London City Airport Air Quality Monitoring Strategy:

Quarterly Report
January to March 2018

May 2018

Experts in air quality management & assessment

Document Control

Client	London City Airport	**Principal Contact**	Tessa Simpson

Job Number	J3140

Report Prepared By:	Dr Aidan Farrow and Dr Joshua Nunn

Document Status and Review Schedule

Report No.	Date	Status	Reviewed by
J3140/1/F1	10th May 2018	Final Report	Stephen Moorcroft

Air Quality Consultants Ltd
23 Coldharbour Road, Bristol BS6 7JT Tel: 0117 974 1086
12 Airedale Road, London SW12 8SF Tel: 0208 673 4313
aqc@aqconsultants.co.uk

Registered Office: 12 St Oswalds Road, Bristol, BS6 7HT
Companies House Registration No: 2814570

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Executive Summary

This document represents the January to March 2018 Quarterly Report for the Air Quality Monitoring Strategy (AQMS) that is operated on behalf of London City Airport. This programme measures concentrations of nitrogen dioxide (NO_2) and fine particles (the so called PM_{10} fraction, i.e. particles that are less than 10 micrometres in diameter).

Monitoring is carried out at two automatic monitoring stations. One is situated on the roof of City Aviation House (LCA-CAH), whilst the other is to the north of Royal Albert Dock, adjacent to the Newham Dockside building (LCA-ND). These automatic sites are supplemented by a network of passive monitoring devices (nitrogen dioxide diffusion tubes) located at a further 16 sites in and around the Airport boundary.

The Government has set a number of air quality objectives to protect human health. These are based on monitoring carried out over the period of a calendar year. It is thus not possible to directly compare the concentrations measured over the period January to March 2018 with the objectives.

In some cases, these objectives refer to average concentrations of pollutants measured over the calendar year (the "annual mean"); in other cases they refer to the number of hours or days on which a specified pollutant concentration should not be exceeded (for example, no more than 35 days in each calendar year on which PM_{10} concentrations exceed 50 µg/m^3, and no more than 18 hours in each calendar year on which nitrogen dioxide concentrations exceed 200 µg/m^3).

In addition to the objectives, the Government has established a set of descriptors for the 1-hour mean concentrations of nitrogen dioxide and 24-hour mean concentrations of PM_{10}. Air quality is defined by these descriptors as being 'Low', 'Moderate', 'High' or 'Very High'.

Pollution concentrations measured in and around the Airport are associated with a wide range of sources at the local, regional, national and international scales. On occasions when pollution levels rise, these higher levels are often observed across the whole of London as a "regional pollution episode". To assist with the interpretation of the results, pollution levels measured at other London monitoring sites are included in this report.

Nitrogen Dioxide

The period mean nitrogen dioxide concentration measured at the automatic station on the roof of City Aviation House was 34.1 µg/m^3 (microgrammes per cubic metre); a lower concentration (29.9 µg/m^3) was measured at the Newham Dockside site. The period mean concentrations at the City Aviation House and at Newham Dockside sites were both below the objective value (as set out above, the measured concentration over three months cannot be directly compared with the objective which relates to a calendar year). There were no recorded exceedances of the 1-hour mean objective value at either site. All hourly concentrations were classified as being within the 'Low' pollution band.

Concentrations of nitrogen dioxide at background sites, and at one roadside site, elsewhere in London over this period ranged from 21 to 47 µg/m^3, with similar patterns in levels as seen at the two London City Airport sites. There was a good correlation between observed peaks at the Airport sites and other London sites, suggesting that these occurrences were due to regional sources and changing weather conditions that affect the dispersion and dilution of pollutant emissions.

The period mean nitrogen dioxide concentrations measured at the diffusion tube sites ranged from 26 to 41 µg/m^3. At all but one of the 16 diffusion tube monitoring sites, measured concentrations were below the annual mean objective value of 40 µg/m^3 (however, as set out above, the measured concentration over three months cannot be directly compared with the objective, which relates to a calendar year).

Fine Particles (PM_{10})

The period mean PM_{10} concentration measured at the automatic station on the roof of City Aviation House was 20.0 µg/m^3 (microgrammes per cubic metre). This is well below the objective value of 40 µg/m^3 (however, as set out above, the measured concentration over three months cannot be directly compared with the objective, which relates to a calendar year). There was a single recorded exceedance of the 24-hour mean objective (compared with the 35 exceedances allowed in a calendar year). The majority (98.8%) of the running 24-hour mean concentrations were classified as 'Low', whilst running 24-hour mean concentrations were classified as 'Moderate' for the remaining 1.2% of the time. There were no running 24-hour mean concentrations within the 'High' or 'Very High' pollution bands.

Concentrations of PM_{10} at background sites elsewhere in London over this period showed similar patterns as seen at the Airport site. In particular, there was a good correlation between observed peaks at the Airport site and other London sites, suggesting that these occurrences were principally due to regional sources and changing weather conditions that affect the dispersion and dilution of pollutant emissions.

1 Introduction

1.1 This document represents the January to March 2018 Quarterly Report for the Air Quality Monitoring Strategy (AQMS), operated on behalf of London City Airport (LCA).

1.2 The City Airport Development Programme (CADP) 1 planning application was granted planning permission by the Secretaries of State for Communities and Local Government and Transport in July 2016 following an appeal and public inquiry which was held in March / April 2016. Condition 57 of the CADP 1 planning permission requires that an Air Quality Monitoring Strategy be implemented on commencement of the development.

1.3 The AQMS, as defined within Condition 57, requires the operation of two automatic air quality monitoring stations, situated on the roof of City Aviation House and at Newham Dockside, and a network of nitrogen dioxide diffusion tubes, situated in and around the Airport site.

1.4 The AQMS is managed by Air Quality Consultants Ltd. (AQC) on behalf of London City Airport. Service support for the automatic monitoring stations is provided by Enviro Technology Services plc, with Ricardo Energy & Environment providing independent audit checks.

1.5 Chapter 2 of this Report sets out the various standards and guidelines against which air pollution concentrations should be compared. Chapter 3 describes the monitoring methodology and provides a summary of the measured concentrations in the January to March 2018 period with respect to these criteria, and compares the measured concentrations with other local monitoring sites.

