education within schools	Schools were asked to run air quality and anti-idling events as STARS activities
33	Localised solutions	Increase use of vegetation and tree planting to help reduce exposure to air pollutants	2022 - 3844 trees planted
34	Localised solutions	Target areas for implementing a package of measures aimed at reducing emissions: Low Emission Neighbourhoods (LENs)	During 2022 four School Streets schemes were planned and are programmed for implementation in Autumn 2023 with a potential for Phase 3 programme in 2024/25.
35	Monitoring and other core statutory duties	Collect and publish air quality monitoring data	LBS air quality monitoring data is available on the Council's website. Our Annual Status Reports are also available via our website. In addition to our permanent monitoring network, further passive monitoring has been carried out in 2022 around specific highway improvements and School Streets through the Breathe London project. Support also given to local community groups seeking to carry out localised monitoring.

Measure	LLAQM Action Matrix Theme	Action	Progress ● Emissions/Concentration data ● Benefits ● Negative impacts / Complaints
36	Monitoring and other core statutory duties	Continue working with Environment Agency on a joint approach to the regulation of waste management sites, including regular inspections and reviews of monitoring data	Representatives of the Borough's Pollution Control Team regularly attend the Beddington ERF Community Liaison Group, which the Environment Agency is invited to. Monitoring data on the operators website is reviewed regularly and the council inputted into the consultation on the Permit Variation submitted in late 2022.

3.0 Planning Update and Other New Sources of Emissions

Table J. Planning requirements met by planning applications in London Borough of Sutton 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	27
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	4
Number of developments where an AQ Neutral building and/or transport assessments undertaken	9
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	2
Number of planning applications with S106 agreements including other requirements to improve air quality	1
Number of planning applications with CIL payments that include a contribution to improve air quality	0
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered through the NRMM webpage and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	10 conditions included 22 registered and compliant 0 unregistered/non compliant, and being chased.

The London Borough of Sutton Planning Department consults the Pollution Control Team on all major planning applications as well as some non-major applications that are likely to be of interest. Applications are reviewed by officers within the team in respect of contaminated land, noise and air quality. Typically, one officer coordinates the team's response and records data such as the air quality conditions that were recommended.

The enforcement of air quality conditions is largely the responsibility of the Planning Enforcement Team unless environmental nuisance issues arise. However, NRMM enforcement is carried out by the LB Merton-led pan-London NRMM enforcement project, funded by the Mayor's Air Quality Fund with Borough contributions.

3.1 New or significantly changed industrial or other sources

No new sources identified

4.0 Additional Activities to Improve Air Quality

4.1 London Borough of Sutton Fleet

There are currently no zero emission and zero emission capable vehicles within the borough's fleet.

4.2 NRMM Enforcement Project

London Borough of Sutton continued to support the NRMM Enforcement project in 2022.

4.2 Air Quality Alerts

The Council website promotes the AirTEXT service as well as recommends ways in which residents can reduce their exposure to and emissions of, air pollution. The Council has also shared pollution episode alerts from the GLA forecasting service.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

The Council's monitoring stations form part of the London Air Quality Network, and QA/QC standards are delivered accordingly. These are considered close, if not equivalent to, the AURN standards. QA/QC is carried out by contractors.

PM_{10} Monitoring Adjustment

The monitoring stations in the London Borough of Sutton are part of the London Air Quality Network, and the data is collected and managed (including ratification) by ERG (Environmental Research Group) at Imperial College, London.

A.2 Diffusion Tubes

The diffusion tubes used by the London Borough of Sutton are supplied and analysed by Gradko utilising the 20% triethanolamine (TEA) in the water preparation method. A bias adjustment factor of 0.84 for the year 2022 has been derived from the national bias adjustment calculator dated June 2023.

London Borough of Sutton did not conduct any co-location studies in 2022, so it was not possible to calculate a local adjustment factor. As a result, the national adjustment factor of **0.84** is applied to diffusion tube monitoring results in this report.

Gradko International Ltd is a UKAS-accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. Gradko previously participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO2 diffusion tube analysis Page 38 and the Annual Field Inter Comparison Exercise. In April 2014, a new scheme, AIR PT13, was introduced. This is an independent analytical proficiency-testing (PT) scheme operated by LGC Standards and supported by the

Health and Safety Laboratory (HSL). AIR PT combines two long-running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

Laboratory performance in AIR PT is also assessed by the National Physical Laboratory (NPL) alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a ‘z’ score. A score of 2 or less indicates satisfactory laboratory performance.

Gradko International Ltd.’s performance for 2022 for 100% of samples submitted by Gradko was deemed satisfactory.

The laboratory has also achieved a “good” precision result for 2022. Tubes are considered to have "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is less than 10%.

