Hammersmith & Fulham Air Quality Annual Status Report for 2019
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This report provides a detailed overview of air quality in Hammersmith and Fulham during 2019. It has been produced to meet the requirements of the London Local Air Quality Management statutory process[1].

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[1] LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19)). https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/working-boroughs

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
CAZ	Central Activity Zone
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	**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
	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
	40 μg m^{-3}	Annual mean	31 Dec 2004
Particles - $PM_{2.5}$	25 μg m^{-3}	Annual mean	2020
	Target of 15% reduction in concentration at urban background locations	3 year mean	Between 2010 and 2020
Sulphur Dioxide (SO_2)	266 μg m^{-3} not to be exceeded more than 35 times a year	15 minute mean	31 Dec 2005
	350 μg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31 Dec 2004
	125 μg m^{-3} mot to be exceeded more than 3 times a year	24 hour mean	31 Dec 2004

Note: [1] by which to be achieved by and maintained thereafter

Figure 1: AQMA Boundary (entire borough)

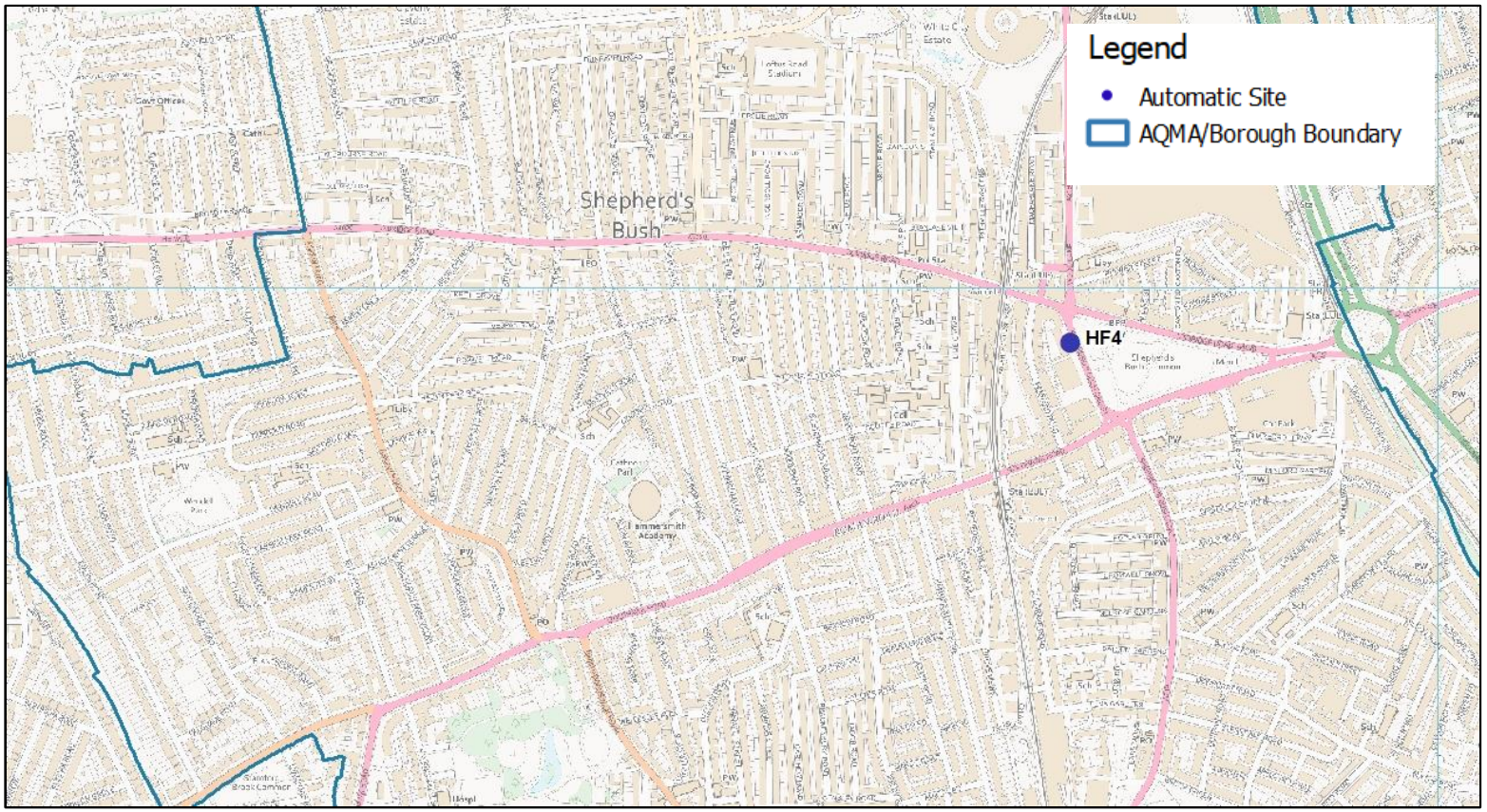
1. Air Quality Monitoring

1.1 Locations

Table B. Details of Automatic Monitoring Sites for 2019

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site to relevant exposure (m)	Distance to kerb of nearest road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
HF4	Shepherd's Bush	523313	179900	Roadside	Y	6	2	2	NO_2, PM_{10}	Chemiluminescent; TEOM
HF5	Hammersmith Town Centre	523343	178567	Roadside	Y	3.7	1.2	2.3	*NO_2, PM_{10}, $PM_{2.5}$ O_3*	Chemiluminescent, Continuous Beta-attenuation Particulate Monitor (BAM) for PM_{10} and $PM_{2.5}$, UV absorption

