

London Borough of Barnet Air Quality Annual Status Report for 2021

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The Archer, Eric Aumonier, 1940. Photo; Thierry Bal, 2016, East Finchley Station

This report provides a detailed overview of air quality in the London Borough of Barnet during 2021. 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
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 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

1. Air Quality Monitoring

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2021

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 (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
ABN1	Tally Ho	526344	192219	Kerbside	Y	5	0.5	3	NO ₂ , PM10	Chemiluminescent; TEOM
ABN2	Chalgrove School	524374	189642	Urban Background	Y	0	N/A	2.5	NO ₂ , PM10	Chemiluminescent; TEOM

Table C. Details of Non-Automatic Monitoring Sites for 2021

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 (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
PBN1	1 Pointalls Close	Roadside	X526278 Y190444	NO ₂	Y	6	13	2.5	NO ₂	N
PBN2	71 Ballards Lane	Urban Centre	X525410 Y190980	NO ₂	Y	0 ¹	4	2.5	NO ₂	N
PBN3	Sanders Lane Allotments	Urban background	X523754 Y191588	NO ₂	Y	N/A	N/A	2.0	NO ₂	N
PBN5	St James Catholic High School	Urban background	X521885 Y190489	NO ₂	Y	5	2	2.5	NO ₂	N
PBN6	355 Hendon Way*	Roadside	X523102 Y188205	NO ₂	Y	8	1	2.5	NO ₂	N
PBN8	Tally Ho monitoring station	Urban Centre	X526346 Y192224	NO ₂	Y	5 ¹	0.5	2.5	NO ₂	Y
PBN9	52 Golders Green Road	Urban Centre	X524965 Y187505	NO ₂	Y	0 ¹	5	2.5	NO ₂	N
PBN10	High Street, Barnet	Urban Centre	X524496 Y196615	NO ₂	Y	0 ¹	3	2.5	NO ₂	N
PBN12	1295 High Road Whetstone	Urban Centre	X526381 Y194059	NO ₂	Y	0 ¹	10	2.5	NO ₂	N
PBN13	Courtland Avenue, A1	Roadside	X520968 Y193457	NO ₂	Y	6	22	2.5	NO ₂	N
PBN14	William Hill, Station Road Edgware	Urban Centre	X519497 Y192075	NO ₂	Y	0 ¹	5	2.5	NO ₂	N

PBN17	National Express Bus Stop, Golders Green Bus Station	Bus station	X525207 Y187425	NO ₂	Y	0 ¹	N/A	2.5	NO ₂	N
PBN18	Rear of GG Bus Station	Bus station	X525278 Y187444	NO ₂	Y	0 ¹	N/A	2.0	NO ₂	N
PBN19	Rear of 7-12 Dyson Court, Tilling Road	Roadside	X523348 Y187589	NO ₂	Y	0 (façade of residential building)	10	2.5	NO ₂	N
PBN20	Flats above 16 Cricklewood Lane	Urban Centre	X523885 Y185764	NO ₂	Y	0 (façade of residential building)	6	6	NO ₂	N

* This location had to be slightly modified, as the original monitoring location was no longer available.

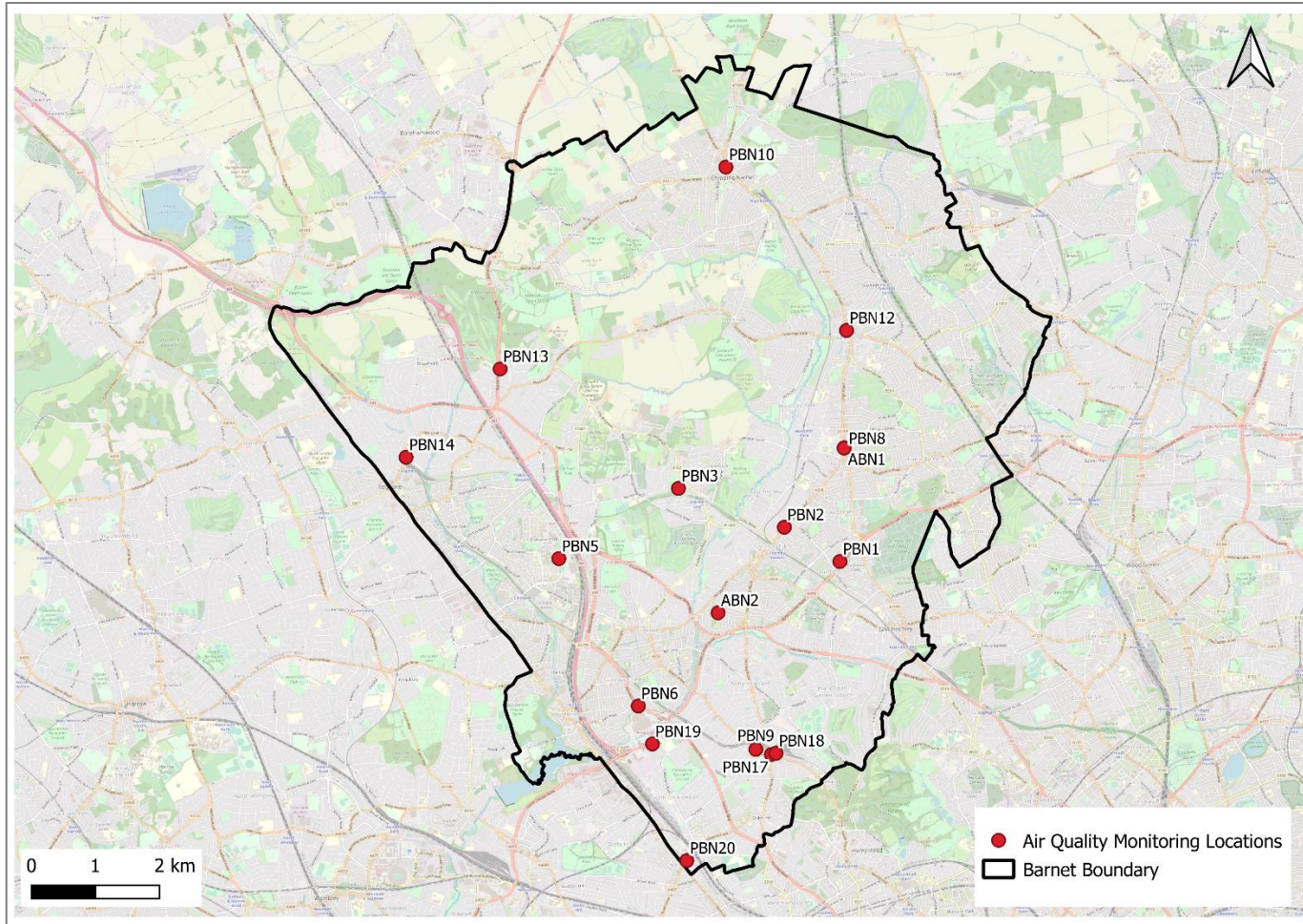


Figure 1-1 Monitoring Locations in Barnet. Higher resolution images of the diffusion tube and automatic monitoring locations can be found in Appendix B.

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.

The following site’s location had to updated, and distance corrected: PBN6 355 Hendon Way (formerly 349 Hendon Way).

Calculations for annualisation are in Appendix A.

Results prior to annualisation are in Appendix B.

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 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ABN1	Automatic	98.32	98.32	46.2	38.8	50.0	35.9	38.0	32.0	32.0
ABN2	Automatic	98.46	98.46	23.0	28.0	29.0	27.0	25.0	19.0	18.0
PBN1	Diffusion tube	90.1	90.1	37.1	38.9	34.9	36.8	31.4	21.6	23.5
PBN2	Diffusion tube	100.0	100.0	43.7	46.7	40.5	39.8	35	24.6	29.6
PBN3	Diffusion tube	90.9	90.9	21.5	22.3	21.0	20.0	15.5		12.8
PBN5	Diffusion tube	100.0	100.0	27.9	30.5	27.7	28.8	25.1		18.9
PBN6	Diffusion tube	92.8	92.8	41.7	50.6	49.5	41.4	37.5	33.1	35.6

Site ID	Site type	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
PBN8	Diffusion tube	100.0	100.0	41.7	45.1	41.25	37.7	37.1	29.9	32.7
PBN9	Diffusion tube	100.0	100.0	48.4	53.5	43.8	43.5	39.9	27.7	36.6
PBN10	Diffusion tube	100.0	100.0	51.0	55.7	51.1	44.0	38.6	27.5	32.8
PBN12	Diffusion tube	92.6	92.6	47.0	50.8	46.3	39.0	39.1	29.5	31.1
PBN13	Diffusion tube	100.0	100.0	36.7	34.2	30.1	29.3	27.4	19.7	19.4
PBN14	Diffusion tube	91.7	91.7	55.7	54.7	50.9	50.4	41.6	35.5	40.5
PBN17	Diffusion tube	100.0	100.0	<u>64.5</u>	58.4	50.8	46.8	38.9	29.3	33.8
PBN18	Diffusion tube	90.1	90.1	51.8	50.3	50.4	40.3	37.5		36.1
PBN19	Diffusion tube	100.0	100.0	52.3	52.2	49.1	47.2	41.6	29.3	34.7
PBN20	Diffusion tube	100.0	100.0	54.6	55.3		43.1	38.7	31.0	29.6

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%).

Discussion of data trends; Overview

The 7-year trend (2015-2021) reports and overall decrease in the ambient concentrations of NO₂ at all monitoring locations. In 2021, only one location returned a nitrogen dioxide concentration higher than the national air quality objective; 40.5 µg m⁻³ was measured at PBN14 (William Hill Station Road, Edgware).

Concentrations of NO₂ measured by diffusion tubes in 2021 were, as expected, greater than what was measured in 2020 in several locations. This is attributable to the overall increase in traffic flows as national measures to reduce the impact of the pandemic were scaled back to allow the public to begin to return to pre-2020 activity levels. It is noted however, that there will likely be lasting behavioural changes among the public as a result of the pandemic (e.g., flexible working/working from home, and the perceived shift in “rush hour” travel periods) which will have a long lasting and potentially permanent impact on air quality in Barnet.

Also of note, is that the final quarter of 2021 is marked by the expansion of the London Ultra Low Emission Zone (ULEZ) up to the North Circular Road (A406), which may also be a driver for the reduction of NO₂ in parts of Barnet within the A406. More time is required to ascertain the impacts of the ULEZ on the distribution of ambient NO₂ concentrations within the borough.

The next meaningful year of data to compare to is 2019, prior to the pandemic; in 2021 all locations, with the exception of one (PBN6 355 Hendon Way), reported a decrease in NO₂ concentrations in comparison to the results for 2019.