2 Assessment Criteria

2.1 The Government has established a set of air quality standards and objectives to protect human health. The 'standards' are set as concentrations below which effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of an individual pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of economic efficiency, practicability, technical feasibility and timescale. The objectives for use by local authorities are prescribed within the Air Quality Regulations, 2000, Statutory Instrument 928 (2000) and the Air Quality (England) (Amendment) Regulations 2002, Statutory Instrument 3043 (2002). The objectives for nitrogen dioxide were to have been achieved by 2005, and continue to apply in all future years thereafter. The relevant objectives for this report are provided in Table 1.

2.2 The European Union has also set limit values for nitrogen dioxide and PM_{10}. Achievement of these values is a national obligation rather than a local one (Directive 2008/50/EC of the European Parliament and of the Council, 2008), and compliance can only be determined by the national monitoing network operated by Defra. The limit values are numerically the same as the UK objectives; the nitrogen dioxide limit values were to have been achieved by 2010 (The Air Quality Standards Regulations 2010 (No. 1001), 2010) and the PM_{10} limit values were to be achieved by 2005.

Table 1: Relevant Air Quality Objectives

Pollutant	Time Period	Objective / Value
Nitrogen Dioxide	1-hour mean	200 μg/m^3 not to be exceeded more than 18 times a year
	Annual mean	40 μg/m^3
Fine Particles (PM_{10}) [a]	24-hour mean	50 μg/m^3 not to be exceeded more than 35 times a year [b]
	Annual mean	40 μg/m^3

[a] Measured by the gravimetric method.

[b] Equivalent to a 90th percentile of 24-hour mean concentrations of 50 μg/m^3.

2.3 In addition to the objectives, Defra has established a set of descriptors for the 1-hour mean values for nitrogen dioxide, classifying the concentrations in an index from 1 to 10 and thus labelling the levels as 'Low', 'Moderate', 'High' or 'Very High' (Defra, 2013). The banding is referred to as the Daily Air Quality Index (DAQI). The DAQI criteria are set out in Table 2.

Table 2: Daily Air Quality Index Bandings

Band	Index	Nitrogen Dioxide 1-hour Mean (µg/m^3)	PM_{10} 24-hour mean (µg/m^3) [a]
Very High	**10**	601 or more	101 or more
High	**9**	535 – 600	92 – 100
	8	468 – 534	84 – 91
	7	401 – 467	76 – 83
Moderate	**6**	335 – 400	67 – 75
	5	268 – 334	59 – 66
	4	201– 267	51 – 58
Low	**3**	135 – 200	34 – 50
	2	68 – 134	17 – 33
	1	0 – 67	0 – 16

[a] Reference equivalent. 24-hour values are 00:00 to 23:59.

3 Monitoring Methodology and Results

Automatic Monitoring Stations

3.1 Monitoring was carried out at two automatic stations as follows:

- City Aviation House (LCA-CAH): Nitrogen dioxide and PM_{10}.
- Newham Dockside (LCA-ND): Nitrogen dioxide.

The locations of the two automatic sites are shown in Figure 1.

3.2 The LCA-CAH automatic monitoring station measures PM_{10} using a Rupprecht and Patashnick TEOM 1400 Particulate Monitor, whilst both automatic stations measure nitrogen dioxide using M200E TAPI chemiluminescence analysers. The data are stored as 15-minute mean concentrations. Before further processing and ratification the raw PM_{10} concentrations have been adjusted to a "reference-equivalent" using the Volatile Correction Model (VCM) as recommended by Defra (2016). This adjusts the TEOM data using the "purge" concentration measured by an FDMS analyser, assuming this represents the volatile component that has been lost. A "VCM web portal" has been established that allows this correction to be derived from the mean of up to three, nearby FDMS analysers in the national network.

3.3 Independent site audits, conducted by Ricardo-E&E, confirmed that both automatic monitoring stations were operating above the minimum standards set for the national networks operated by Government. The last audit was carried out on 27th February 2018.

3.4 Ratification of the data has been based on calibration factors determined from the calibration reports, along with visual examination of the data and comparison with monitoring data from nearby national network background sites (Bexley, Bloomsbury and Eltham) (Defra, 2018). Any erroneous data have been flagged and removed from subsequent analysis. 1-hour, 24-hour, and period means have then been calculated.

3.5 Pollution concentrations measured at both automatic Airport monitoring stations are associated with a wide range of sources at the local, regional, national and international scales. On occasions when pollution levels rise, these higher levels are often observed across the whole of London as a "regional pollution episode". To assist with the interpretation of the results, comparable data have been obtained from the national Air Quality Archive (Defra, 2018) for three background sites, Bexley, Bloomsbury and Eltham, and from the London Air Quality Network (KCL, 2018) for two sites within the London Borough of Newham at Wren Close, Canning Town (background) and Cam Road, Stratford (roadside).