Table K. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	06/23	0.84
2021	National	03/22	0.84
2020	National	03/21	0.81
2019	National	03/20	0.93
2018	National	03/19	0.93
2017	National	03/18	0.89
2016	National	04/17	0.94

National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 06/23

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 spreadhseet 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 September 2023

LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List

If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List

If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List

If a year is not shown, we have no data[2]

Step 4:

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

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

Analysed By[1]	Method (To add your selection, choose [All] from the pop-up list)	Year[5] (To add your selection, choose [All])	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m^3)	Automatic Monitor Mean Conc. (Cm) (µg/m^3)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Lancaster City Council	13	34	27	25.8%	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	KS	Cheltenham Bc	12	29	27	7.1%	G	**0.93**
Gradko	20% TEA in Water	2022	UI	Crawley Borough Council	9	21	20	1.1%	G	**0.99**
Gradko	20% TEA in Water	2022	R	Dudley Mbc	11	29	25	13.6%	G	**0.88**
Gradko	20% TEA in Water	2022	R	Dudley Mbc	11	42	38	10.5%	G	**0.90**
Gradko	20% TEA in Water	2022	UB	Dudley Metropolitan Borough Council	12	21	15	38.1%	G	**0.72**
Gradko	20% TEA in Water	2022	R	Nottingham City Council	9	32	36	-9.8%	G	**1.11**
Gradko	20% TEA in water	2022		**Overall Factor[3] (33 studies)**				**Use**		**0.84**

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.
In 2022, all automatic monitoring sites had data capture of 75% or more. No annualisation was required.

One non-automatic (diffusion tube) monitoring site was annualised. Site ST40 had a data capture of 58%.

Site ST40 was annualised using automatic monitoring site ST6 (96% data capture) with an annualisation factor of 0.985.

Distance Adjustment

The continuous NO2 monitoring site of ST4 and ST6 as well as the NO2 diffusion tube monitoring site ST39 were exceeding the AQO of 40 µg/m3. Annual mean NO2 concentrations for these sites were calculated at relevant exposure receptors using the NO2 fall-off with distance calculator.

ST4, ST6, and ST39 calculated annual mean concentrations are not within 10% of the NO2 annual objective of 40µg/m3 (i.e. above 36µg/m3), which accounts for the inherent uncertainty in monitoring concentration data.

Table L. NO_2 Fall off With Distance Calculations

The results presented in the table below are after adjustments for bias adjustment, annualisation and distance to a location of relevant public exposure. To estimate the concentration at the nearest receptor, the procedure is specified in LLAQM.TG(16) has been applied to all monitoring locations that record an annual mean concentration above the NO2 annual mean objective of 40ug/m3.

The calculation has also been applied to monitoring locations that record an annual mean concentration that is within 10% of the NO2 annual mean objective (i.e. above 36ug/m3), to account for the inherent uncertainty in diffusion tube monitoring data.

Site ID	Distance (m) Monitoring Site to Kerb	Distance (m) Receptor to Kerb	Monitored Concentration Annualised and Bias Adjusted (µg m^{-3})	Background Concentration (µg m^{-3})	Concentration Predicted at Receptor (µg m^{-3})	Comments
ST4	0.8	5.8	44.23	14.14	32.7	Predicted concentration at Receptor within 10% of the AQO
ST39	2.0	8.0	40.74	16.83	33.0	Predicted concentration at Receptor within 10% of the AQO
St6	1.3	2	39.87	15.5	37.6	Predicted concentration at Receptor within 10% of the AQO

The calculations have been carried out in accordance with LLAQM Technical Guidance in order to provide information on the concentrations at which relevant exposure occurs. The data shows that there is just one exceedance of the annual mean objective at an area of relevant exposure and this is a location adjacent to a busy road. This site has been identified in the previous ASR's.