Discussion by Site Type

Urban Background/Background Locations

Concentrations at Sanders Lane Allotments and St James Catholic School have continued to decrease over the years, which a further reduction of 17 % (2.7 µg m⁻³) and 30 % (8.4 µg m⁻³) respectively since 2019. Given that these locations are not heavily influenced by traffic, the general reduction in NO₂ concentrations can be indicative of an overall improvement in air quality in the area; this includes reduced impacts from sources of NO₂ such as heating.

Golders Green Bus Station

Concentrations of nitrogen dioxide for 2021 are less than what was measured in 2019. The monitor at the rear of the bus station reported a decrease of 3.7 % (1.4 µg m⁻³) and the monitor at the National Express bus stop reported a decrease of 13.2 % (5.1 µg m⁻³). It is possible that changes to the timetable/frequency of coaches and buses at the bus station due to the COVID-19 pandemic could be the driver for these decreases, along with related behavioural changes in the public's usage of transport modes. As expected, the results for 2021 are significantly greater than 2020 given the impact of the national lockdown; a 15 % increase in nitrogen dioxide concentrations from 2020 to 2021 was found at the National Express monitor.

The annual air quality objective has been met at the monitors within the Golders Green Bus Station since 2019, and the concentrations have been below 60 µg m⁻³ (indicative limit for the hourly NO₂ objective) since 2016. There may be potential to revoke the Air Quality Management Area (AQMA) for hourly mean nitrogen dioxide concentrations in this location in the future.

High Street Locations

All high street locations in 2021 reported a decrease in NO₂ concentration in comparison to 2019 results. All monitoring sites also showed the expected increase in concentrations when compared to the 2020 results.

The greatest reduction in NO₂ concentrations since 2019 is observable at PBN12 1295 High Road Whetstone: a reduction of 18.3 % (7.0 µg m⁻³).

The only monitoring location to return a concentration higher than the national air quality objective was measured at PBN14 William Hill, 218 Station Road Edgware. There was a minor decrease in ambient NO₂ concentrations when compared to 2019 data, of 2.7 % (1.1 µg m⁻³). This part of Edgware is local hub for business and transport; the bus station and taxi rank, located in the middle of the road, along with a plethora of shops and restaurants mean that the area attracts people (and therefore traffic). As Edgware is located outside of the A406, it is not subject to the restrictions on polluting vehicles provided by the ULEZ. Also, Edgware would have continued to be an important transport hub during the national lockdown in 2020, hence why the level of NO₂ did not reduce as drastically as other high-street locations.

For comparison, PBN8 Tally Ho! Monitoring station monitor is also located close to a bus station, a location which can experience heavy traffic, and not subject to the ULEZ, however has shown a 13.9 % decrease in NO₂ concentrations since 2019. The differences between PBN14 and PBN8 (as well as other high street locations) can be attributed to the physical characteristics of each site and its surrounds (PBN8 is wider, has no taxi rank, and no underground station when compared to PBN14), and the behaviours associated with these features.

Overall improvements to the air quality in high-street areas in 2021 will likely be a result of the general improvements in clean engine technologies, and behavioural changes in the public as an artefact of the COVID-19 pandemic.

Residential properties on major roads

There are several areas in Barnet where residential properties are located adjacent to busy roads. These routes are heavily utilised by all vehicles and are essential routes for private and public transport, and HGVs serving large regeneration projects in Barnet, such as the Brent Cross Regeneration project. As construction sites reopened and the most stringent pandemic restrictions were lifted, the predictable increase in ambient NO₂ concentrations has occurred, but overall, concentrations remain below 2019 concentrations in all locations.

The only monitoring location that reported a decrease in NO₂ concentration since 2020 was PBN20 (Flats above 16 Cricklewood Lane), which reported a decrease of 4.5 % (1.4 µg m⁻³) in NO₂ concentrations in 2021, when compared to 2020. This location was one of the worst for residential exposure in Barnet prior to 2018, however has shown marked improvements since then.

PBN6 355 Hendon Way (A41) reported the highest concentration of NO₂ in 2021 of all major road monitoring locations. Measurements at this location were interrupted, when the signpost the diffusion tube was mounted on was removed. While distances between the road, diffusion tube, and receptor remain similar in the new location, the monitor has moved slightly closer to a junction.

The traffic on the A406 is the main source of pollution which is monitored PBN1 (Pointalls Close) and PBN19 (Dyson Court). Concentrations at Dyson Court fell below the national air quality objective for the first time in 2020, and this has continued into 2021; the expected increase in pollution concentrations occurred between 2020 and 2021, however concentrations in 2021 are approximately 16 % (6.9 µg m⁻³) lower than in 2019. Dyson Court is one of the worst locations for residential exposure, however the

concentrations have not returned to pre-pandemic levels. Concentrations of ambient NO₂ at Pointalls close have remained below the air quality objective for the past 7 years and remain on a downward trajectory.

Given the nature of these areas, the opportunities for improvement are few; there are high traffic volumes and periods of heavy congestion, and these routes tend to carry a high proportion of large vehicles (HGVs). TfL is the authority which generally looks after these routes, so any changes with the aim of improving air quality would be led by them. Beyond this, general improvements to engine technology allowing vehicles increase to run “cleaner”, will play a role in reducing pollutant concentrations. The implementation of the ULEZ may also have an impact, as these routes are often used to reach areas of London within the A406.

Trends in annual mean nitrogen dioxide concentrations at diffusion tube monitoring locations in Barnet

7 Year Trend in Nitrogen Dioxide Concentrations

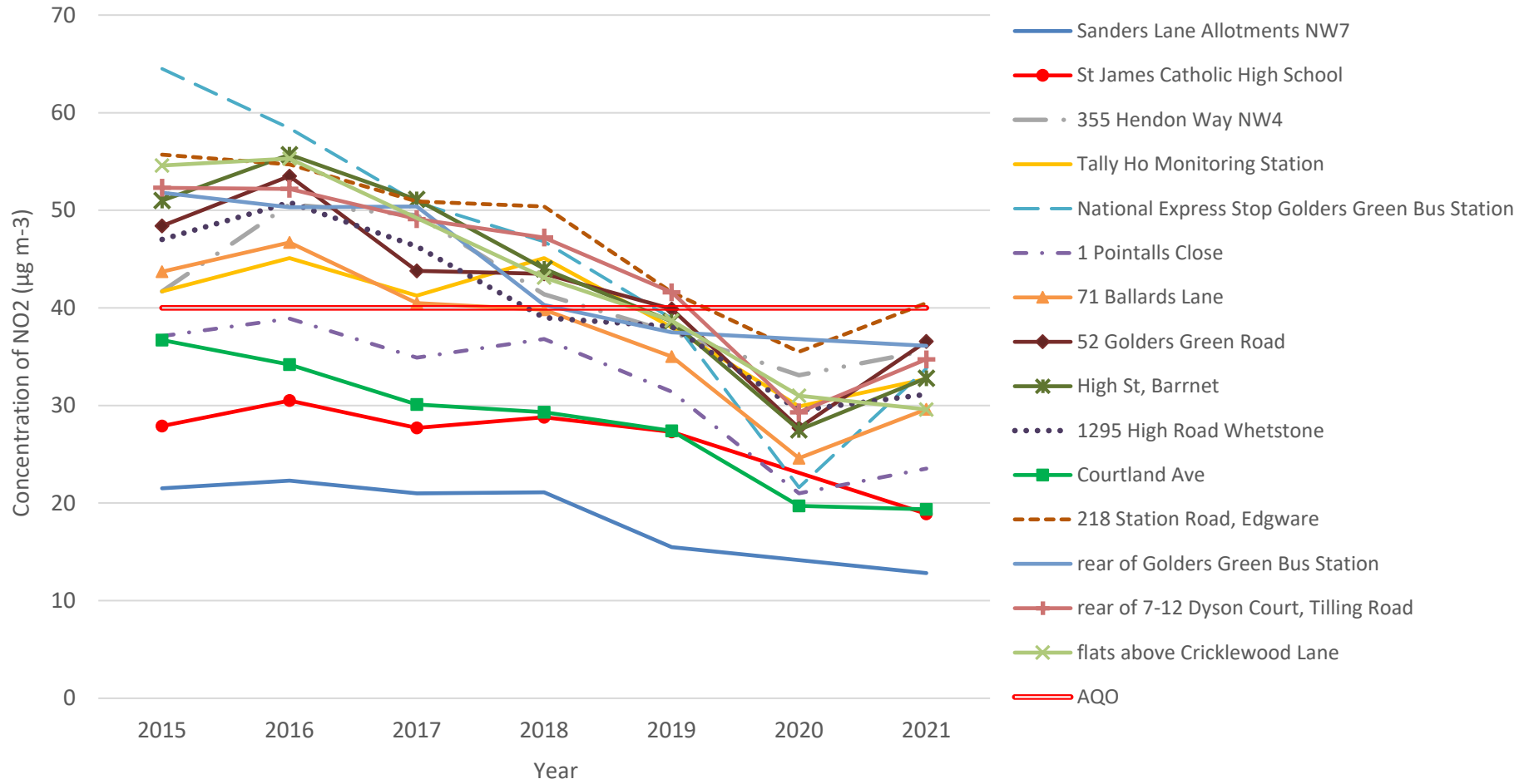


Table E. NO₂ Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m⁻³

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ABN1	98.46	98.46	9 (136)	0	1	0	0	0	0
ABN2	98.32	98.32	0 (92)	0	1	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%)

Table E illustrates that there were no exceedances of the 200 µg m⁻³ hourly mean National Air Quality Objective for NO₂ recorded at either automatic monitoring site in 2021.

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

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ABN1	99.20	99.20	22	23	21	21	20	19	17
ABN2	96.99	96.99	18	18	18	17	17	17	14

Notes

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

Exceedances of the PM_{10} annual mean AQO of $40 \mu\text{g m}^{-3}$ 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%).

Table F illustrates that the annual mean concentration of PM_{10} at both monitoring sites remains below the objective. There is a gradual yearly decrease in PM_{10} for the sites over the last 7 years well below the annual mean. The roadside Tally Ho site did regularly exceed the annual mean over 10-15 years ago.

We are considering whether due to these results and new objectives for $\text{PM}_{2.5}$ if further monitoring is necessary.

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 2021 % ^(b)	2015	2016	2017	2018	2019	2020	2021
ABN1	99.20	99.20	4 (35)	6 (32)	1	4	1	1	0
ABN2	96.99	96.99	3	4 (29)	1	3	1	1	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%).

Table G illustrates that the levels of PM₁₀ at both monitoring sites continue to comply with the daily mean objective. There is an overall reduction in instances where the PM₁₀ 24-hour mean has exceeded 50 µg m⁻³ since 2015. No instances were recorded in 2021. The number of exceedances is dependent on the instances of air pollution episodes, which are usually caused by weather conditions such as prolonged periods of low wind/fog. Rain typically results in less pollution since it dampens down and washes out particulate matter in the air and can also wash out pollutants that are dissolvable. Generally, the higher the precipitation, the lower the concentration of particulate matter.