Figure 2: Shepherds Bush Automatic Monitoring Site



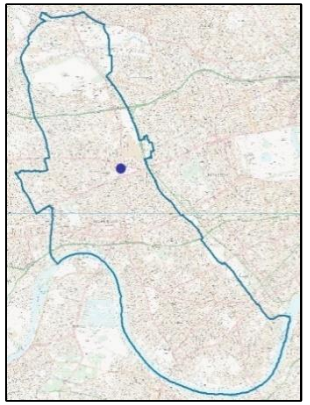


Figure 3: Hammersmith Town Centre Automatic Monitoring Site

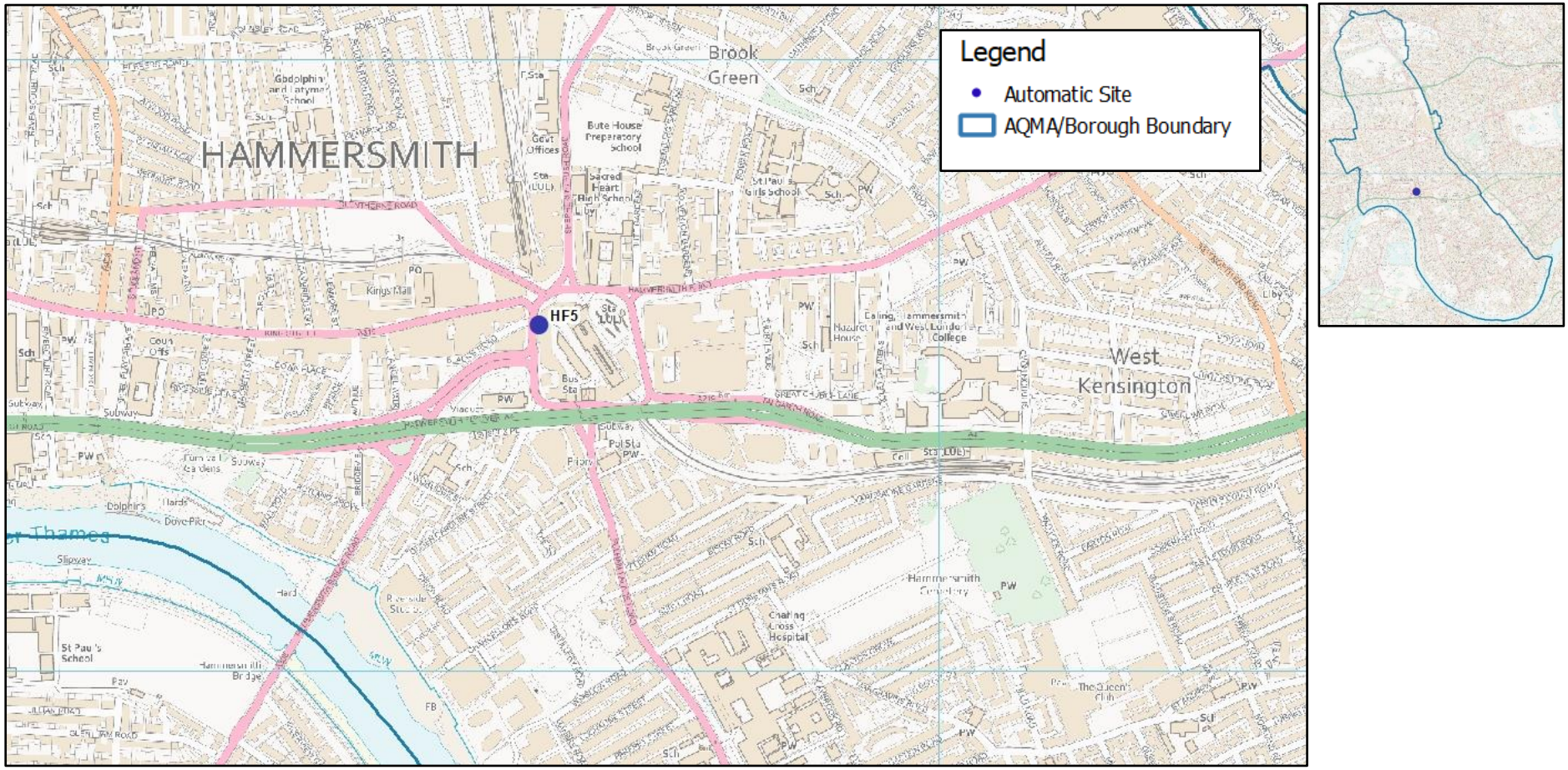


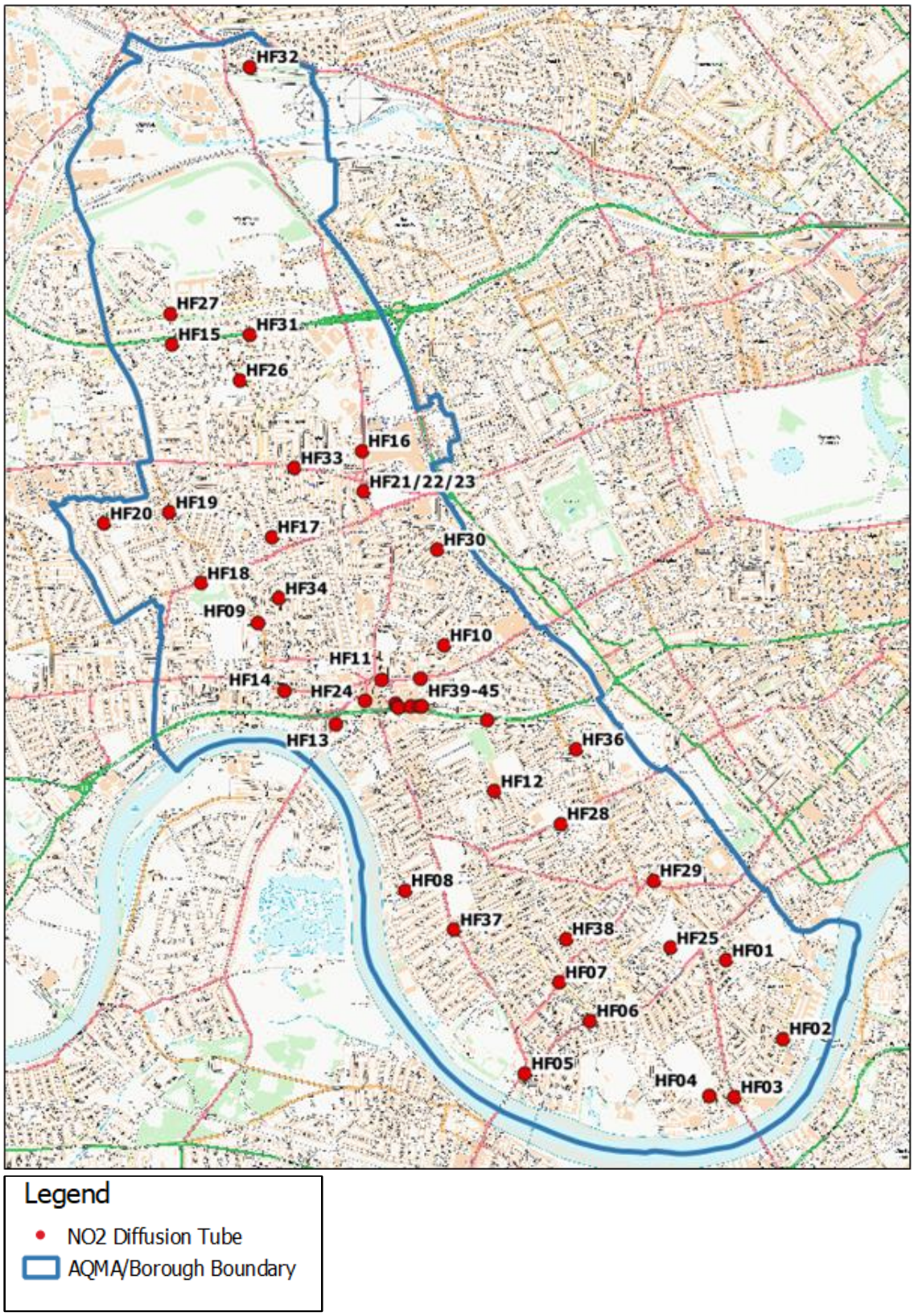
Table C. Details of Non-Automatic Monitoring Sites for 2019