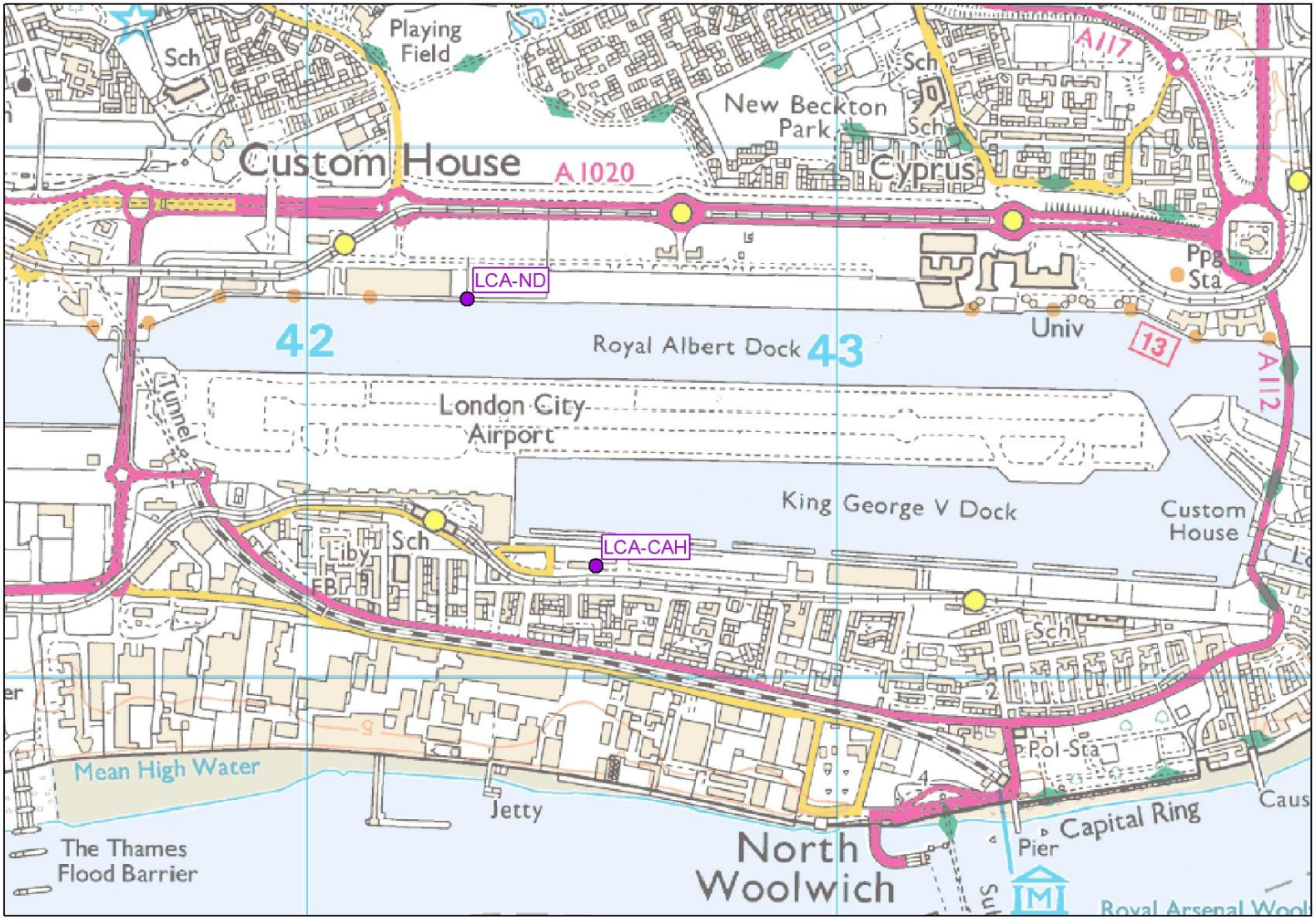

Figure 1: Automatic Monitoring Locations (purple dots).

Nitrogen Dioxide

3.6 The nitrogen dioxide results for the period January to March 2018 for the LCA-CAH and LCA-ND automatic monitoring stations are summarised in Table 3. The 1-hour mean data are also shown plotted in Figure 2. Data capture was high at both LCA-ND and LCA-CAH (above 90% at each site[1]). It is not possible to compare the measured concentrations with the objectives, as these only apply to a period of a calendar year (a comparison with the objectives over the full 2018 calendar year will be provided in the Annual Report for 2018); however, the measured concentrations for the three month period at both sites were below the annual mean objective value of 40 µg/m^3. The 1-hour mean objective value was not exceeded at either LCA-CAH or LCA-ND, i.e. there were no measured exceedances of 200 µg/m^3 compared with the 18 exceedances allowed in a calendar year.

Table 3: Nitrogen Dioxide (NO_2) Data Summary for LCA-CAH and LCA-ND, January to March 2018 [a]

Pollutant	LCA-CAH	LCA-ND	Objectives
	NO_2	NO_2	
Maximum 1-Hour Mean	110.1 µg/m^3	96.3 µg/m^3	-
No. 1-Hour Mean > 200 µg/m^3	0	0	200 µg/m^3; no more than 18 exceedances
Period Mean	34.1 µg/m^3	29.9 µg/m^3	40 µg/m^3
Data Capture	90.4%	93.5%	-

[a] Nitrogen oxides concentrations are provided in Appendix 1.

3.7 Table 4 includes the distribution of the 1-hour mean values into the different pollution bands (DAQI). All of the measured 1-hour mean nitrogen dioxide concentrations fell into the 'Low' pollution band during January to March 2018, at both monitoring sites.

[1] It is inevitable that a small amount of data will be "lost" in each year due to routine downtime for calibrations and site servicing.

Table 4: DAQI Bandings, January to March 2018

Band	Index	LCA-CAH	LCA-ND
Very High [a]	10		
High [a]	9		
	8		
	7		
Moderate [a]	6		
	5		
	4		
Low [a]	3		
	2	145	93
	1	1807	1927

[a] Number of 1-hour values falling within band

3.8 Nitrogen dioxide concentrations for five monitoring sites across London for the period January to March 2018 are summarised in Table 5, and shown plotted in Figure 3. These sites range from central London (Bloomsbury and Eltham) to outer London (Bexley), with two in east London (Stratford). The measured period mean concentrations at London City Airport (34 µg/m^3 at LCA-CAH and 30 µg/m^3 at LCA-ND) were lower than those at Bloomsbury, Canning Town and Stratford (at 48 µg/m^3, 39 µg/m^3 and 39 µg/m^3 respectively) and higher than those measured at Eltham (21 µg/m^3) and Bexley (27 µg/m^3). These results are broadly consistent with the location of London City Airport between the areas of high concentrations in central London and lower concentrations towards the outskirts. The maximum 1-hour mean concentrations recorded at LCA-CAH and LCA-ND were lower than those at Bloomsbury, Eltham, Canning Town and Stratford, but higher than those recorded at Bexley.

Table 5: Nitrogen Dioxide (NO_2) Data Summary for London Monitoring Sites, January to March 2018 [a]

	Background Site				Roadside Site
	Bexley	Bloomsbury	Eltham	Canning Town	Stratford
Max. 1-hr Mean (µg/m^3)	91.3	126.9	152.9	122.4	135.8
No. 1-hr >200 µg/m^3	0	0	0	0	0
Period Mean (µg/m^3)	26.7	47.7	20.5	39.1	38.9
Data Capture (%)	99.2	98.4	98.8	98.8	99.4

[a] Data are provisional. Nitrogen oxides concentrations are provided in Appendix 1.

3.9 The concurrence of many periods of elevated concentrations at all sites (see Figures 2 and 3) suggests that pollution episodes were due to regional rather than local sources and that changing weather conditions across the region affected the dispersion and dilution of pollutants.