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

We do not currently measure PM_{2.5} at our automatic monitors in Barnet, however, as part of the *Breathe London Project* we have installed air quality node monitors at several locations within the borough, which measure ambient PM_{2.5} data along with NO₂.

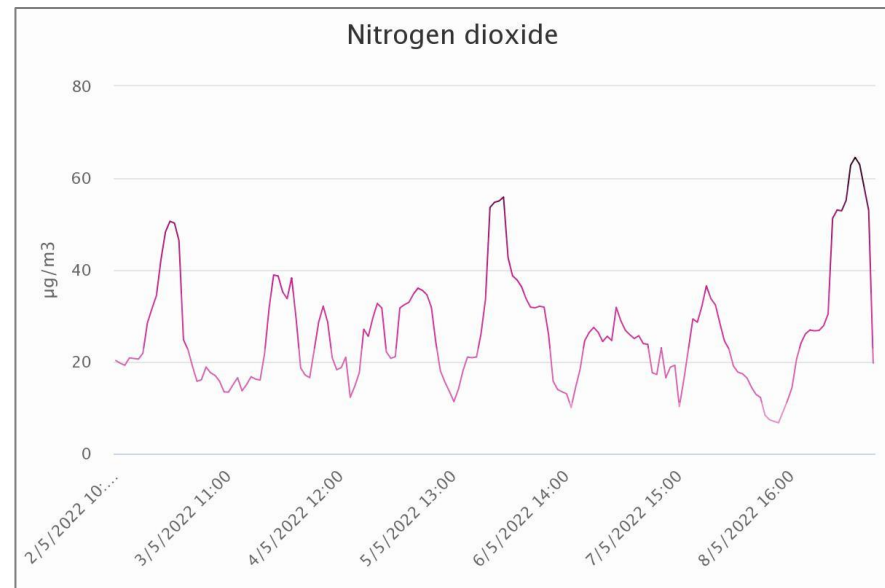
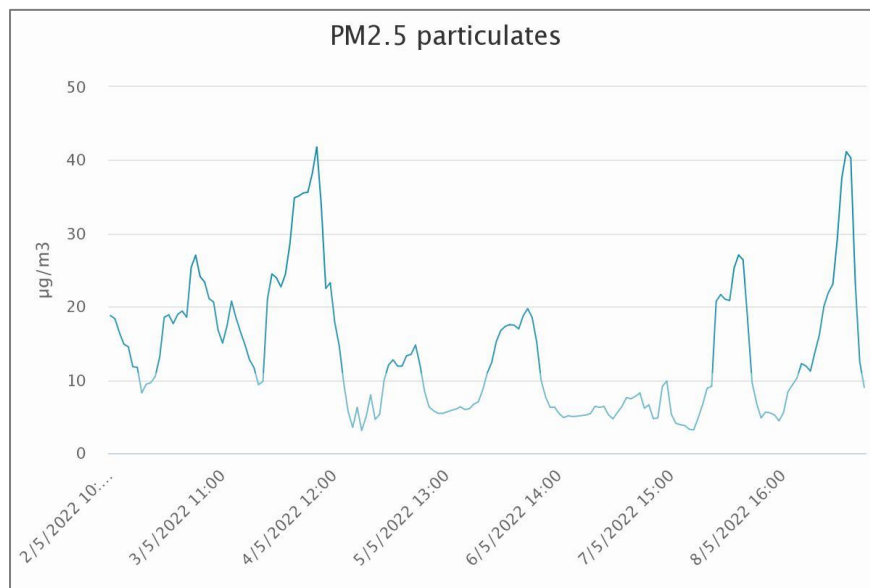
These locations are as follows:

- Martin Primary School
- Wessex Gardens Primary School
- The Orion Primary School
- Cat Hill Allotments

Data is typically observable over a period of a week. See below for examples of data output from the node monitor at the Orion Primary School

Further information on the project, node monitors, and monitoring data can be found at the following web address:

<https://www.breathelondon.org/>



2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a summary of the London Borough of Barnet's progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2021 are shown at the bottom of the table. Continuing projects include the A1000 scheme, an experimental A1000 cycle lane which was built in 2020. Air quality monitoring on the A1000 commenced in February 2021. For further information, refer to Actions 17 and 22. The current action plan (Air Quality Action Plan 2017-2022) is due for revision this year, and we are currently evaluating the measures included in the current action plan. Below are updates from the 2020 ASR.

More information on the current action plan (2017-2022) can be found at the following web address:

<https://www.barnet.gov.uk/environmental-problems/air-quality/air-quality-action-plan>