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA?	Distance from monitoring site 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)
HF01	Bagleys Lane	525760	176732	Roadside	Y	5	1	2.5	NO_2	N
HF02	Townmead Road	526146	176205	Roadside	Y	5	1	2.5	NO_2	N
HF03	Wandsworth Bridge Road	525819	175810	Roadside	Y	5	1	2.5	NO_2	N
HF04	Hugon Road	525652	175821	Urban Background	Y	3	1	2.5	NO_2	N
HF05	Fulham High Street	524406	175969	Roadside	Y	5	2	2.5	NO_2	N
HF06	New Kings Road	524846	176325	Roadside	Y	5	1	2.5	NO_2	N
HF07	Fulham Road	524633	176585	Roadside	Y	3	1	2.5	NO_2	N
HF08	Lysia Street	523595	177206	Urban Background	Y	5	1	2.5	NO_2	N
HF09	Paddenswick Road	522606	179008	Roadside	Y	5	1	2.5	NO_2	N
HF10	Brook Green Road	523856	178863	Roadside	Y	5	1	2.5	NO_2	N
HF11	Hammersmith Road	523436	178632	Roadside	Y	0	5	2.5	NO_2	N
HF12	Greyhound Road	524200	177875	Roadside	Y	5	1	2.5	NO_2	N
HF13	Hammersmith Bridge Road	523129	178331	Roadside	Y	21	3	2.5	NO_2	N
HF14	Kings Street	522777	178551	Roadside	Y	3	1	2.5	NO_2	N
HF15	Hemlock Road	522024	180896	Roadside	Y	5	1	2.5	NO_2	N
HF16	Wood Lane	523305	180176	Roadside	Y	5	1	2.5	NO_2	N
HF17	Conningham Road	522693	179595	Roadside	Y	5	1	2.5	NO_2	N
HF18	Goldhawk Road	522220	179281	Roadside	Y	5	1	2.5	NO_2	N
HF19	Askew Road	522006	179760	Roadside	Y	5	1	2.5	NO_2	N
HF20	Lefroy Road	521564	179685	Urban Background	Y	3	1	2.5	NO_2	N
HF 20/21/23	Shepherd's Bush AQMS	523313	179900	Roadside	Y	6	2	2.5	NO_2	Y – Triplicate co-location
HF24 (HF32)	Queen Caroline Street	523329	178484	Roadside	Y	5	1	2.5	NO_2	N

HF 25 (HF44)	Eel Brook Common	525386	176816	Urban Background	Y	45	32	2.5	NO_2	N
HF 26 (HF45)	Bryony Road	522480	180655	Urban Background	Y	8	1	2.5	NO_2	N
HF27 (HF47)	Wulfstan Street	522013	181106	Roadside	Y	3	1	2.5	NO_2	N
HF28 (HF48)	Lillie Road	524647	177657	Roadside	Y	3	1	2.5	NO_2	N
HF29 (HF50)	Fulham Broadway	525273	177273	Roadside	Y	3	4.7	2.5	NO_2	N
HF30 (HF53)	Addison Gardens	523801	179498	Urban Background	Y	5	1	2.5	NO_2	N
HF31 (HF54)	Bloemfontein Road	522550	180963	Roadside	Y	5	3	2.5	NO_2	N
HF32 (HF60)	Waldo Road	522550	182790	Urban Background	Y	4	1	2.5	NO_2	N
HF33 (HF61)	Uxbridge Road	522850	180060	Roadside	Y	3	1	2.5	NO_2	N
HF34 (HF62)	Cardross Street	522745	179179	Urban Background	Y	3	1	2.5	NO_2	N
HF35 (HF63)	Talgarth Road	524148	178358	Roadside	Y	5	1	2.5	NO_2	N
HF36 (HF64)	North End Road	524747	178158	Roadside	Y	3.7	1	2.5	NO_2	N
HF37 (HF65)	Fulham Palace Road	523926	176940	Roadside	Y	5	1	2.5	NO_2	N
HF38 (HF66)	Radipole Road	524680	176880	Urban Background	Y	5	1	2.5	NO_2	N
HF39	Butterwick (a)	523529	178470	Roadside	Y	5	1	2.5	NO_2	N
HF40	Butterwick (b)	523536	178448	Roadside	Y	5	1	2.5	NO_2	N
HF41	Butterwick (c)	523554	178444	Roadside	Y	11	1	2.5	NO_2	N
HF42	Shortlands (a)	523696	178642	Roadside	Y	9	11	2.5	NO_2	N
HF43	Shortlands (b)	523633	178446	Roadside	Y	9	3	2.5	NO_2	N
HF44	Shortlands (c)	523687	178446	Roadside	Y	11	3	2.5	NO_2	N
HF45	Shortlands (d)	523705	178448	Roadside	Y	10	3	2.5	NO_2	N

During 2018 a number of the diffusion tube monitoring sites were re-named to provide consistency within the current network, where Site ID's were updated the sites previous Site ID (as was presented within the 2018 ASR are provided in brackets).