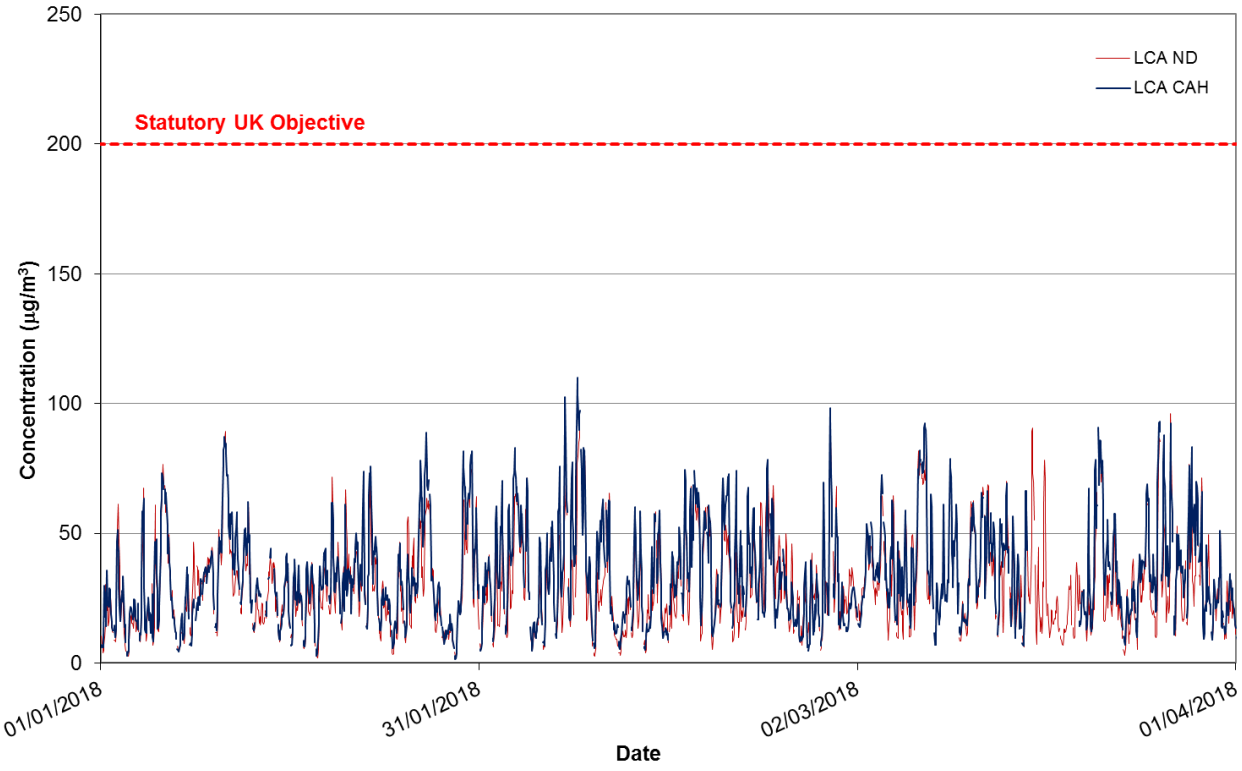

Figure 2: Hourly Mean Nitrogen Dioxide Concentrations at London City Airport, January to March 2018

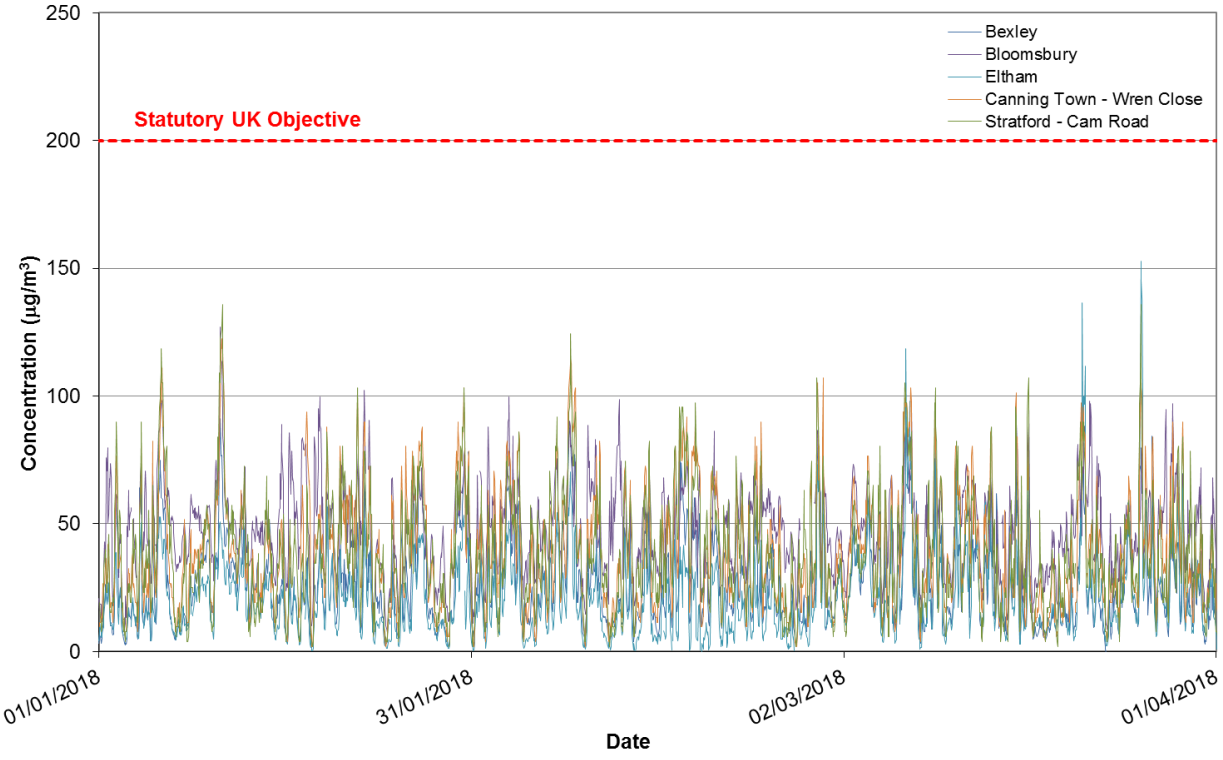

Figure 3: Hourly Mean Nitrogen Dioxide Concentrations at London Monitoring Sites, January to March 2018

Particulate Matter PM_{10}

3.10 The PM_{10} results for the period January to March 2018 for the LCA-CAH automatic monitoring station are summarised in Table 6. The 24-hour mean concentrations are plotted in Figure 4. Data capture was 95.2% during the period. The recorded period mean concentration (20.0 µg/m^3) was well below the objective value of 40 µg/m^3. There was a single measured exceedance of the 24-hour mean objective level of 50 µg/m^3, compared with the 35 exceedances allowed in a year. The 90th percentile of daily mean concentrations (30.0 µg/m^3) was below 50 µg/m^3.