Table J. Delivery of Air Quality Action Plan Measures

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
Minimise dust emissions from construction sites	Emissions from developments and buildings	1	<p>Number of dust complaints received in 2021: 34 This figure includes dust from demolition & construction, as well as dust from industrial and commercial activities. Officers continue to respond to complaints of dust from construction sites and will investigate and take appropriate action using the Environmental Protection Act 1990</p>
Enforce Non-Road Mobile Machinery (NRMM) air quality policies	Emissions from developments and buildings	2	<p>Number of planning applications where NRMM condition was applied in 2021: 30 Further increase in mention of NRMM in Construction management plans in 2021. Significant increase on 2021 now that NRMM conditions are required for all applications. The North London NRMM project concluded in 2019; Barnet has extended the project, led by L. B. Merton, until 2022. In 2021, Cleaner Construction for London undertook 44 audits in L.B. of Barnet. By the end of the year 14 sites exceeded emission standards and registered all machinery correctly prior to the audit; 7 sites were non-compliant before audit but met required emission standards by enacting all recommendations made by officers; 14 sites upon arrival were completed; and 6 sites had no NRMM within scope presently deployed. 41% of sites audited were unregistered and subsequently engaged.</p>
Enforce CHP and biomass air quality policies	Emissions from developments and buildings	3	<p>Total number of applications received in 2021: 898 CHP/Biomass boiler: no applications received. Instead, there is an increased uptake of air/ground source heat pumps and PV solar. All new CHP plan must comply with the mayor's emissions requirement and the team will ensure this through the planning process.</p>
Enforce Air Quality policies and monitor sustainable Travel Plans for developments	Emissions from developments and buildings	4	<p>898 planning applications were assessed by Scientific Services in 2021; 6 applications required an air quality report condition, and a further 61 requiring air quality mitigation measures to be put in place. 2021 also saw more changes in personnel, so the true number of conditions placed is greater. Air quality reports are often submitted as part of initial applications; this data is not recorded, so the number of applications with air quality assessments is greater. Further discussion will occur regarding how we retain this information within our database. It must also be noted that air quality levels have steadily improved. No applications were recommended for refusal by Scientific Services on grounds of insufficient evidence of how poor air quality would be mitigated.</p>
Increase planting of green barriers and vegetation	Localised Solutions	5	<p>Barnet's Tree Policy is ground-breaking in England. Barnet planted in total across whole borough 1009 trees in winter 2021/22. Scientific Services continue to share information and data with Trees and Woodlands manager on where air quality hotspots and worst affected schools are. Trees were planted in many areas including: Exeter Road and Hampden Way in Southgate; Dale Green Road in New Southgate; Colney Hatch Lane; Haselmere Avenue, and Oak Hill Park in East Barnet, and Brunswick Park; Russel</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
			Lane and Oakleigh Road North in Whetstone; Dunstan Road, and Brookland Road in Golders Green; Ridge Road and Child's Hill Park in Childs Hill, Cloister Road, and Purley Avenue in Cricklewood; Bethune Recreation Ground and Halliwick recreation Ground; Poolsford Road, and Portman Gardens in Colindale; Church Lane, and Oak Lane Open Space in East Finchley; Broadfields Avenue in Edgware, and Edgwarebury Park; Beaufort Park; Glenwood Road and Hale Drive in Mill Hill; Meadway Open Space in High Barnet; Dollis Valley Greenwalk; and Swan Lane Open Space in Totteridge.
Enforce Smoke Control Areas	Emissions from developments and buildings	6	Number of complaints of smoke from chimneys in 2021: 9 Number of enforcement actions: None, all were settled though informal action to secure compliance.
Regularly brief Director of Public Health (DPH) on air quality issues in Barnet; what is being done, and what is needed.	Public Health and awareness raising	7	<p>The Barnet ICP has a responsibility to take actions forward to support health and wellbeing within its anchor institutions. Clean Air Day 2021 saw partners from the ICP as well as schools, come together to talk about cleaner air. The Barnet Public Health team also worked closely with Barnet Hospital colleagues on the implementation of their sustainability strategy, encouraging staff to walk and cycle to work and supporting cycle storage infrastructure at Barnet Hospital sites. We will continue to work closely with Barnet's anchor institutions to ensure we are leading by example and raising awareness of air quality.</p> <p>In addition, Public Health staff are members of the Air Quality steering group, enabling regular communication and updates on air quality actions to be shared with the Director of Public Health.</p>
Director of Public Health to sign off statutory Annual Status Reports and all new Air Quality Action Plans	Public Health and awareness raising	8	Director of Public Health to sign off statutory Annual Status Reports and all new Air Quality Action Plans
Encourage schools to join the TfL STARS accredited travel planning programme by providing information on the benefits to schools and supporting the implementation of such a programme	Public Health and awareness raising	9	<p>The number of accredited schools in 2021 is 103 (compared to 106 in 2020), including 11 new Gold STARS accreditations. This minimal loss is likely due to schools focussing on COVID related concerns all through 2019 and 2020, however most schools still found the time to promote active travel thanks to the school travel team's support to schools through the pandemic.</p> <p>In 2021, 21 schools registered to take part in the national active travel competition The Big Peddle</p>
Air quality projects with schools	Public Health and awareness raising	10	Air quality project contract with Sustrans (a UK walking and cycling charity and custodian of the National Cycle Network) was signed in 2021. This includes delivery of 3 sessions in up to 15 schools across the borough. 6 schools have had workshops delivered so far: Colindale primary, Ashmole primary, St Agnes primary, Fairway primary, All Saints NW2 primary school, and Wren Academy.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
			<p>The workshop themes and activities include Lichen investigation, air quality banner competition, air quality posters, pupil-led feedback assemblies, and writing a letter to an MP on air quality.</p>
Schools Audits at schools in poor air quality areas	Public Health and awareness raising	10.2	<p>A further School Audit has been planned for 2022 at Martin Primary School, with a view to encourage more schools to take up the opportunity. Schools in locations which are close to the annual ambient NO2 concentrations limit or are near busy roads will be contacted again to gauge interest in the AQ School Audit process. Increased awareness of air quality issues among the public may be a factor to encourage future participation among small private and faith-based schools.</p>
Idling projects	Public Health and awareness raising	10.3	<p>No anti-idling events took place in 2021. However, asthma-friendly schools action plan, Barnet's sustainability framework & the publication of the joint health and wellbeing strategy means that we are in a strategic position to take forward anti-idling action in the next financial year. Public Health has also coordinated the air quality communications plan for the next financial year to ensure a joined-up approach across all departments is taken. We will ensure anti-idling projects are planned in line with Clean Air Day 2022.</p>
Public Health and Environmental Health Joint Communications Plan	Public Health and awareness raising	10.4	<p>Director of communications has agreed to publicise moderate and high air quality episodes, with links to our live air monitoring data on the air quality England website. The Barnet website, Barnet First magazine, social media, and other media may be used to better disseminate air quality information and spread awareness. There is the view to adopt a targeted approach to communicate with vulnerable residents within the borough. Airtext was considered, however the alerts found to often be different to the monitoring results from Barnet's automatic monitors at Tally Ho! Corner and Chalgrove School when poor air quality was detected.</p>
Green procurement policies Social Value Policy Sustainability Strategy	Borough fleet actions	11	<p>Barnet have regard to air quality / green procurement when preparing procurement requirements (as appropriate) with services. This is good practice procurement; we work with the procurement launch document to support development of requirement with service.</p> <p>This includes a review of social value delivery attainable through the procurement activity following L.B. Barnet's adoption of a Social Value Policy. The policy is aligned with Barnet's Corporate Plan 2021-25 and Barnet TOMs to assess delivery against improved air quality aspects.</p> <p>A difficulty is the number of contracted out services. Services contracted out some years ago will not have had environmental considerations built in, and there is less scope to add them or influence them halfway through.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
			<p>On the positive side, a requirement for contractors with fleet to be members of FORS is already considered and factored in as appropriate to contract requirement. HBPLaw have reviewed contracts for construction requirements to include FORS and CLOC. The Transport Service team are aware of the requirement to operate the most efficient vehicles the budget permits and to maintain these appropriately.</p>
<p>Maintain Bronze accreditation of the Fleet Operator Recognition Scheme (FORS) for the borough's</p>	<p>Borough fleet actions</p>	<p>12</p>	<p>Barnet Council have successfully renewed FORS membership for 2021-2022 and retained BRONZE status.</p>
<p>Investigate the possibility of increasing the number of hydrogen, electric, hybrid, bio-methane and other cleaner vehicles in the borough's fleet</p>	<p>Borough fleet actions</p>	<p>13</p>	<p>Barnet Council currently have 11 zero emission capable vehicles within our fleet, and a pool (hire) car fleet of 9 PHEV cars and 1 ICE van. As part of Barnet's wider Sustainability Strategy, there is a long-term commitment to transition to a fully decarbonised vehicle fleet by 2030, where possible.</p> <p>At the moment, there are issues stemming from the current world shortage of new vehicles. The shortages of some raw materials and no new vehicles are being made until 2022 or early 2023.</p> <p>Further information on Barnet's Sustainability Strategy Framework can be found at the following web address:</p> <p>https://www.barnet.gov.uk/sustainability-barnet/barnets-sustainability-strategy/sustainability-strategy-targets-and</p>
<p>Accelerate uptake of new Euro VI vehicles in borough fleet</p>	<p>Borough fleet actions</p>	<p>14</p>	<p>All Council vehicles now meet Euro VI specifications, except for 10 buses. This delay was caused by the issues with the global supply chain, which in turn affected the manufacturer. The 10 buses are scheduled to be replaced by May 2022</p>
<p>Safer Urban Driver training for drivers of vehicles in Borough's fleet; fuel-efficient driving and providing regular re-training of staff. This was introduced in 2012 with training from the Energy Savings Trust.</p>	<p>Borough fleet actions</p>	<p>15</p>	<p>As a result of COVID-19, booked courses were cancelled. These will be rescheduled once Transport for London funding is restored.</p>
<p>Control air pollution from</p>	<p>Localised Solutions</p>	<p>16</p>	<p>All inspections were completed for KPI - which met target 2021-2022. There were 59 Dry cleaning installations in 2021 and no cement batching processes.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
industrial / commercial and residential sources			
Monitor air quality	Monitoring and Other core statutory duties	17	<p>In 2021, we continued to monitor air quality (ambient NO₂ and PM₁₀ concentrations) at our two monitoring stations (Tally Ho & Chalgrove School) monthly. 15 diffusion tubes were exchanged and sent for analysis each month. Since February 2021, 3 further diffusion tubes were mounted at three locations along the A1000 to monitor NO₂ concentrations after the installation of the experimental cycle lane. This monitoring regime has been extended until September 2022. Developers continue to perform air quality monitoring at Brent Cross South and Cricklewood Rail Freight Facility.</p> <p>Barnet are also participating in the Breathe London Project; 4 locations within Barnet have Node monitors installed which measure PM_{2.5} and NO₂:</p> <ul style="list-style-type: none"> • Martin Primary School • Wessex Gardens Primary School • The Orion Primary School • Cat Hill Allotments <p>Measurement is typically centred around schools to obtain information on the levels of exposure to poor air quality of those using the facilities i.e., children, teachers etc. Results of monitoring can be obtained from the Breathe London webpage at: https://www.breathelondon.org/</p>
Explore the option of extending the Ultra-Low Emission Zone (currently proposed to stop at the A406) to cover whole of London Borough of Barnet	Cleaner Transport	18	The Ultra-Low Emission Zone (ULEZ) was expanded up to the A406 in October 2021. We will be monitoring the effects of the ULEZ on Air Quality in Barnet into 2022 and beyond.
Briefing members; Publicise ULEZ to residents; consider and plan for consequences of ULEZ.	Cleaner Transport	18.1	The council's communications team collaborated with TfL to support the communications campaign. There are now signs at strategic points/routes which let drivers know where the ULEZ boundary is. The Expansion of the ULEZ came into force in October 2021, and this action has been completed.
Lower the legal speed limit to 20mph in areas close to certain schools	Cleaner Transport	19	At end December 2021 there were approximately 57.7km of 20mph roads in Barnet; this is an increase of approx. 6.5km on the figure reported the previous year (to end Dec 2020).
Implementation of the Long-Term Transport Strategy	Cleaner Transport	19.1	The Long-Term Transport Strategy (2020 – 2041) was published in September 2020; the strategy can be found using the following link:

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
			https://www.barnet.gov.uk/sites/default/files/2021-10/Barnet%20LTTS%20v8.pdf
Improvement of electric vehicle charging point infrastructure	Cleaner Transport	20	<p>The Sustainability Strategy Framework outlines our commitment to installing a comprehensive network of charge points by 2030.</p> <p>In the financial year 2020-2021 we have installed 2x 6 dual charge point hubs (7kWh) at Watling Avenue and Lodge Lane Car Parks. We will be rolling out further lamp column charge points based on resident requests, and the borough's first rapid charge points. Furthermore, in 2021:</p> <ul style="list-style-type: none"> • 93 lamp column charge points were installed • £3.5m was secured to support the installation of up to 500 charge points by November 2022 <p>Implementation is now monitored through Barnet Plan reporting.</p>
Increase provision of cycle parking		21	<p>In the financial year 2021-22 TfL funding was not available for cycle parking, so no additional cycle parking was installed.</p>
Encourage modal shift to bicycle through improved bicycle routes and encourage a shift to walking by providing safer, more accessible and attractive pedestrian routes.	Cleaner Transport	22	<p>The experimental A1000 cycle lane was completed in November 2020. The scheme has seen the creation of 3.2km of cycle lanes, as semi segregated lanes or marked route within in 20mph, in the Finchley / Golders Green areas of Barnet borough, providing a safe and direct green corridor for commuters and leisure cyclists alike. The cycle lane provides a speedy connection between North Finchley Town Centre in the north and the boundary with Haringey borough in the south.</p> <p>First devised as part of the council's Long-Term Strategy Plan 2020-2041 for improving Barnet's transport network, the A1000 scheme has been constructed earlier than envisaged in the Plan, albeit as an experimental 'pop-up' design, to support Government emergency travel measures during the COVID-19 crisis. It is paid for by the Government's Emergency Active Travel Fund.</p> <p>Monitoring of the A1000 cycle lane is taking place at three locations: Commencing in February 2021; Diploma Court, High Road, N2 8NY (CL1) and Granville Place, High Road, N12 0AY (CL2); commencing in June 2021 at Martin Primary School, N2 9JP (CL3).</p> <p>As of December 2021, 10 months (February to November inclusive) of monitoring were completed at CL 1 and CL2, and 6 months (June to November inclusive) of were completed at CL3.</p> <p>The average NO2 concentrations at CL1 and CL2 over 10 months is 33.40 µg/m³ and 25.30 µg m⁻³ respectively.</p> <p>After 6 months of monitoring (June to November), the concentration at CL3 was 28.49 µg m⁻³.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;">Progress</p> <ul style="list-style-type: none"> • Emissions/Concentration data <ul style="list-style-type: none"> • Benefits • Negative impacts / Complaints
			<p>For comparison, the diffusion tube monitor PBN8 is also on the A1000, in a location which does not have a cycle lane:</p> <ul style="list-style-type: none"> • Over the same February to November period, the concentration of NO₂ at PBN8 was on average 38.64 µg m⁻³ • Over the June to November period, the concentration at PBN8 is 39.39 µg m⁻³.
Liaise with Transport for London to explore traffic control actions on TfL controlled roads	Cleaner Transport	23	We are continuing to investigate opportunities with TfL. Meetings have occurred in 2021, however no further progress has been made.
Liaise with the Highways Agency to explore options for improving air quality on the M1	Cleaner Transport	24	We are continuing to investigate opportunities with Highways England. Meetings have occurred in 2021, however no further progress has been made
Improvements in Air quality focus areas to Create Healthy Town Centres	Localised Solutions	25	<p>Improve public realm to create Healthy Streets in Finchley Central: new town square (c.3,000 sqm) in development, due to start on site Q2 2022-23. Low-emissions Local Delivery service trialled in Finchley to reduce pollution and congestion. Over 20 Temporary Streetspace Parklets installed in town centres across the borough to support businesses with social distancing and enhance local environments.</p> <p>More greening of Watling Avenue/A5 in Burnt Oak and improvements in public realm being planned to reduce congestion and improve pedestrianisation, this is a deprived area and will see ideas to encourage sustainable transport. Design team appointed to develop public realm approach in consultation with community in Burnt Oak.</p> <p>Regeneration scheme to integrate Hendon Central/ near A41, the Burroughs and the Middlesex University HUB which will minimise parking and further encourage sustainable transport.</p>