Figure 4: Non-Automatic Monitoring Sites



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, the details of which are described in Appendix A.

Table D. Annual Mean NO_2 Ratified and Bias-adjusted Monitoring Results (µg m^{-3})

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})							
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]	2019 distance corrected
HF4	Automatic	100	100	**76.2**	**80.3**	**76.0**	**78.9**	**77.0**	**71.0**	**60**	**49.9**
HF5	Automatic	97.3	81	-	-	-	-	-	-	**53**	**48.2**
HF01	DT	83.3	83.3	-	-	-	-	37.4	33.1	36.7	32.5
HF02	DT	100	100	-	-	-	-	**47.5**	**46.9**	**49.2**	**41.4**
HF03	DT	100	100	-	-	-	-	**87.1**	**74.3**	**76.9**	**57.4**
HF04	DT	*100*		-	-	-	-	30.0	27.6	28.3	-
HF05	DT	58.3	58.3	-	-	-	-	**54.3**	**53.1**	**48.8[C]**	**41.2**
HF06	DT	100	100	-	-	-	-	**56.3**	**45.5**	**46.8**	38.5
HF07	DT	91.7	91.7	-	-	-	-	**61.0**	**53.4**	**59.6**	**49.6**
HF08	DT	100	100	-	-	-	-	27.9	27.1	27.4	-
HF09	DT	91.7	91.7	-	-	-	-	**44.4**	**42.2**	35.5	31.9
HF10	DT	100	100	-	-	-	-	35.7	32.0	31.3	-
HF11	DT	100	100	-	-	-	-	**78.6**	**74.8**	**69.1**	**69.1**
HF12	DT	100	100	-	-	-	-	34.2	32.2	32	29.3
HF13	DT	83.3	83.3	-	-	-	-	**64.1**	**48.4**	35.8	34.1
HF14	DT	91.7	91.7	-	-	-	-	**60.1**	**51.9**	**53.8**	**46.6**
HF15	DT	100	100	-	-	-	-	35.1	31.1	31	30.3
HF16	DT	91.7	91.7	-	-	-	-	**58.9**	**51.5**	**51.2**	**43.3**
HF17	DT	100	100	-	-	-	-	**40.2**	35.3	36.1	32.3

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})							
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]	2019 distance corrected
HF18	DT	100	100	-	-	-	-	**60.8**	**49.3**	38.6	33.9
HF19	DT	91.7	91.7	-	-	-	-	**57.5**	**50.1**	**49.7**	**41**
HF20	DT	100	100	-	-	-	-	31.4	30.3	32.2	-
HF 21/22/23	DT	80.6	80.6	-	-	-	-	-	**64.4**	**58.1**	**49.2**
HF24 (HF32)	DT	100	100	**90.0**	**78.8**	**77.5**	**79.9**	**72.9**	**62.2**	**55.6**	**47.3**
HF 25 (HF44)	DT	91.7	91.7	37.9	29.6	28.5	32.7	31.9	26.2	26.7	-
HF 26 (HF45)	DT	100	100	**42.6**	35.1	34.1	39.6	36.7	31.2	32.4	-
HF27 (HF47)	DT	91.7	91.7	**49.7**	**46.0**	**45.4**	**46.9**	**46.6**	39.8	39	35.1
HF28 (HF48)	DT	100	100	**50.5**	**49.1**	**44.5**	**52.3**	**44.8**	**41.7**	**40.5**	36
HF29 (HF50)	DT	83.3	83.3	**75.3**	**65.0**	**60.3**	**68.3**	**56.3**	**47.8**	**53.9**	**49.9**
HF30 (HF53)	DT	100	100	**41.6**	32.5	32.6	38.2	**42.1**	31.5	34.3	-
HF31 (HF54)	DT	100	100	**98.4**	**80.7**	**76.6**	**84.3**	**76.8**	**68.1**	**59.6**	**51.3**
HF32 (HF60)	DT	100	100	**42.8**	39.2	37.6	**40.8**	**40.6**	34.5	36.7	-
HF33 (HF61)	DT	100	100	**50.1**	**45.8**	**45.9**	**49.4**	**42.6**	38.7	37.3	34.4
HF34 (HF62)	DT	100	100	34.7	31.8	30.7	34.4	37.0	27.4	28.2	-
HF35 (HF63)	DT	100	100	**65.2**	**56.1**	**49.8**	**59.8**	**50.9**	**47.4**	**44.2**	39.4

Site ID	Site type	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})							
				2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]	2019 distance corrected
HF36 (HF64) [e]	DT	83.3	83.3	-	-	-	-	**58.8**	**54.2**	**51.8**	**45.2**
HF37 (HF65)	DT	100	100	**63.6**	**57.7**	**57.1**	**68.6**	**53.0**	**48.3**	**50.8**	39.8
HF38 (HF66)	DT	91.7	91.7	38.1	33.2	31.5	34.6	32.9	31.2	30.3	-
HF39	DT	100	100	-	-	-	-	-	**69.4**	**60.5**	**50.5**
HF40	DT	100	100	-	-	-	-	-	**57.1**	**50**	**43.8**
HF41	DT	100	100	-	-	-	-	-	**55.5**	**49.2**	**40.9**
HF42	DT	100	100	-	-	-	-	-	**50.0**	**47.4**	**44**
HF43	DT	100	100	-	-	-	-	-	**50.6**	**49.2**	**43.3**
HF44	DT	91.7	91.7	-	-	-	-	-	**51.0**	**46.8**	**41.2**
HF45	DT	83.3	83.3	-	-	-	-	-	**47.5**	**43.5**	39.4

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

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

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

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

The London Borough of Hammersmith and Fulham exposed diffusion tubes at 43 locations during 2019, which is the same as 2018. HF5 was the only site that had a data capture of less than 75%. All other monitoring sites had a data capture greater than 75%, and the overall data capture for the 42 sites was 96%. In 2019, background concentrations ranged between 32.4µg/m3 (HF26) and 36.7µg/m3 (HF32). Roadside concentrations ranged between 31.0µg/m3 (HF15) and 76.9µg/m3 (HF3).