Table 6: PM_{10} Data Summary for LCA-CAH, January to March 2018

Pollutant	TEOM, VCM-corrected PM_{10}	PM_{10} Objectives
Maximum 24-hour Mean	62.9 µg/m^3	-
Period Mean	20.0 µg/m^3	40 µg/m^3
No. 24-Hour Means >50 µg/m^3	1	50 µg/m^3; no more than 35 exceedances
90th Percentile	30.0 µg/m^3	50 µg/m^3
Data Capture	95.2%	-

3.11 Table 7 includes the distribution of the 24-hour mean values into the different pollution bands (DAQI). The majority of 24-hour mean measured PM_{10} concentrations fell into the 'Low' pollution band (98.8%) during January to March 2018; there was also one, 24-hour mean value within the 'Moderate' pollution band (1.2%). There were no 'High' or 'Very High' pollution events.

Table 7: DAQI Bandings for PM_{10}, January to March 2018

Band	Index	LCA-CAH
Very High [a]	**10**	
High [a]	**9**	
	8	
	7	
Moderate [a]	**6**	
	5	1
	4	
Low [a]	**3**	3
	2	49
	1	33

[a] Number of 24-hour mean values falling within band

3.12 PM_{10} concentrations for six sites across London for the period January to March 2018 are summarised in Table 8. These sites range from central London (Bloomsbury and Eltham) to outer

London (Bexley), with two in east London (Canning Town and Stratford). The measured period mean concentration at London City Airport (20.0 µg/m^3) was higher than at all other sites. A single 24-hour mean exceedance of 50 µg/m^3 was recorded at the LCA-CAH monitor, as well as at the Bloomsbury, Canning Town and Stratford monitors. No exceedances were observed at the Bexley (TEOM) site, while 2 exceedances were recorded at each of the Bexley (FDMS) and Eltham sites. The 90th percentile of 24-hour means at London City Airport was higher than those recorded at the Bexley (TEOM), Eltham, Canning Town and Stratford sites, but lower than those measured at the Bexley (FDMS) and Bloomsbury sites.

Table 8: PM_{10} Data Summary of London Monitoring Sites, January to March 2018 [a]

	Background Site					Roadside Site
	Bexley (TEOM)	**Bexley (FDMS)**	**Bloomsbury (FDMS)**	**Eltham (FDMS)**	**Canning Town (FDMS)**	**Stratford (FDMS)**
Maximum 24-hr mean (µg/m^3)	36.4	75.0	72.7	75.0	75.0	73.5
Period Mean (µg/m^3)	13.7	18.5	18.5	16.5	19.4	16.1
No. 24-hr mean >50 µg/m^3	0	2	1	2	1	1
90th Percentile	21.5	32.5	30.4	27.8	29.5	27.3
Data Capture (%)	98.6	90.7	90.7	81.6	99.9	99.0

[a] All values are reference equivalent. The TEOMs have been adjusted using the VCM.

3.13 As with nitrogen dioxide, the concurrence of many periods of elevated PM_{10} concentrations at all sites (see Figures 4 and 5) suggests that these episodes were due to regional rather than local sources and that changing weather conditions across the region affected the dispersion and dilution of pollutants.

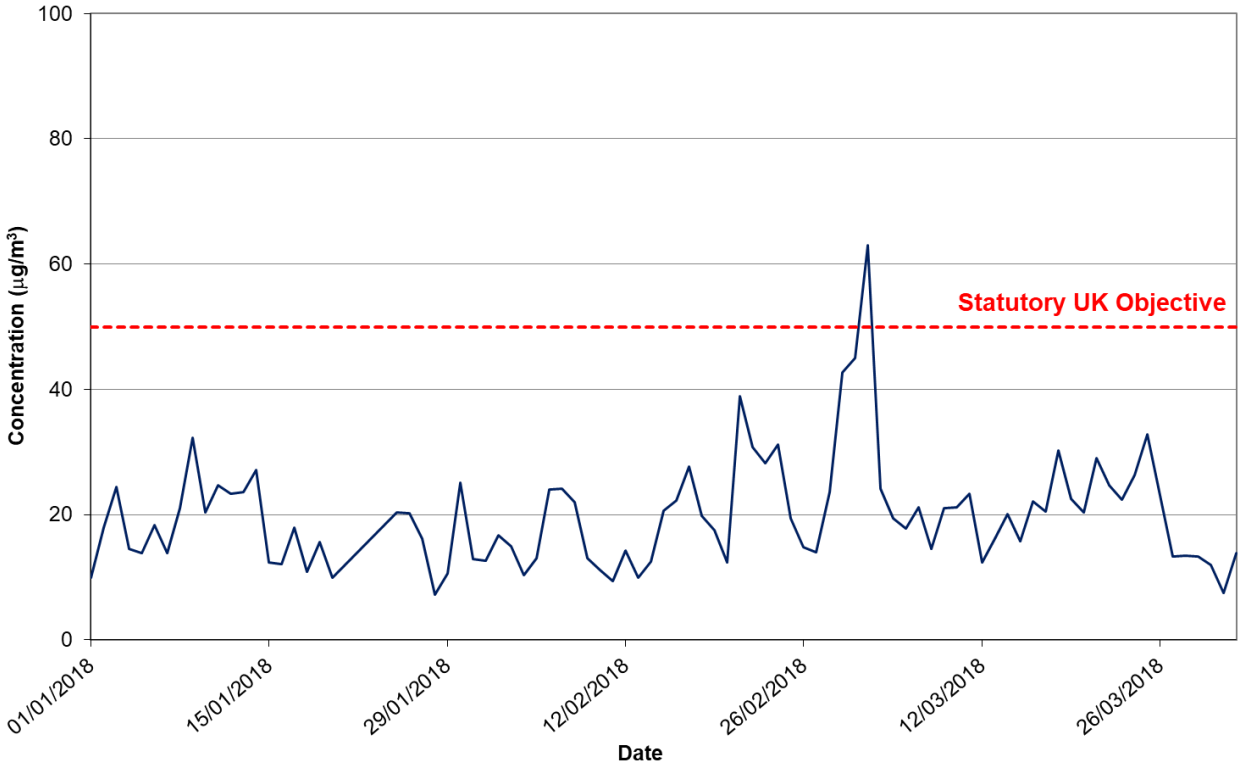

Figure 4: 24-hour Mean PM_{10} Concentrations at London City Airport (LCA-CAH), January to March 2018