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in Barnet in 2021

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	<p>All major developments</p> <p><i>An air quality assessment is a requirement for all major developments over ten units. This incorporates operational air quality, air quality neutral, and construction impacts. The planning vetting team ensures that all air quality assessments submitted are checked by the scientific team. Smaller developments in areas of poor quality have a requirement for air pollution mitigation measures to be installed, but no assessment.</i></p>
Number of planning applications required to monitor for construction dust	<p><i>Barnet does this for the largest developments only, e.g., the Brent Cross Redevelopment project. We also typically request for dust monitoring should complaints be received.</i></p>
Number of CHPs/Biomass boilers refused on air quality grounds	<p>0</p> <p><i>No applications for CHP/biomass boilers were received in 2021</i></p>
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	<p>0</p> <p><i>No applications for CHP/biomass boilers were received in 2021</i></p>
Number of developments required to install Ultra-Low NO _x boilers	<p>All developments</p> <p><i>This is a standard Barnet requirement for all new homes, and so the number will be the number of new homes approved in the Borough. The Scientific Team were consulted on 898 planning applications</i></p>
Number of developments where an AQ Neutral building and/or transport assessments undertaken	<p>21</p> <p><i>The real number is greater; AQN assessments often come to us as part of the initial application. We currently only record instances where we have applied an AQN assessment condition.</i></p>

Condition	Number
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0 <i>Most assessments conclude that the development is air quality neutral. It is usually the transport assessment that does not meet the benchmark rather than the buildings one. It can be a challenging process to negotiate further measures to offset emissions. Defining measures is often not done in a scientific or robust way.</i>
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 and Canary Wharf</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</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 IIIB of the Directive and/or exemptions to the policy.</p>	<p>LB Barnet has a standard condition for NRMM to be compliant and registered on the NRMM website.</p> <p>21 registered and compliant; 14 self-compliant (64 %), 7 compliant after engagement (32 %)</p> <p>1 (4 %) site uncompliant and subsequently engaged.</p>
<p>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>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.</p>	<p>6 had no NRMM within scope presently deployed.</p> <p>14 Sites completed</p>

Some planning data as required in **Table K** is not collected or not collected in a form that is easily translatable into the table. At Barnet Council, the scientific team periodically define the parameters for which planning applications should be consulted on by us. Planning applications are vetted and sent to Scientific Services when certain parameters are met, and then assigned to team members using the Uniform/ldox system. KPIs are set to ensure the consultation response is made in good time. The planning officers and the scientific team maintain a good relationship for effective collaboration; submissions to discharge planning conditions are also reviewed by the Scientific team. Enforcement of conditions are applied to provide a basis to tackle complaints. There is no system to proactively ensure that air quality requirements and other conditions are complied with.

For example, when there have been complaints of dust from construction sites, we have been able to use the threat of taking action for non-compliance with our Construction Method Statement condition. Through this we can also persuade companies/contractors to comply with the NRMM requirements by referring to it.

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 Barnet Fleet

All Local Authority HGVs are currently Euro VI standard.

Barnet's Fleet is approximately 337 vehicle units; in the 'zero emission' category we currently have:

- 8 electric Vacuum cleaners for street use
- 1 Supervisors Van
- 1 Electric Car
- 1 Hybrid car

This currently represents 3.3% of the fleet, however this number is set to rise with the implementation of the Barnet Sustainability Strategy, which commits to conversion to a 100% electric fleet by 2030 if practicable.

In addition to the above, Barnet also has a pool car fleet of 10 hybrid vehicles (9 cars and 1 van).

4.2 NRMM Enforcement Project

Barnet can confirm that the borough is continuing to support the NRMM Enforcement project in 2022 – 23.

4.2 Air Quality Alerts

Air text was not deemed to be suitable for use in Barnet, as alerts typically did not reflect the monitoring in Barnet at the automatic monitoring stations as Chalgrove School and Tally Ho! Corner.

Barnet communications team is providing live/direct alerts about air quality conditions within the borough on the main website which is linked directly to the Ricardo AEA (Air Quality England) website. Further/planned actions also include the dissemination of data and information through GP surgeries, and collaboration with neighbouring London boroughs in providing a suite of advice to residents to improve air quality.

Appendix A Details of Monitoring Site Quality QA/QC

A.1 Automatic Monitoring Sites

ABN1 (Tally Ho) and ABN2 (Chalgrove School) are routinely calibrated, serviced and audited to ensure data is as accurate as possible. In 2021, the site audits and data management were carried out by Ricardo Energy and Environment to national standards and operational procedures defined by AURN. Site audits were carried out in May and November 2021 and post audit the site data was then ratified.

Routine calibrations took place monthly for ABN1 and ABN2 by Barnet Scientific Officers. Servicing and maintenance are carried out bi-annually by an external contractor. The contractor for both sites was Matts Monitors and bi-annual servicing followed the audits by Ricardo Energy and Environment.

PM₁₀ Monitoring Adjustment

No adjustments made to Particulate Matter monitoring data which is done by the TEOM method.

The Volatile Correction Model (VCM) is applied to the PM₁₀ data from TEOM analyser at Tally Ho Corner and Chalgrove School. VCM allows you to correct TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. The resulting corrected measurements have been demonstrated as equivalent to the gravimetric reference equivalent. The VCM works by using the volatile particulate matter measurements provided by nearby FDMS instruments (within 130 km) to assess the loss of PM₁₀ from the TEOM; this value is then added back onto the TEOM measurements. This correction is automatically applied to our data and displayed at airqualityengland.co.uk.

A.2 Diffusion Tubes

The diffusion tubes for NO₂ used in all London Borough of Barnet sampling are supplied and analysed by Gradko International Ltd (UKAS 2187) and conform to BS EN 13528 Parts 1-3: 2002/3.

All the tubes used are prepared using 50% TEA/Acetone and analysed using the UKAS accredited in house method (GLM 9), by continuous flow colorimetric analyser.

Gradko participates in the AIR proficiency-testing (AIR PT) NO₂ diffusion tube scheme which uses artificially spiked diffusion tubes to test each participating laboratory's analytical performance on a quarterly basis. The scheme is designed to help laboratories meet the European Standard. Gradko's AIR PT result for January-March 2021 was 25 %. Gradko's analytical precision for diffusion tubes is rated "G – Good", for all 14 studies used to derive the 2021 bias adjustment factor for the 50% TEA in Acetone method. Previously to the Air-PT scheme, Gradko participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO₂ diffusion tube analysis.

Diffusion Tube Storage:

When collected, exposed diffusion tube samples were sent to Gradko laboratory immediately after collection, for analysis.

Annualisation of Diffusion Tube Data:

We typically annualise our data in line with the current methodology as outlined within Box 4.3 of LLAQM.TG (19)2 for London boroughs. This can be completed through application of the new Diffusion Tube Data Processing Tool. The new Diffusion Tube Data Processing Tool was used to process all diffusion tube data.

The tool is available here: <https://laqm.defra.gov.uk/tools-monitoring-data/dtdp.html>

The tool has been developed to calculate annual mean concentrations more easily for the diffusion tube monthly data, by amalgamating the following individual LAQM processing tools:

- Annualisation tool
- Precision and accuracy tool – calculation of local bias; and
- NO₂ fall off with distance calculator.

The tool produces outputs will be uploaded to the LAQM Portal via the Diffusion Tube Data Entry System (DTDES) upload facility. This is a new mandatory requirement to submit NO₂ diffusion tube data. The LAQM Portal has been developed to incorporate the previous Report Submission Website (RSW) and the Diffusion Tube Data Entry System (DTDES). This is to provide local authorities with a single access point to submit all relevant information regarding LAQM. Annualisation was not required for diffusion tube data in 2021.

Bias Adjustment Factor:

Using the most recent national bias adjustment data (Version 03/22), a bias adjustment factor of 0.83 has been applied to all the diffusion tubes in the 2021 calendar year. For comparison, in 2020 a national bias adjustment factor of 0.82 was used. The relevant examples were selected using the spreadsheet workflow by using the same laboratory, and preparation method. A local bias adjustment was not used as there is only one tube co-located. Details are shown in Table L. The bias adjustment factor obtained from the LAQM Support Website at <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Table L. Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	03/22	0.83
2020	National	03/21	0.82
2019	National	03/20	0.87
2018	National	03/19	0.92
2017	National	03/18	0.97
2016	National	03/17	1.03
2015	National	03/16	0.98

National Diffusion Tube Bias Adjustment Factor Spreadsheet			Spreadsheet Version Number: 03/22							
<p>Follow the steps below in the correct order to show the results of relevant co-location studies</p> <p>Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods</p> <p>Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet</p> <p>This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.</p>								<p>This spreadsheet will be updated at the end of June 2022</p> <p>LAQM Helpdesk Website</p>		
<p>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.</p>					<p>Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.</p>					
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		<p>Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution.</p> <p>Where there is more than one study, use the overall factor³ shown in blue at the foot of the final column.</p>				
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data.		<p>If you have your own co-location study then see footnote³. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953</p>				
Analysed By ¹	Method	Year	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 ²	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	50% TEA in acetone	2021	R	London Borough of Richmond upon Thames	12	24	21	15.1%	G	0.87
Gradko	50% TEA in acetone	2021	B	London Borough of Richmond upon Thames	9	16	13	21.5%	G	0.82
Gradko	50% TEA in acetone	2021	KS	Marylebone Road Intercomparison	10	52	41	24.2%	G	0.81
Gradko	50% TEA in acetone	2021	R	Reading Borough Council	12	30	26	15.3%	G	0.86
Gradko	50% TEA in acetone	2021	R	Merton Council	9	50	32	55.4%	G	0.64
Gradko	50% TEA in acetone	2021	UB	Wandsworth Council	11	29	26	9.8%	G	0.91
Gradko	50% TEA in acetone	2021	Overall Factor³ (14 studies)						Use	0.83

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

No annualisation has been performed on monitoring data for 2021.

Distance Adjustment

The following monitoring site nearly recorded an exceedance but was not representative of public exposure (PBN6/355 Hendon Way), therefore the procedure specified in LLAQM.TG (19) has been used to estimate the concentration at the nearest receptor. The process is described below. The distance correction was made, using the NO₂ “Fall-Off-With-Distance-Calculator”.

PBN6/355 Hendon Way (8 m from relevant exposure; measurement made 1 m from kerb; 24.4 µg^m⁻³ local background annual mean) was adjusted from 44.5 µg^m⁻³ to 35.6 µg^m⁻³. Refer to **Table N**.