The annual mean AQS objective was not exceeded at any of the nine qualifying background monitoring sites but was exceeded at 24 of the 34 of the qualifying roadside sites. This is a reduction in exceedance of three sites when compared to 2018. 8 of the 9 background sites had increased in concentration between 2018 and 2019, but all but one background site (HF20) decreased compared to 2017 concentrations. This may be reflective of the increase in bias adjustment factor this year of 1.02 compared to 0.98 that was used last year.

As can be seen within Table Q in the appendix, the 0.98 2018 factor was lower than the factor used by the borough for the previous six years. Bias adjustment is an important aspect of diffusion tube monitoring and all calculations, as detailed in Appendix A have been completed in line with LLAQM.TG(19) guidance.

Of the 34 Roadside locations, 10 of the 34 reported an increase in concentration between 2018-2019, however only 2 sites increased on 2017 concentrations and this may well reflect the fluctuation in the bias adjustment factor.

In addition to the reduction in NO2 concentration experienced at all diffusion tube locations, there was a significant reduction in the annual mean NO2 concentration experienced at the Shepherds Bush automatic monitoring site (HF4). The 60.0µg m-3 concentration monitored for 2019 was 11.0µg m-3 lower than the annual mean in 2018, and this is also the lowest annual mean recorded at HF4 for a period of seven years. In previous years it substantially exceeded the NO2 hourly mean Air quality objective. In 2019 a second monitoring station was installed at Hammersmith Town Centre, for the first year of monitoring 53.0µg m-3 concentration monitored.

Table E. NO_2 Automatic Monitor Results: Comparison with 1-hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Hourly Means > 200 µg m^{-3}						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
HF4	100%	100%	11(203.1)	0(179.1)	**19**	**33**	**20**	8	4
HF5	97.%	81%	-	-	-	-	-	-	2

Notes: Exceedance of the NO_2 short term AQO of 200 µg m^{-3} over the permitted 18 days per year are shown in **bold**.

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

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

The number of 1-hour NO_2 mean concentrations in excess of 200 µg m^{-3} during 2018 was recorded as four, this is below the permitted number of exceedances (**18**) associated with the AQO. This is the second time that, where the NOx analyser has had a valid data capture (data capture was 53% in 2013 and 21% in 2014), that the monitoring site has been compliant with the 1-hour mean AQO. can be seen that there has been a downward trend from 2012 to 2018.

For 2013 and 2014 the actual number of 1-hour means in excess of the AQO have been plotted rather than the 99.8th percentile value, due to the data capture being low for these two years there may have been further exceedances experienced. Due to the low data capture at the site during 2013 and 2014 the trend representative of the true monitoring site conditions can only be analysed between 2015 and 2019. Between these years there is the beginning of a downward trend, although an increase of the 2015 values was experienced in 2016 and 2017, an overall reduction is shown between 2016 and 2019.

Table F Annual Mean PM10 Automatic Monitoring Results (µg m^{-3})

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
HF4	99%	99%	36.4	26.5	25.0	27.4	38.0	26.4	25
HF5	93.6%	78%	-	-	-	-	-	-	22

Notes: Exceedance of the PM_{10} annual mean AQO of 40 µg m^{-3} are shown in **bold**.

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

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

The annual mean concentration of PM_{10} does not present a clear trend across the seven year period whereby monitoring data is presented for. The concentration ranges between a maximum of 38.0 µg m^{-3} in 2017 to a minimum of 25.0 µg m-3 in 2019, equating to a range of 13 µg m^{-3}. During the seven year period the AQO of 40 µg m^{-3} has not been exceeded, the 2018 annual mean concentration was 66% of the AQO.

Table G. PM_{10} Automatic Monitor Results: Comparison with 24-Hour Mean Objective

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Number of Daily Means > 50 µg m^{-3}						
			2013[c]	2014[c]	2015[c]	2016[c]	2017[c]	2018[c]	2019[c]
HF4	99%	99%	33 (59.5)	0 (38.2)	10	17	14	4	11
HF5	93.6%	78%							5

Notes: Exceedance of the PM_{10} short term AQO of 50 µg m^{-3} over the permitted 35 days per year or where the 90.4th percentile exceeds 50 µg m^{-3} are shown in **bold**. Where the period of valid data is less than 85% of a full year, the 90.4th percentile is shown in brackets after the number of exceedances.

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

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

The number of daily means in excess of 50 µg m^{-3} during 2019 was 11, thus compliance with the short term PM10 AQO was achieved. Notwithstanding years 2013 and 2014 where poor data capture was experienced, the compliance with the Air Quality Objective has been achieved at HF4 for all years since 2015 but there is not a clear trend with the number of exceedances ranging between 17 and four.

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

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean Concentration (µg m^{-3})						
			2013[c]	2014 [c]	2015[c]	2016 [c]	2017[c]	2018[c]	2019 [c]
HF5	90.5%	75%	-	-	-	-	-	-	15

Notes: Exceedance of the $PM_{2.5}$ annual mean AQO of 25 µg m^{-3} are shown in **bold**.

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

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

Table I. O_3 Automatic Monitor Results: Comparison with Objectives

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	8 hour running mean > 100 µg m^{-3}
HF5	96%	79%	0

Exceedances of the O_3 AQOs are shown in **bold** (8 hour running mean >100=10 = 35 allowed a year))

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

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

2. Action to Improve Air Quality

2.1 Air Quality Action Plan Progress

Table J provides a brief summary of Hammersmith & Fulham progress against the Air Quality Action Plan, showing progress made this year.