Appendix B Full Monthly Diffusion Tube Results for 2022

Table M. NO_2 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
ST21	100	100	35.69	20.47	32.30	21.51	18.49	16.29	16.48	21.89	23.75	25.88	25.74	30.65	24.09	20.24
ST22	83	83	**41.95**	-	32.03	26.09	25.99	24.73	25.88	-	29.22	28.83	31.35	31.99	29.81	25.04
ST23	100	100	**42.06**	26.99	**41.51**	32.47	26.40	24.12	29.14	35.03	34.66	29.17	30.26	35.25	32.25	27.09
ST24	100	100	**48.65**	14.91	31.17	24.63	15.94	14.17	15.38	23.96	25.10	22.13	24.65	29.58	24.19	20.32
ST25	100	100	**41.24**	27.62	30.23	23.30	21.52	19.87	20.54	22.05	27.40	26.52	27.89	34.69	26.90	22.60
ST26	92	92	**45.02**	29.34	32.66	27.01	27.96	25.21	26.15	29.01	31.80	30.40	-	36.69	31.02	26.06
ST07	100	100	30.67	14.74	28.84	19.61	14.45	10.95	11.75	17.57	20.19	17.38	18.61	25.81	19.21	16.14
ST08	100	100	33.37	16.77	25.38	17.69	16.53	14.31	14.25	17.98	22.99	20.62	21.74	27.35	20.75	17.43
ST29	100	100	**51.84**	33.80	**48.73**	42.08	36.38	36.20	37.26	**44.84**	**41.52**	39.52	**40.50**	**42.18**	41.24	34.64
ST10	100	100	28.34	14.01	25.28	15.91	12.37	9.51	10.79	15.17	17.55	16.69	17.51	26.04	17.43	14.64
ST11	83	83	35.13	19.32	27.50	19.32	16.79	13.88	-	-	23.42	22.52	24.71	28.99	23.16	19.45
ST32	100	100	30.71	15.31	32.77	22.38	16.77	15.16	15.25	18.57	23.96	21.23	22.05	25.77	21.66	18.20
ST33	100	100	**44.61**	26.50	**47.37**	32.24	30.76	28.96	29.32	36.47	38.78	35.89	**40.13**	**42.87**	36.16	30.37
ST34	100	100	**49.53**	36.61	36.35	28.68	38.75	36.06	36.14	33.13	**41.03**	39.44	**41.01**	**41.77**	38.21	32.09
ST35	100	100	36.92	23.53	33.10	22.84	20.44	20.42	20.80	23.85	27.23	25.04	28.79	31.24	26.18	21.99

ST36	100	100	**40.38**	20.96	36.96	23.59	22.08	18.48	22.93	28.75	30.14	24.88	27.76	32.32	27.44	23.05
ST27	92	92	**51.82**	27.84	**46.97**	33.84	25.70	24.59	-	36.71	38.62	32.28	34.15	**40.80**	35.76	30.04
ST38	100	100	**41.69**	23.42	**40.09**	33.04	28.09	29.32	30.94	36.69	36.73	28.62	29.01	34.87	32.71	27.48
ST39	100	100	**69.27**	**40.83**	**52.17**	**40.41**	**48.50**	**46.26**	**44.51**	**46.48**	**54.18**	**45.06**	**44.55**	**49.75**	**48.50**	**40.74**
ST40	58	58	**52.37**	-	-	39.24	37.72	-	35.52	**44.20**	-	-	39.74	**41.70**	**40.87 (41.50)**	34.33 (34.86) *Ann
ST42	92	92	30.92	13.84	25.26	15.88	-	9.09	9.95	17.49	17.85	14.58	16.46	25.99	17.94	15.07
ST43	100	100	**42.40**	27.71	32.31	25.02	24.01	20.26	20.17	23.10	30.45	28.30	33.89	34.00	28.47	23.91
H1	100	100	**46.48**	30.30	39.92	29.86	27.80	25.70	26.08	29.79	33.41	30.92	33.09	38.97	32.69	27.46
H2	100	100	33.11	20.87	28.95	19.65	17.97	16.59	17.08	19.68	23.05	22.92	23.75	28.60	22.68	19.05
H3	100	100	**56.84**	**40.22**	**43.63**	32.31	38.00	33.35	35.38	33.97	**41.34**	38.80	**44.59**	**41.56**	40.00	33.60
BL	75	75	**47.54**	31.06	37.26	-	-	34.58	31.96	-	35.95	29.91	**44.45**	**40.64**	37.04	31.11

Notes

Concentrations are presented as µg m^{-3}.

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

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

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%. Annualised data is marked with an asterisk and unadjusted data is shown in the 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%).

Appendix B Data Annualisation for 2022

ST40 mean annual data was annualised as the data capture was below 75%.

ST40 was annualised using data from continuous data monitoring site ST6.

ST40 data was available for the months January, April, May, July, August, November, and December.

ST40 Mean (M) was 41.50 µg m^{-3}.

ST6 data had a 96% annual data capture.

Period Mean (Pm) for ST6 is the NO_2 data for the months January, April, May, July, August, November, and December.

ST6 Pm was 40.49 µg m^{-3}.

The Annual Mean (Am) for ST6 is the annual NO_2 data be 39.87 µg m^{-3}.

Ratio (Ra) = Annual Mean / Period Mean = Am/Pm

Ra = 39.87 µg m^{-3} / 40.49 µg m^{-3} = 0.98

ST40 annualised mean is the ST40 Mean (M) multiplied by Ratio (Ra)

Annualised mean = M x Ra = 41.50 x 0.98 = 40.87

The ST40 annualised mean BEFORE bias adjustment was 40.87 µg m^{-3}. The ST40 annualised mean after bias adjustment was 33.92 µg m^{-3}.