Table N. NO₂ Fall off With Distance Calculations

Diffusion Tube ID	Distance (m)		NO ₂ Annual Mean Concentration (µg/m ³)		
	Monitoring Site to Kerb	Receptor to Kerb	Bias Adjusted	Background	Predicted at Receptor
PBN6	1.0	9.0	44.5	24.4	35.6

Appendix B Full Monthly Diffusion Tube Results for 2021

Table O. NO₂ Diffusion Tube Results

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
PBN1	90.1	90.1	33.7	39.6	27.3	33.2	26.0	21.4	23.2	18.5	29.2	31.6	28.1		28.3	23.5
PBN2	100.0	100.0	40.2	39.4	36.0	36.3	32.2	34.1	30.9	28.0	36.0	40.2	40.4	34.4	35.7	29.6
PBN3	90.9	90.9	-	16.9	15.6	14.1	12.6	12.0	11.7	10.3	17.0	18.9	20.9	19.9	15.5	12.8
PBN5	100.0	100.0	30.2	27.9	23.1	23.3	17.9	16.5	19.4	13.7	21.9	26.3	28.1	25.0	22.8	18.9
PBN6	92.8	92.8	57.5	53.6	50.9	53.5	56.2	47.1	50.5	-	56.7	59.4	56.2	48.4	53.6	44.5
PBN8	100.0	100.0	41.8	42.5	36.9	33.2	37.5	35.8	36.0	32.3	39.1	48.6	44.6	44.8	39.4	32.7
PBN9	100.0	100.0	43.2	46.3	44.0	46.8	43.9	37.6	46.5	39.0	42.8	47.0	51.4	40.2	44.0	36.6
PBN10	100.0	100.0	34.7	40.6	41.1	38.5	38.7	37.9	35.4	30.8	41.7	49.8	48.7	36.1	39.5	32.8
PBN12	92.6	92.6	43.3	-	37.7	32.3	37.9	34.8	28.3	28.4	37.6	47.0	45.8	39.6	37.5	31.1
PBN13	100.0	100.0	28.3	27.3	22.6	19.6	21.4	19.7	17.0	18.1	21.7	30.3	27.8	26.3	23.3	19.4

Site ID	Valid data capture for monitoring period % ^(a)	Valid data capture 2021 % ^(b)	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
PBN14	91.7	91.7	52.2	58.6	-	48.5	46.4	43.3	52.4	40.1	51.4	55.8	47.6	40.2	48.8	40.5
PBN17	100.0	100.0	47.4	51.1	41.1	36.5	39.9	32.7	37.7	31.5	38.0	47.6	46.1	38.8	40.7	33.8
PBN18	90.1	90.1	44.3	44.2	46.3	36.5	46.6	37.1	36.5	39.2	-	48.7	53.6	45.7	43.5	36.1
PBN19	100.0	100.0	50.2	49.8	40.6	46.1	42.5	34.5	40.8	33.5	41.8	44.5	43.1	34.7	41.8	34.7
PBN20	100.0	100.0	37.6	34.2	30.9	33.9	32.8	31.1	29.4	28.2	47.0	46.0	40.1	36.7	35.7	29.6

Notes

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

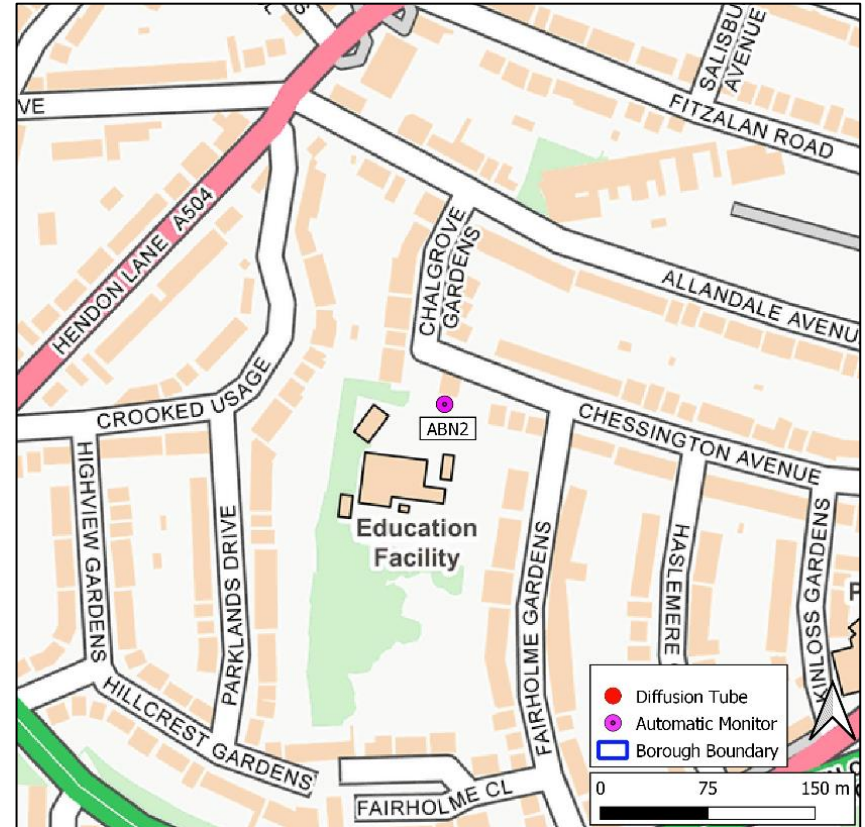
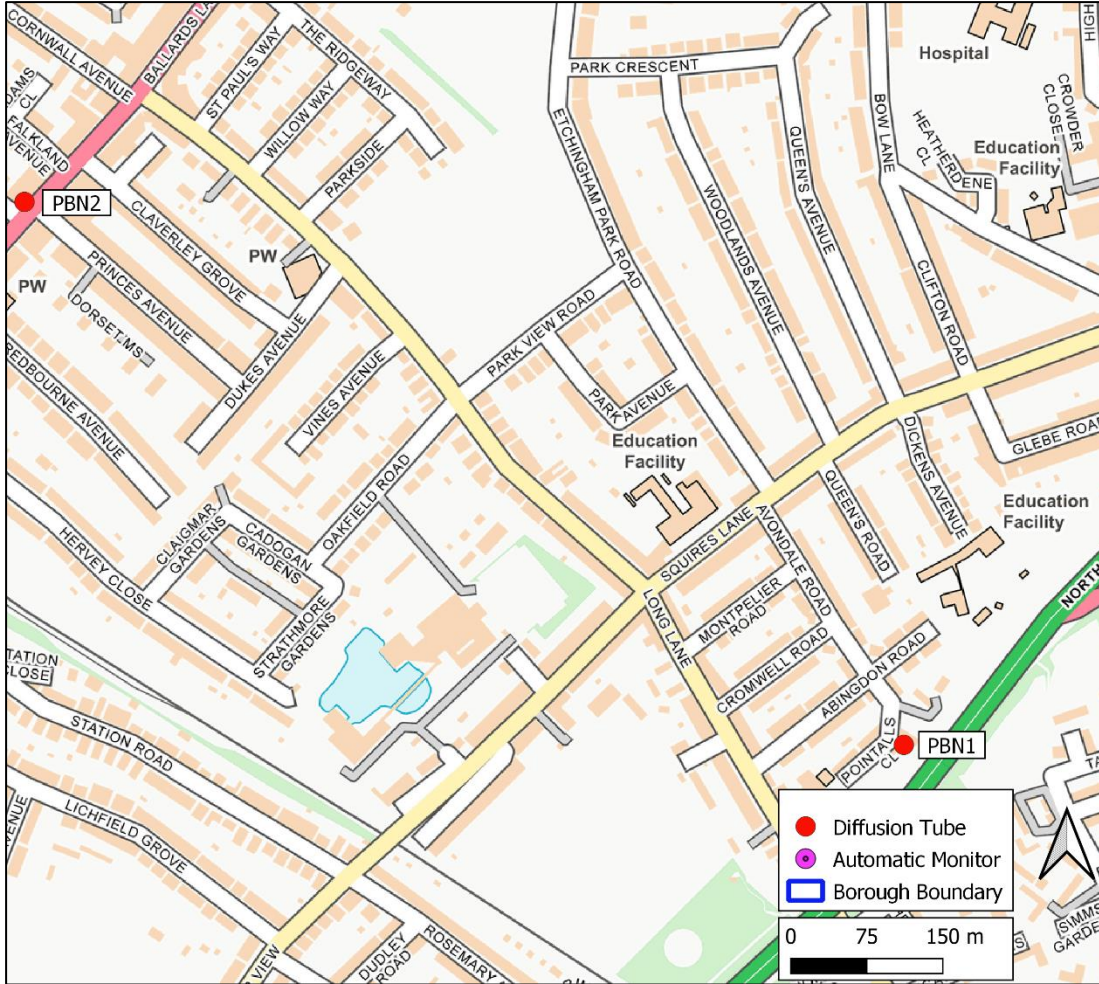
Exceedances of the NO₂ annual mean AQO of 40 $\mu\text{g m}^{-3}$ are shown in **bold**.

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**.