Table J. Delivery of Air Quality Action Plan Measures

Measure	Action	2019 Progress • Emissions/Concentration data • Benefits • Negative impacts / Complaints
Reducing Emissions at its source	***1. Encourage improved availability of alternative fuels***	a) The Council has around 140 Source London on-street electric vehicle charge points. These generated more than 12,000 activated sessions in H&F in 2019. b) The Council has installed further rapid charge points on-street (two) and a further multi-point rapid charge point (three) is currently being installed. c) Supporting EV ownership growth in the borough the Council, working closely with residents, has installed a further 100 lamp column charge points for residential use in 2019/20. With GULCS funding secured the network will expand by around another 140 charge points in 2020. d) H&F are part of the Innovate UK consortium VPACH2. This will secure a further 50 charge points in residential areas in 2020/21.
Reducing Emissions at its source	***2. Provide incentives for use of alternative fuels***	Work has progressed on the introduction of emissions-based parking charges for all parking, including a diesel surcharge and it is expected this will progress to realisation in 2020/21 having now been approved by Cabinet. Free parking permits continue to be provided for fully electric vehicles.
Reducing Emissions at its source	***3. Promote travel plans to encourage a switch to low emission vehicles***	Westtrans monitoring officer continues to work one day a week to ensure work travel plan conditions or s106 obligations are being complied with and reviews carried out including examining whether target reductions are being met. As part of Hammersmith BID MAQF business LEN Project the Council engaged with businesses, on developing last mile zero emission delivery schemes H&F launched 'Parcels Not Pollution' a ground-

		breaking scheme that reduces the number of goods vehicles travelling into and within our town centres. Good are redirected from source to a freight hub outside of the borough, consolidated and re-delivered by ecargo-bike for the last mile to customers across the borough. In the first 6 months of the pilot scheme 1000 packages were delivered using PnP and during the COVID-19 lockdown the scheme has pivoted to supporting food package distribution by H&F Foodbank. A number of the council's services use the service with plans to support more services, reducing the council's direct emissions. It was announced June 2019 that the bid to the Mayor's Air Quality Fund 3 for a Zero Emissions Network in Hammersmith Town Centre was successful. The ZEN will support businesses to switch to zero/low emission vehicles in Hammersmith and facilitate more sustainable energy choices.
Reducing Emissions at its source	***4. Reduce emissions from the Council fleet***	As detailed in action 3 response, Hammersmith BID MAQF business LEN Project involved the Council engaging with businesses, on developing last mile zero emission delivery schemes. H&F launched 'Parcels Not Pollution' a ground-breaking scheme that reduces the number of goods vehicles travelling into and within our town centres. A number of the council's services use the service with plans to support more services, reducing the council's direct emissions. The Councils waste contractors' fleet has implemented the following measures: • Serco continue to be FORS Bronze accredited. Serco drivers continue to receive regular CPC training. • Contract extension has set new fleet requirements to be achieved in 2020 and will be expecting delivery of 15 electric vehicles and 1 Hybrid vehicle by the end of 2020. All light vehicles being changed from diesel to electric. • All Serco vehicles will be LEZ and ULEZ compliant by September 2020. • Procurement of future waste contract will specify low emission vehicles as part of commissioning process. *Other changes:* • Council fleet reduced. 5 Petrol driven scooters removed plus one petrol and one diesel light fleet. • Work ongoing to increase available electric charging capacity in council depot. 14 charge points being upgraded. • Council fleet currently meet all LEZ and ULEZ standards • Programme in place to reduce council fleet and move towards net zero emission by 2022. • Council Green Fleet strategy being developed.

		The council offered monthly Dr Bike sessions for their employees to encourage cycling and continued to offer access to the Santander dockless bike scheme through a council supported token scheme.
Reducing Emissions at its source	***5. Seek a reduction in emissions from the bus fleet***	Electrification of the 94 Bus route (February 2020) that crosses the borough along Goldhawk Road/Shepherd's Bush Green / Uxbridge Road. This was West London's first all-electric bus route. https://tfl.gov.uk/info-for/media/press-releases/2020/february/-first-all-electric-double-deck-bus-route-in-west-london-to-improve-air-quality
Reducing Emissions at its source	***6. Encourage the use of vehicles with smaller, more efficient engines***	Work has progressed on the introduction of emissions-based parking charges for all parking, including a diesel surcharge and it is expected this will progress to realisation in 2020/21 having now been approved by Cabinet. H&F launched 'Parcels Not Pollution' a ground-breaking scheme that reduces the number of goods vehicles travelling into and within our town centres. Good are redirected from source to a freight hub outside of the borough, consolidated and re-delivered by ecargo-bike for the last mile to customers across the borough. In the first 6 months of the pilot scheme 1000 packages were delivered using PnP and during the COVID-19 lockdown the scheme has pivoted to supporting food package distribution by H&F Foodbank. A number of the council's services use the service with plans to support more services, reducing the council's direct emissions.
Reducing Emissions at its source	***7. Seek to reduce emissions from larger vehicles (Low Emission Zone)***	The Council implemented in 2019/20 the DEFRA funded Clean Air Villages 2 (CAV2) project in Fulham Town Centre and Shepherd's Bush. **T**he work was undertaken by our project partner CRP with businesses and communities, to make their deliveries and servicing more efficient and generate less air pollution, using both individual and collective action. The CAV2 project has enabled further widespread and sustained action to reduce emissions resulting from the delivery of goods and services to businesses in 13 of London's most polluted town centres ('villages'). The focus for CAV2 in Fulham Town Centre was to find a physical solution such as a cargo bike delivery scheme or a shared electric van for businesses to reduce emissions from vehicle movements. Overall, CRP engaged with 40 businesses in the focus area as shown in Figure 20. Of these, 12 completed the survey. After completion of the survey and workshop the best solution was determined to be a shared electric van which will be funded by the council for the first year and will be free for businesses to use. Fulham Broadway shopping Centre have provided a parking space for the electric van. The launch of the shared EV is due to be August 2020, delayed due to the impact of the pandemic.