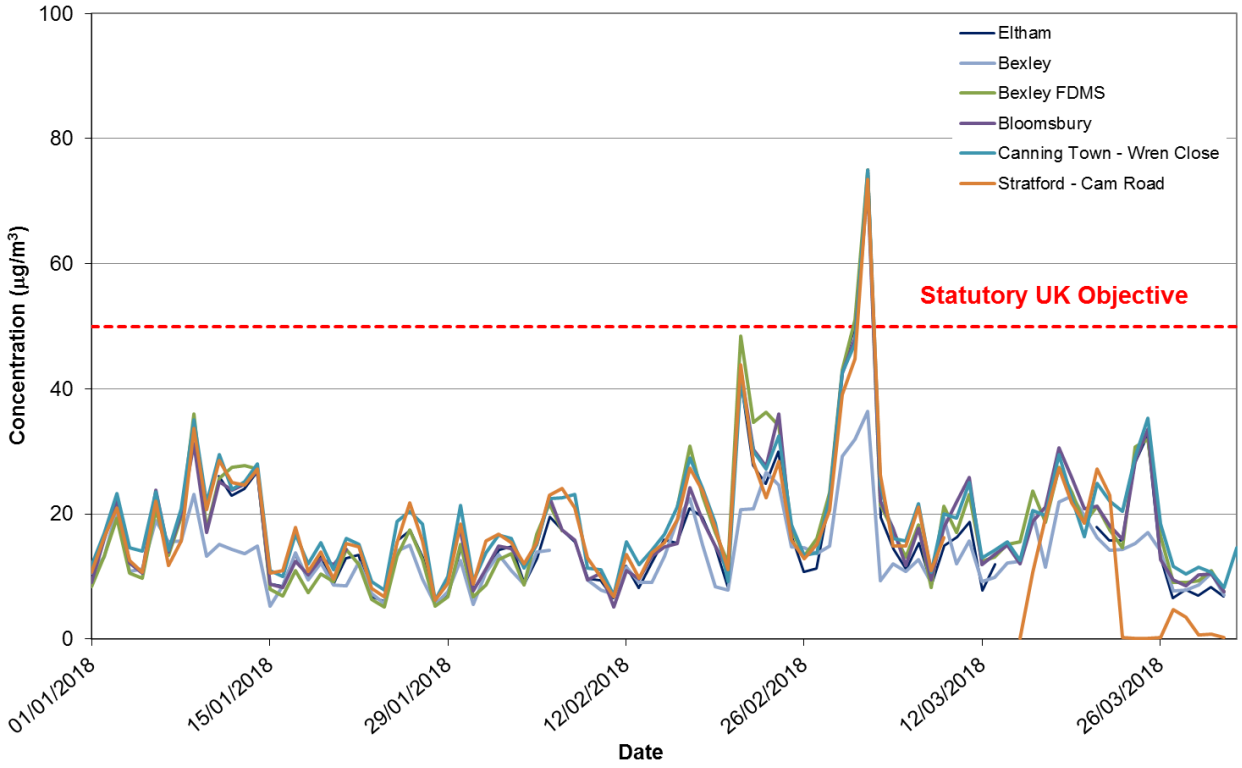

Figure 5: 24-hour Mean PM_{10} Concentrations at London Monitoring Sites, January to March 2018

Nitrogen Dioxide Diffusion Tube Network

3.14 London City Airport also operates a network of passive diffusion tube samplers for nitrogen dioxide. The intent of this network is to establish the wider spatial pattern of nitrogen dioxide concentrations in the area surrounding the Airport. The locations of the monitoring sites are shown in Figure 6, and are described in Table 9. The diffusion tubes are exposed for approximately 4-week intervals. They are supplied and analysed by Gradko Environmental, and are prepared using the 20% TEA in water method. The diffusion tubes record monthly mean concentrations, which have been averaged to give the period mean for January to March 2018.

Table 9: Description of Diffusion Tube Monitoring Sites [a]

Location	Site ID
Lamp post at top of Parker Street, adjacent to housing	LCA 01
Lamp post on Camel Road, adjacent to nearest property on Hartmann Street	LCA 02
Lamp post on access road in Silvertown Quay. Approx. 36 metres from kerbside of main road	LCA 03
Lamp post at waterfront to east end of Newham Dockside	LCA 04
Lamp post on Straight Road, at kerbside	LCA 05
Lamp post on pedestrian walkway adjacent to nearest housing at Gallions Way	LCA 06
Landing Lights	LCA 07
Lamp post on Brixham Street	LCA 08
City Aviation House (triplicate tubes)	LCA 09
Jet Centre – airside	LCA 10
Lamp post at waterfront, eastern end of the University of East London	LCA 11
ILS, to north of runway and south of Royal Albert Dock	LCA 12
Lamp post at north west corner of Newham Dockside	LCA 13
Lamp post on waterfront at western end of Newham Dockside	LCA 14
Lamp post at kerbside (approx 1 m) of Royal Albert Way	LCA 15
Newham Dockside analyser (duplicate tubes)	LCA 18

[a] LCA-17 has been discontinued from January 2012 as the lamppost on which diffusion tubes were deployed has been removed. LCA-16 and LCA-19 have also been discontinued from January 2017 as the land on which the sites were located has been vacated for construction works.

3.15 It is important to note that not all of these monitoring sites represent relevant public exposure for annual mean concentrations of nitrogen dioxide; thus the objectives are not strictly applicable at all of these sites. For instance, the sites at Landing Lights (LCA 07), the Jet Centre (LCA 10) and the ILS (LCA 12) are located on land that is not generally accessible by the public, or is owned by the Airport. The sites at LCA 04 (at the waterfront of Newham Dockside), LCA 11 (at the waterfront of the University of East London) and LCA 13, 14 and 15 (in the vicinity of Newham Dockside and Royal Albert Way) would also not represent relevant exposure for annual mean concentrations

according to the criteria defined in LLAQM.TG(16)[2], but are relevant for the 1-hour mean objective. Site LCA 03 is located within an area of land allocated for redevelopment at Silvertown Quay, but public access is currently prohibited. These sites have been included in the study to better understand the spatial pattern of nitrogen dioxide concentrations around the Airport.