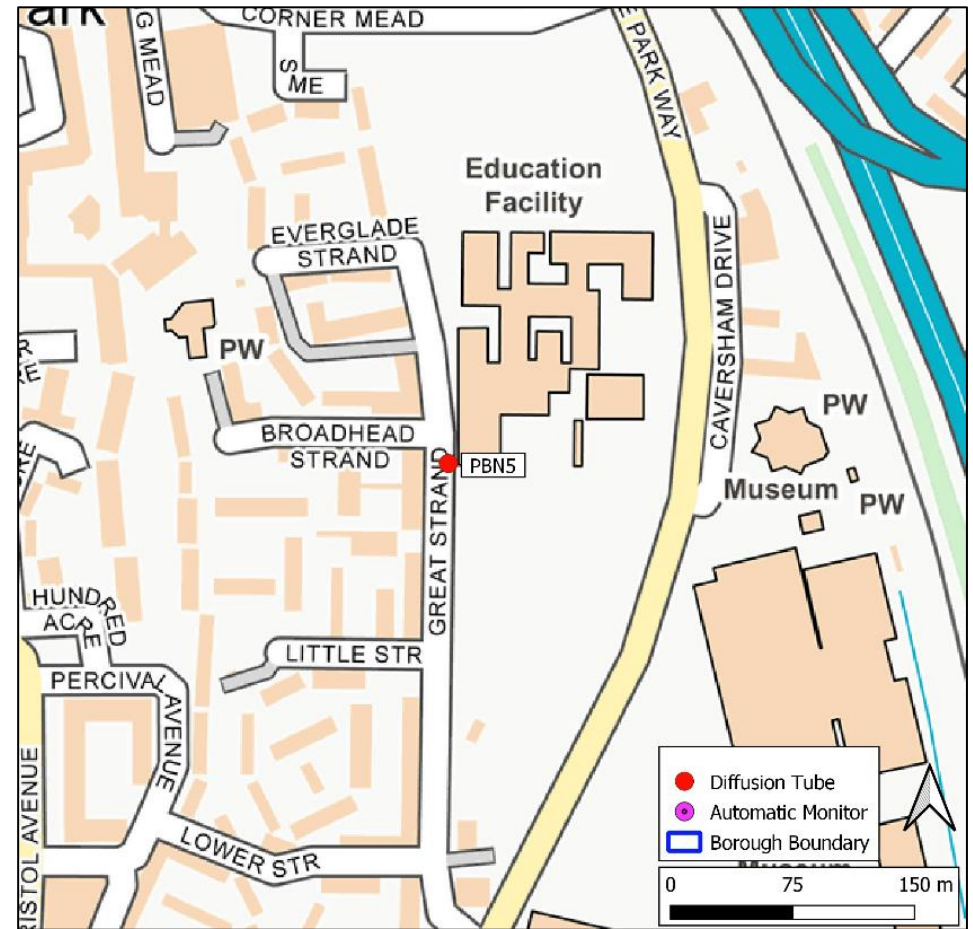
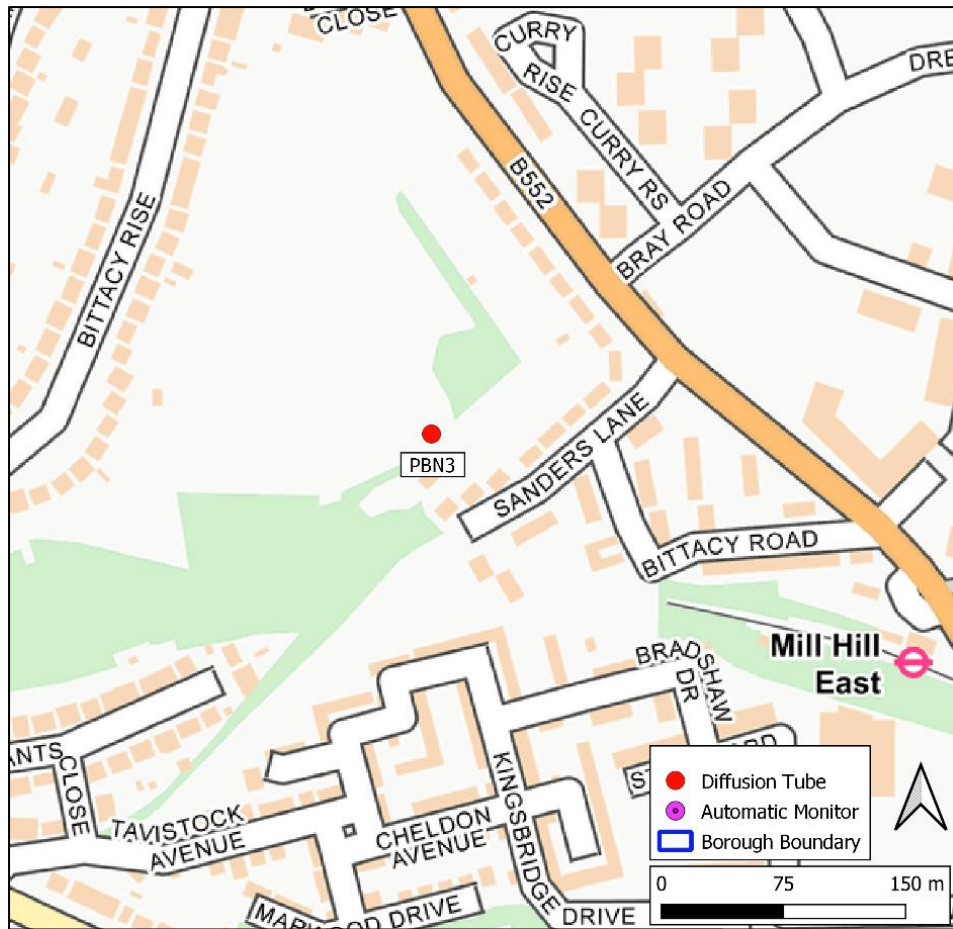
All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 25%.

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

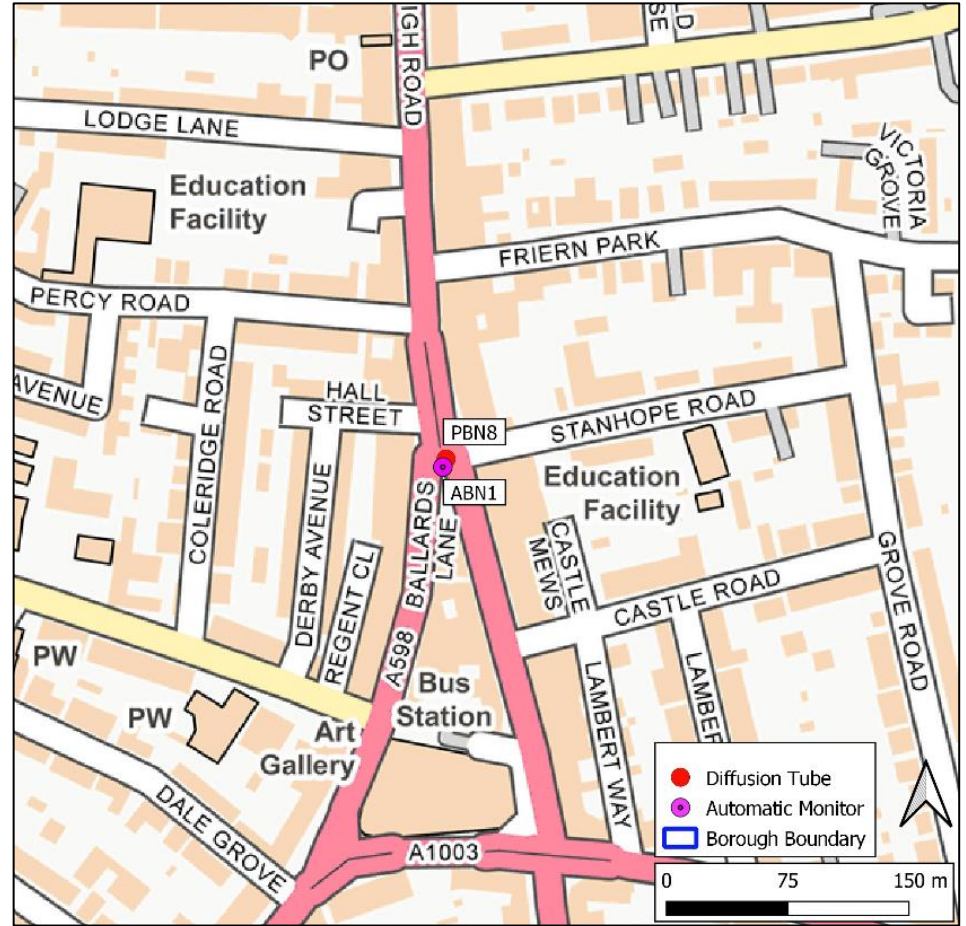
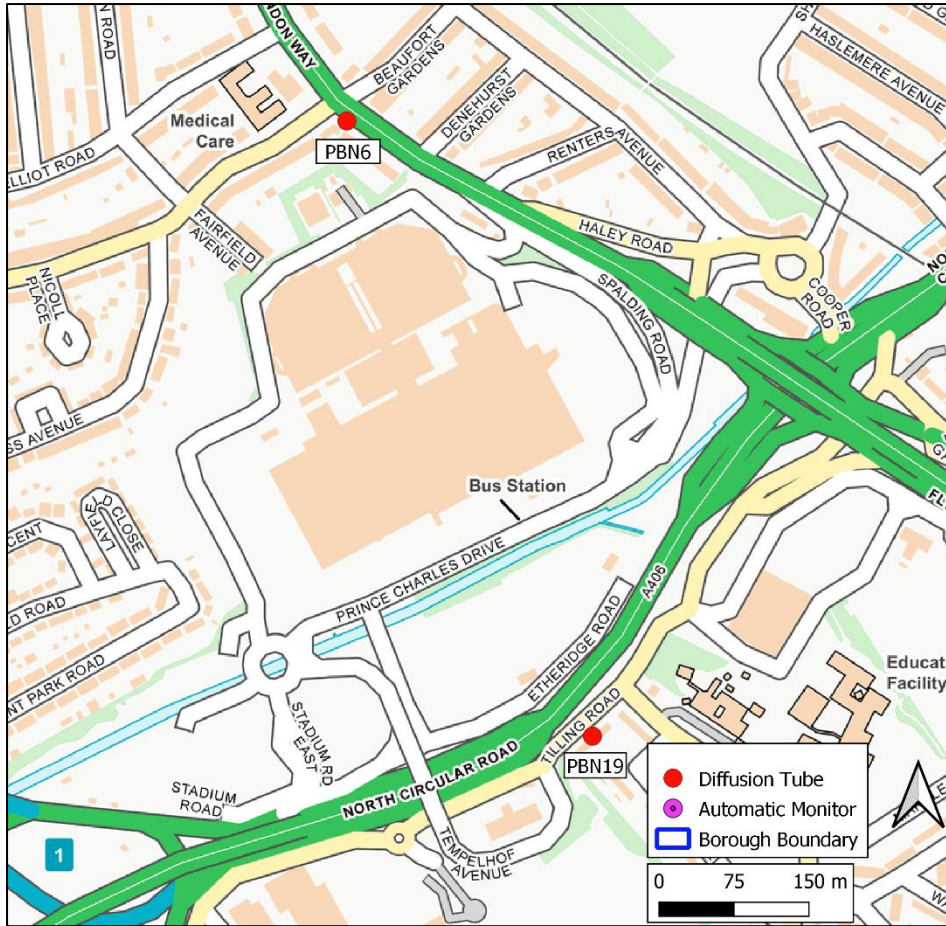
(b) data capture for the full calendar year (e.g., if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).