		For Shepherd's Bush 12 days of engagement from August 2019 to February 2020 in the area including walks-ins to 39 businesses. A survey was utilised as well as 1-2-1s and a workshop to work on developing a local solution. It was decided that The Parcels Not Pollution scheme would be expanded into the Shepherds Bush area, in order to remode local deliveries. 11 businesses have signed up to use the cargo bike. Additionally, H&F were successful in their joint bid for DEFRA funding for CAV3. This is an expansion on Clean Air Village 1&2 Projects - engagement and behavioural change project to reduce emissions from the delivery of good and services for businesses, hospitals and communities.
Reducing Emissions at its source	***8. Seek to reduce emissions from badly maintained vehicles***	Experimental traffic order has been in place from November 2018 for 18 months which provides powers to traffic wardens to issue PCNs to drivers who are idling their engines in parking and loading bays, taxi ranks and any roads where waiting is restricted. The fine is £40 and increases to £80 when not paid within 14 days. Information on engine idling available on council webpages here https://www.lbhf.gov.uk/parking/parking-tickets-and-enforcement/idling-vehicles
Reducing Emissions at its source	***9. Encourage more environmentally friendly driving behaviour***	The Council continue in addressing speeding concerns across the borough with the aim to ensure compliance at locations where there has been highest exceedance of the speed limit, where there is a continuing record of collisions, and where residents have complained. This work has mainly consisted of converting speed "cushions" to more effective sinusoidal humps or the installation on speed humps following interest or requests received from residents. A minimum of 600 anti-idling signs were erected around the borough in 2019. All schools in the borough now have anti-idling signage. The amount of signs at each school is dependent on how many roads around it would allow waiting/parking. Signs were not placed where a school borders an A road with no wait/no load at any time restrictions are in force, because traffic are not allowed to stop there anyway. The Council will continue to participate in the three-year MAQF 3 No Idling project during the period 2019 to 2022. The Council as part of the MAQF2 No-Idling project organised and implemented one school vehicle idling action days during 2019 and Car Free day 20/09/2019.
Reducing Emissions at its source	***10. Seek a reduction in emissions of small particles from construction sites***	The Council continues to require demolition and construction management plans for major development sites, including the submission of a AQDMP (Air Quality Dust Management Plan) that includes a dust risk assessment as well as measures to minimise dust emissions and are required to follow the London Mayor's "The Control of Dust and Emissions During Construction and Demolition SPG, 2014.' This includes the requirements to meet NRMM criteria.

		Complaints of dust nuisance investigated as and when reported. 38 complaints were received in 2019 about construction/ demolition dust. Informal warning/advice is usually effective in securing improvements. The Stage IV NRMM emission standard was required by planning condition on 45 sites during 2019. The Council as part of MAQF2 NRMM compliance project during 2019/20. 14 site Audits were undertaken, 7 sites were self-compliant, 4 sites worked towards and achieved Compliance. The London Borough Hammersmith & Fulham achieved a Total Compliance status of 100% of those sites audited under the NRMM project. The Council will continue to participate in the MAQF3 NRMM compliance project for the three year period from 2019 to 2022.
Reducing Emissions at its source	***11. Seek a reduction in emissions from domestic and commercial properties***	Policy CC1 of the Local Plan requires sustainable energy measures to be included in major developments and encourages these measures in all other developments. Minimising energy use helps to not only reduce CO2 emissions from buildings but also other pollutants as well. On-site renewable energy use is also promoted in new developments and the most frequent technology deployed is PV panels and heat pumps which generate no local emissions. Use of Combined Heat and Power (CHP) units are only accepted where they can be used without having an unacceptable impact on air quality. After a successful transfer of all of its corporate estate FM function into an in-house model from an outsource total FM provider. The new Property and FM Department had a large task to reassess its whole estate and its assets. A full asset condition survey was carried out and a corporate strategy was put together which informed the Capital Forward Maintenance Plan to start replacing its aging plant with energy efficient being at its core of consideration. One notable capital project will be 145 Kings street. With the decant of H&F Town Hall building, now handed to developers for a 4-5-year full refurbishment to become its flagship BREEAM certified building, 145 Kings Street has become now the temporary site for all its public frontline services for the duration. It will undergo a full ventilation and heating replacement as well as replacing all lighting to increase energy efficiency. All the DECs certification was renewed with new advisory reports and funds were reserved within the Capital Program purely for sustainable projects and a program was developed for to all buildings falling below par to bring up to a minimum a “D” grade. Hard Services is still continuing its ethos focusing on all repairs, replacements and upgrades to predominantly optimise heating and cooling systems as well as water waste to help reduce the energy demand and wastage which has been very successful over the years.

Finally, Property and FM has gotten approval from Cabinet to proceed with its new energy framework from energy purchasing body LASER for the next four and half new years to purchase solely renewable energy for its corporate estate starting from 1st October 2020. It has also opened up avenues for added service and will be looking to further energy efficiency products and power purchase agreements.

Less residual waste produced per household results in less waste to be collected and less waste incinerated.

Christmas tree recycling for 2019/2020 was 81.9 tonnes.

Residual waste per household per year (Kg) (kg/hh/yr) has again declined during the year ending 2018/19:

- 2017/18 final = 419.61 kg/hh/yr
- 2018/19 provisional = 403.43 kg/hh/yr
- 2019/20 provisional = 376.46 kg/hh/yr

In 2019 there have been 47 bonfire complaints these were addressed by the Council's Environmental Health team and provide an opportunity for the council to engage with residents on the issue of air quality.

In 2019 in private homes 728 energy efficiency and insulation measures were implemented as detailed below:

Light bulbs installed	256
Power-down devices installed	28
Radiator panels installed	149
Draught proofing strips - doors installed	17
Draught proofing strips - windows installed	15
Door brushes installed	17
Letterbox brushes installed	5
Energy monitors	37
Shower heads installed	54
Save-a-flush bags installed	2
Shower timers installed	64
Swivel taps installed	12
Warm pack	67
Tap aerators installed	5