3.16 Diffusion tubes are known to show systematic bias in relation to automatic (reference) monitors. For this reason, a co-location study has been carried out, with triplicate tubes exposed alongside the inlet to the automatic monitor at LCA-CAH, and with duplicate tubes exposed in close proximity to the inlet of the LCA-ND automatic monitor. Comparison of the matched period results shows that the diffusion tubes were over-reading by an average of 16.0%. An adjustment factor of 0.862 has therefore been applied to all diffusion tube results to ensure that they give the best representation of true concentrations. The results from the triplicate tubes at LCA-CAH and the duplicate tubes at LCA-ND indicate overall "good" precision (±5.8% and ±10.2% respectively) for the period January to March 2018.

3.17 The bias-adjusted results are summarised in Table 10, and also shown in Figure 7. It is not possible to compare the measured concentrations with the objectives, as these apply to a calendar year; however, the annual mean objective value of 40 µg/m^3 was not exceeded at the majority of the monitoring locations during the January to March 2018 period; the objective value was only exceeded at a single location (LCA 10) where there is no relevant public exposure.

3.18 No data was recorded at diffusion tube LCA 03, at Silvertown Quays due to restricted access during the monitoring period.

[2] Defra Technical Guidance Note LLAQM.TG(16) suggests that in the case of the annual mean objective, relevant locations should not include kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.

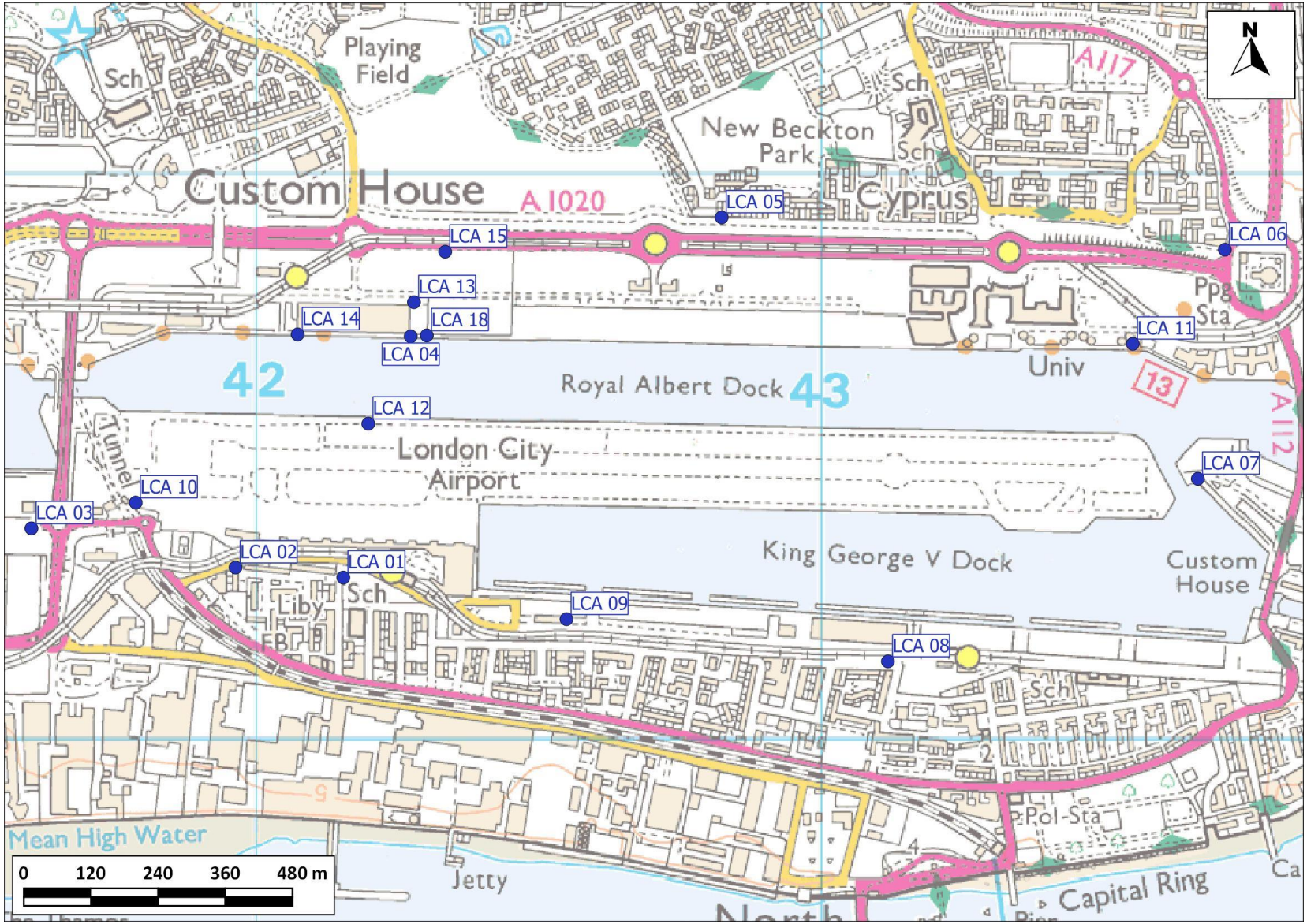

Figure 6: Diffusion Tube Monitoring Locations (blue dots) © Crown copyright and database right 2018. Ordnance Survey licence number 100046099.