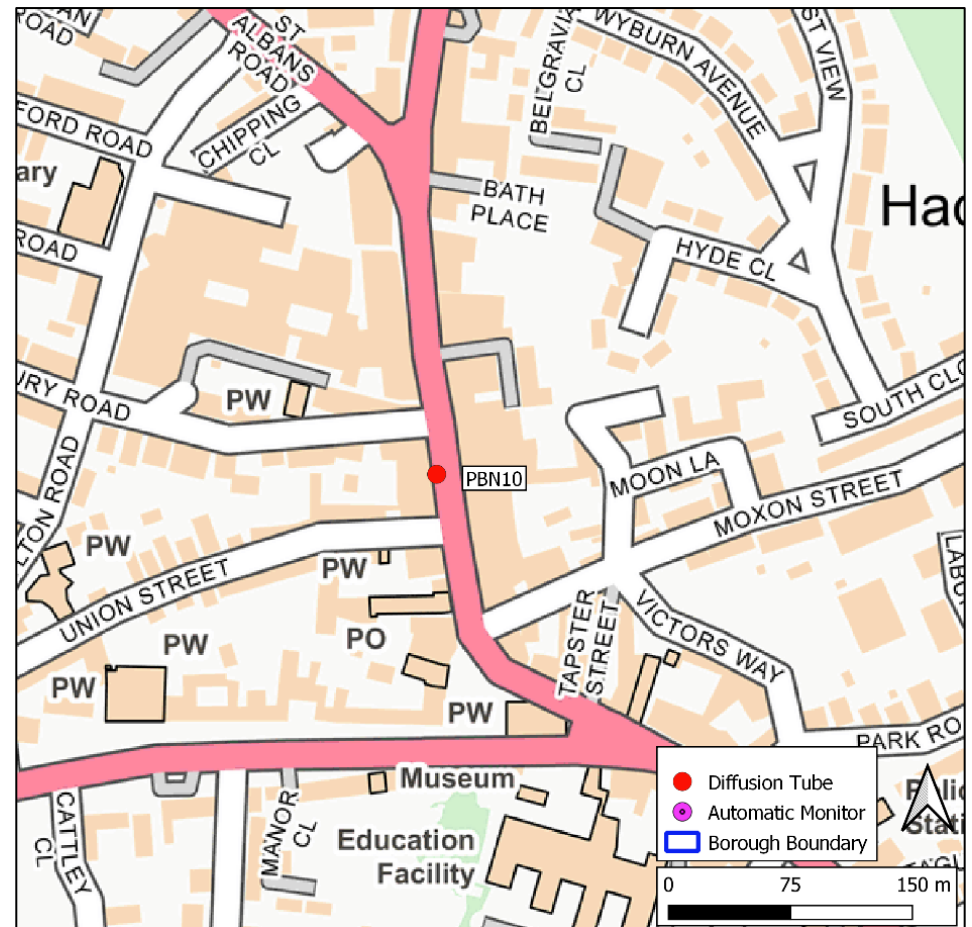
Pointalls Close, Ballards Lane, and Chalgrove School



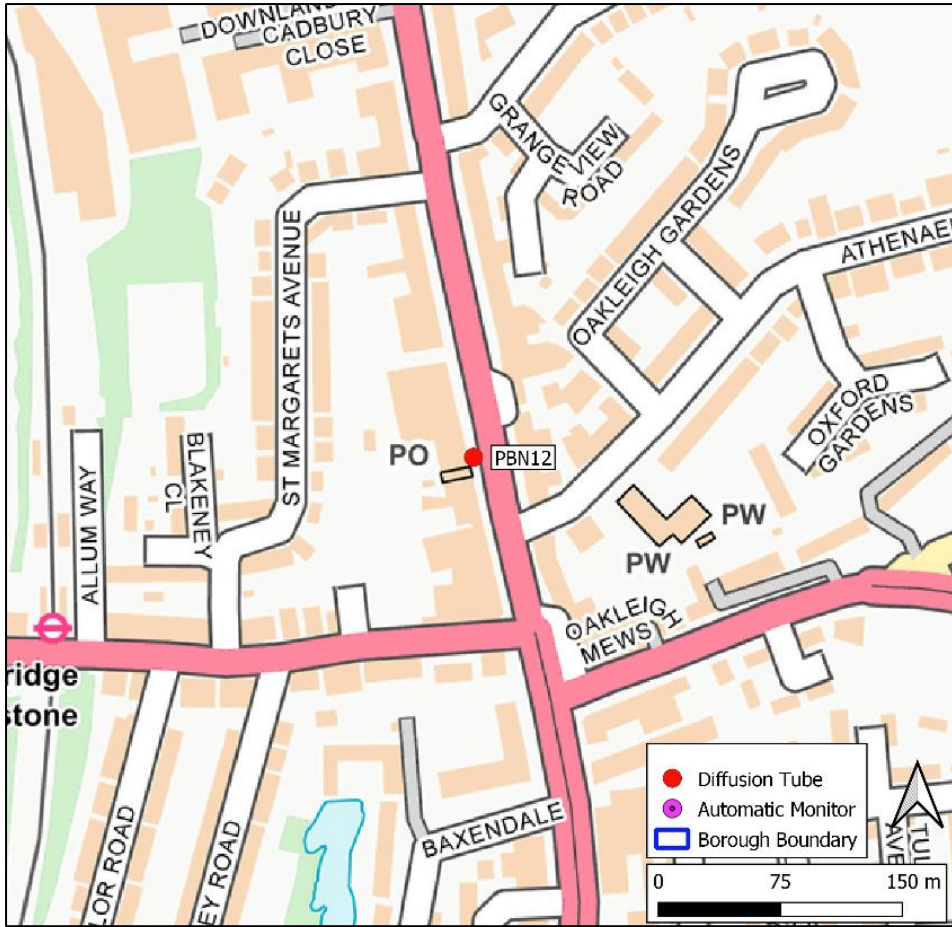
Sanders Lane Allotments and St James Catholic School



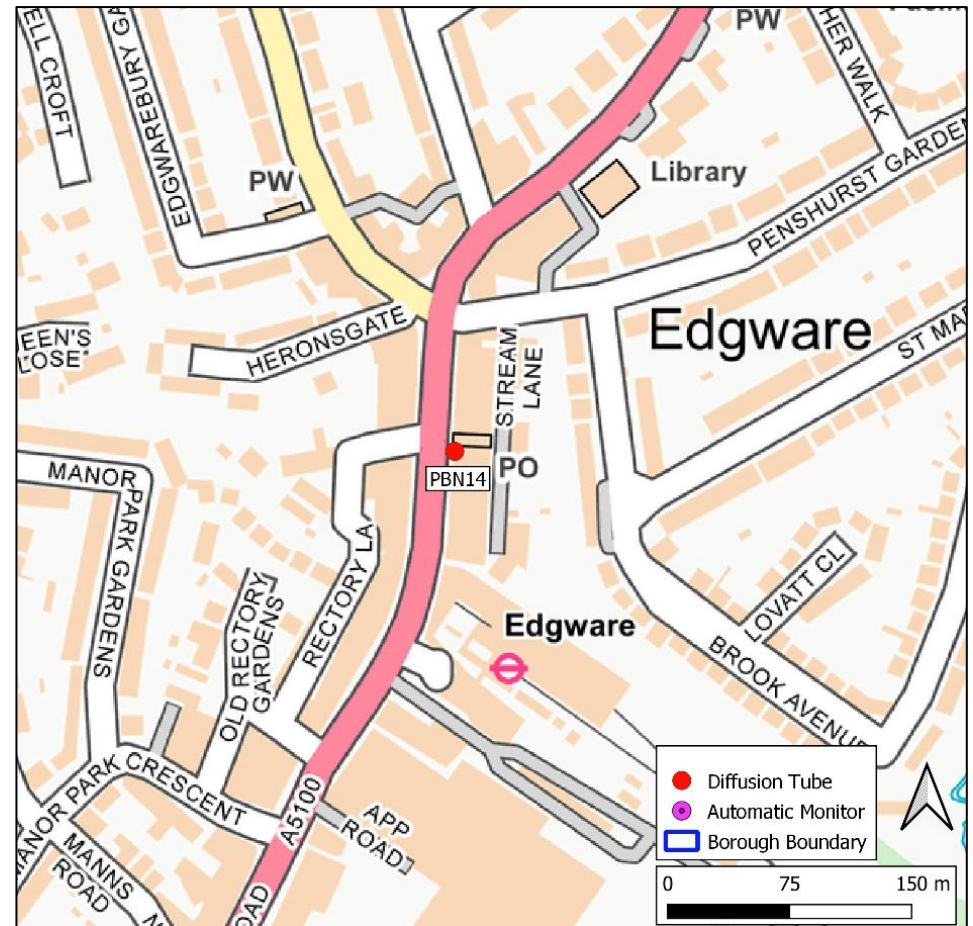
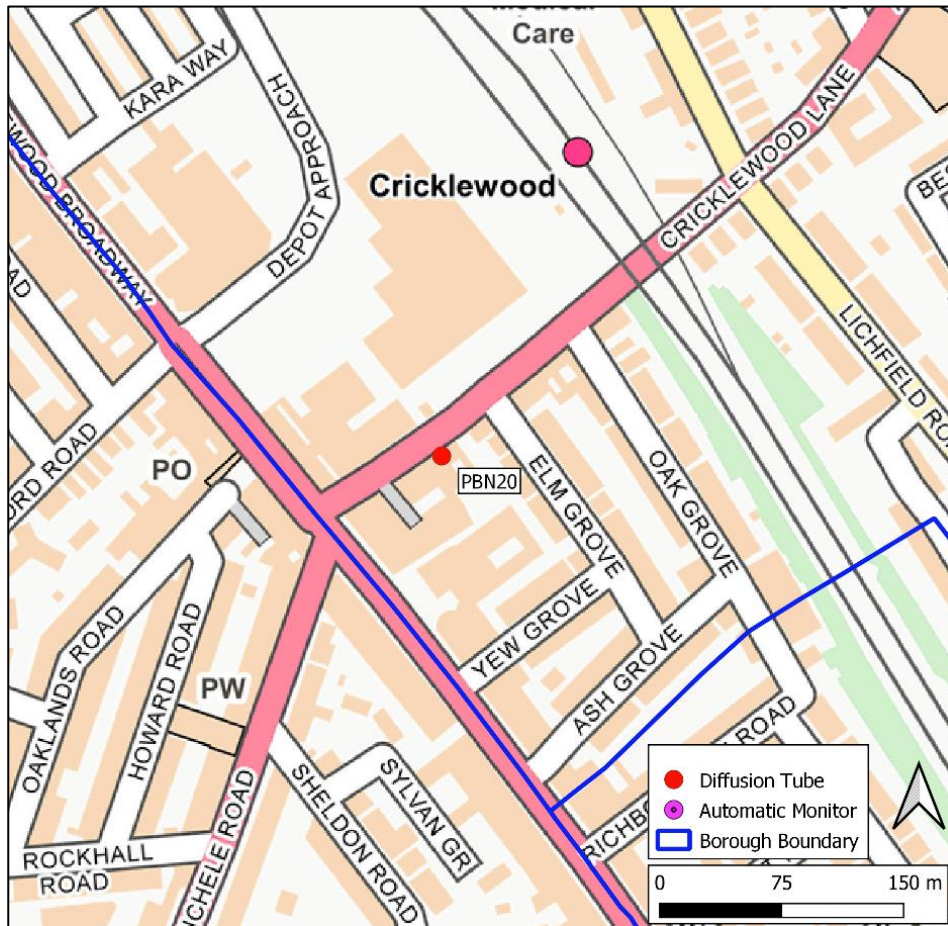
355 Hendon Way, behind 7-12 Dyson Court, and Tally Ho



52 Golders Green Road, Back of Golders Green Bus Station, Golders Green National Express stop, and High Street, High Barnet



1295 High Road Whetstone, and Courtland Avenue



Flats above 16 Cricklewood Lane, Station Road Edgware.