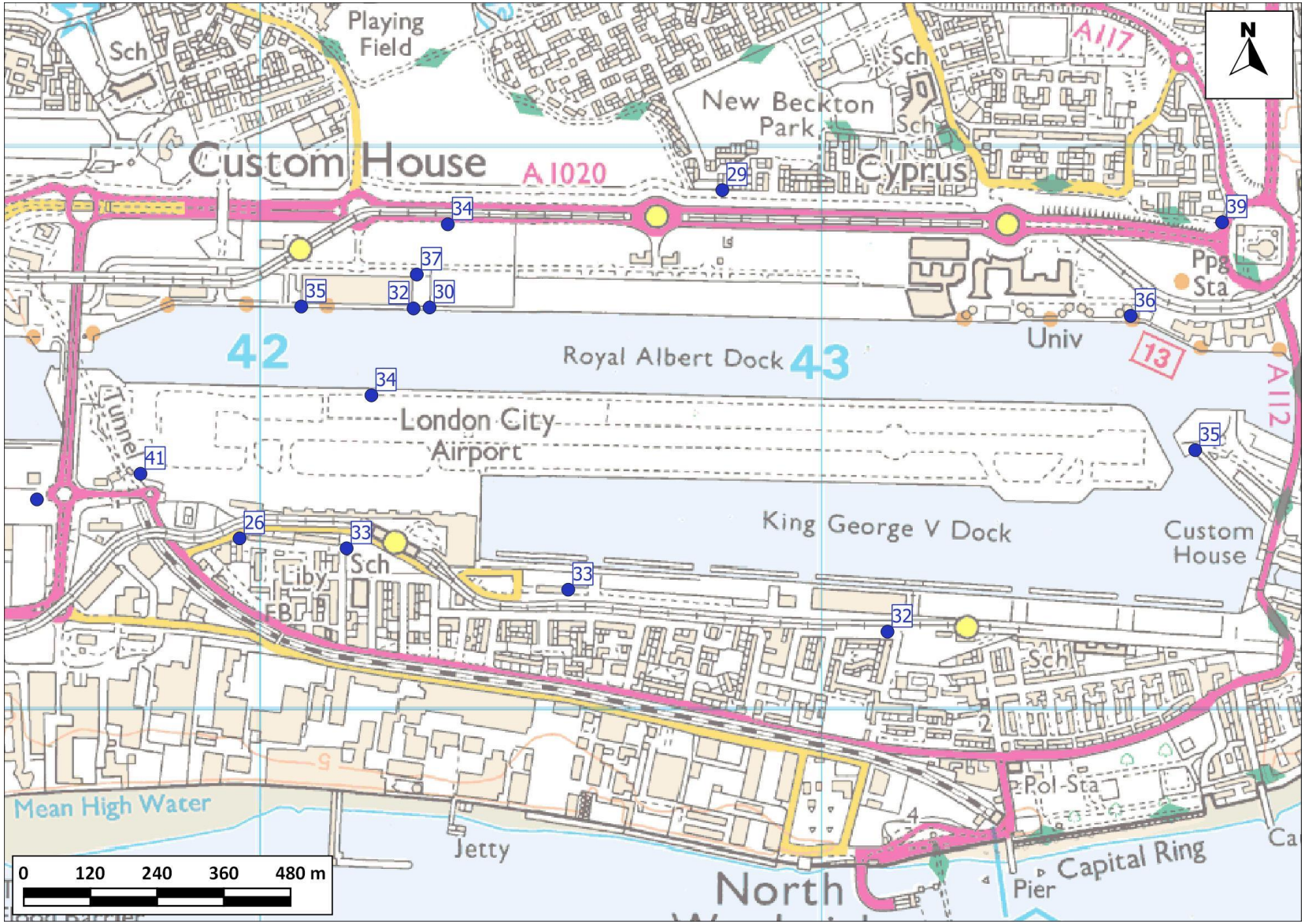

Figure 7: Nitrogen Dioxide Diffusion Tube Results, January to March 2018 (µg/m^3)

Table 10: Diffusion Tube Data Summary for London City Airport, January to March 2018 (Adjusted for Bias)

Site ID	Adjusted Value (µg/m^3) [a]
LCA 01	33.0
LCA 02	25.9
LCA 03	– [b]
LCA 04	31.9
LCA 05	28.7
LCA 06	38.5
LCA 07	35.4
LCA 08	32.0
LCA 09	33.3
LCA 10	**40.6**
LCA 11	36.2
LCA 12	34.4
LCA 13	37.3
LCA 14	35.1
LCA 15	33.9
LCA 18	29.8

[a] Data have been adjusted using a local bias adjustment factor for January to March 2018 of 0.862. The co-location studies are carried out at LCA-CAH using triplicate tubes and at LCA-ND with duplicate tubes located at the automatic monitor. Diffusion tubes were exposed for the period between 8th January and 6th April 2018. Values in bold are above the objective level.

[b] It was not possible to access this monitoring site during the period of exposure, and therefore no measurements have been made at this location.

4 Summary and Conclusions

4.1 The January to March 2018 period mean nitrogen dioxide concentrations measured at the LCA-CAH and LCA-ND automatic monitoring sites were 34.1 µg/m^3 and 29.9 µg/m^3, respectively, and within the range of concentrations measured at five other sites across London (21 to 47 µg/m^3).

4.2 The January to March 2018 period mean PM_{10} concentration measured at London City Airport was 20.0 µg/m^3, when adjusted using the VCM procedure, and marginally higher than the range measured at background sites elsewhere in London (14 to 19 µg/m^3).

4.3 Nitrogen dioxide concentrations measured during the three month period using diffusion tubes at 16 locations around London City Airport were within the range of 26 to 41 µg/m^3.

5 References

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6 Glossary

Exceedance	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective.
FDMS	Filter Dynamics Monitoring System.
LAQN	London Air Quality Network.
LCA-CAH	London City Airport – City Aviation House monitoring site.
LCA-ND	London City Airport – Newham Dockside monitoring site
μg/m^3	Microgrammes per cubic metre.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides (taken to be NO_2 + NO).
NO	Nitric oxide.
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date, taking into account costs, benefits, feasibility and practicality.
PM_{10}	Small airborne particles, more specifically particulate matter less than 10 micrometers in aerodynamic diameter.
Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal.
TEA	Triethanolamine – absorbent for nitrogen dioxide used in diffusion tubes.
TEOM	Tapered Element Oscillating Microbalance.
VCM	Volatile Correction Model.

A1 Appendix 1 – Nitrogen Oxides Results

A1.1 Nitrogen oxides (NO_x) concentrations, which are essentially the sum of nitrogen dioxide and nitric oxide, are presented in Table A1.1 for the automatic monitoring stations at London City Airport and for five sites across east London in Table A1.2. There are no relevant air quality criteria for nitrogen oxides in an urban area. Nitrogen oxides concentrations are included here for completeness, and because they are relevant for air quality modelling.

Table A1.1 Nitrogen Oxides (NOx) Data Summary for LCA-CAH and LCA-ND, January to March 2018

Site	LCA-CAH	LCA-ND
Maximum 1-Hour Mean	312 µg/m^3	317 µg/m^3
Period Mean	50.5 µg/m^3	42.1 µg/m^3
Data Capture	90.4%	93.5%

Table A1.2 Nitrogen Oxides (NOx) Data Summary for London Monitoring Sites, January to March 2018

Site	Bexley	Bloomsbury	Eltham	Canning Town	Stratford
Maximum 1-Hour Mean (µg/m^3)	247.0	234.0	201.8	416.9	491.5
Period Mean (µg/m^3)	35.2	64.5	26.5	56.8	64.7
Data Capture %	99.3	98.4	89.5	98.9	99.4