Reducing Emissions at its source	***12. Seek to control and minimise emissions from industrial premises***	Regulation duties continued in line with the LAPPC requirements. No complaints were received in 2019/20 regarding emissions from industrial sites regulated by the Council. No notices were served. Routine inspections also undertaken to ensure compliance with permits.
Reducing the Need to Travel	***13. Sustain and improve town & local centres, facilities and employment areas***	The 2018 Local Plan is still in place and policies that improve town centres etc are still being implemented to help provide facilities locally and discourage the need for people to travel to do shopping, for entertainment and recreation purposes etc. The Council's Local Implementation Plan (LIP3) for Transport was agreed by Cabinet in November 2018 was approved by the Mayor of London in February 2019. The LIP's key principles and projects include ensuring that sustainable modes (walking, cycling and public transport) are the main choice in the borough's regeneration areas, "Filtered permeability" in residential areas to prevent rat running and encourage walking and cycling, a TFK funded "Liveable Neighbourhoods project to reduce the dominance of motor traffic in North End Road, and longer term aspirations to replace Hammersmith Flyover with a tunnel, provide a new pedestrian/cycle bridge over the Thames at Imperial Wharf, and remove general traffic from the north side of Shepherds Bush Green.
Reducing the Need to Travel	***14. Seek to reduce the air quality impact of new development***	2018 Local Plan is still in place and policies that help reduce the need to travel and promote sustainable forms of transport are still being implemented to help reduce emissions. In 2019 as detailed in section 3 of the ASR the following number of sites were required to implement air quality mitigation via the development control process: 170 development sites with Mechanical Ventilation to reduce indoor exposure to poor air quality, 103 sites with zero emission plant , 45 sites with Air Quality Dust Management Plan (AQDMP) with stage IV NRMM emission standards (instead of the standard Stage lllA, a greater London requirement) and the use of ULEZ compliant vehicles, 63 sites with Low Emission Strategies, 48 sites with stricter diesel emergency generator emission standards. SPD Key Principle TR21 requires that all new developments that have the potential to have a detrimental impact during the demolition and construction phase will require a Construction Logistics Plan (CLP). The Council will apply a condition to the planning consent to ensure that a Construction Logistics Plan (CLP) and Demolition Logistics Plans(DLP) are submitted and approved before a planning permissions is implemented. The Construction Logistics Plan will be secured by condition or Section 106 agreement depending on the scale of the development. The Council's SPD requires that the CLP is in line with the Mayor's Construction Logistics Plan (2017) and requires how the development will: • Minimise the impact of construction traffic on nearby roads • Restrict construction trips to off peak hours only • Reduce the number of stationary vehicles on the highway and potential for idling vehicles, the need for control measures for stationary vehicles and potential idling.

Encouraging a Switch to Less Polluting Forms of Transport	***15. Promotion of bus services***	Further to Hammersmith bridge closure April 2019 it was necessary for a number of changes to be made to the bus routes impacted by the closure. An online consultation was available from May 2019-January 2020 at https://consultations.tfl.gov.uk/buses/hammersmith-bridge/ to allow those affected by changes to provide feedback to TfL. In September 2019 a dedicated helpline was set up for those living within a mile of the bridge using the Dial a Ride Service, to allow DaR users to travel by bus to the other side of the bridge.
Encouraging a Switch to Less Polluting Forms of Transport	***16. Promotion of other forms of public transport***	No update for 2019
Encouraging a Switch to Less Polluting Forms of Transport	***17. Promotion of cycling***	Following discussions with residents and businesses the proposed cycle superhighway was re-purposed to more reflect the needs of local residents and businesses. Following discussions with TfL a safer and greener route was proposed for the main alignment, where more family groups would be attracted to cycle into the town centre. Emphasis was also changed to ensure that more pedestrian space was created and greater accessibility for all residents. The scheme was also amended to include greater greening and Healthy Street elements. The council agreed at full council in December 2019 to support the revised proposed route and take it to detailed design and installation of the Safer Cycle pathway along King Street, Hammersmith Gyratory and Hammersmith Road. In addition, another route was also proposed alongside the A4 to provide a more continuous route for commuter cycling. The council continued to install additional secure cycle storage units throughout the borough and installed another 20 units each holding six bicycles securely. Another 100 Sheffield cycle stands were also installed in the borough. As part of the MAQF CABB project in 2018 an air quality and journey planner widget to promote active travel was produced for the H & F and can found on the Council website https://www.lbhf.gov.uk/environment/pollution-and-air-quality/air-quality-forecast-and-cleaner-air-route-finder. The page had 94 unique page views in 2019
Encouraging a Switch to Less Polluting Forms of Transport	***18. Promotion of Walking***	Further traffic calming measures to help compliance with 20mph limits were upgraded or introduced on Augustine Road, Wardo Avenue, Micklethwaite Road and Hazlebury Road. 20mph is one of the key factors in encouraging walking, by providing a less intimidating environment. In addition, new pedestrian crossings were installed in Townmead Road, Du Cane Road, and Charecroft Way

		Please see action 19 for H& F participation in the Urbanwise School Experts Travel sessions in which active travel (walking and cycling) is promoted to reduce vehicle emissions as a result of private car use on journeys to and from schools. As part of the MAQF CABB project in 2018 an air quality and journey planner widget to promote active travel was produced for the H&F and can be found on the Council website. (See https://www.lbhf.gov.uk/environment/pollution-and-air-quality/air-quality-forecast-and-cleaner-air-routefinder). Also, as part of the MAQF CABB during 2018 four clean air walking routes were produced for walking routes within the borough and can be seen at the journey planner webpage. The page had 94 unique page views in 2019.
Encouraging a Switch to Less Polluting Forms of Transport	***19. Encourage a reduction in car use for the journey to school***	924 children and 300 adults were given Bikeability and adult cycle training in the borough throughout the year. 70 schools have completed School Travel Plans and undertaken school travel surveys, and under the TFL STARS (Sustainable Travel: Active Responsible Safe) accreditation scheme, 12 have achieved Gold , 6 Silver, and 20 bronze. Council officers from Environmental Quality Team, Transport Officers. Road Safety and SUSTRAN bike officers attended 7 Urbanwise School Travel Expert sessions with schools across the borough. This involved discussing the results of the students travel projects and answering any question in respect to air quality. The work also included the promotion of the positive health impacts of low pollution routes to schools by using the walkit.com and active travel (walking and cycling) instead of travelling to school by private vehicles.
Encouraging a Switch to Less Polluting Forms of Transport	***20. Encourage a reduction in car use for the journey to work and business trips***	The Council continue to require Workplace travel plans continue by planning condition or s106 agreement for any new developments via Planning, which meet TfL criteria for travel plans. If the workplace was a school this was referred to the Hammersmith and Fulham School Travel Advisor, Westtrans has continued to work with businesses to develop workplace travel plans as part of this programme which was not obliged to have workplace travel plan for planning condition
Encouraging a Switch to Less Polluting Forms of Transport	***21. Control provision of on and off street parking to deter car commuting into and within the borough***	Work has progressed on the introduction of emissions-based parking charges for all parking, including a diesel surcharge and it is expected this will progress to realisation in 2020/21 having now been approved by Cabinet in June 2020.

Encouraging a Switch to Less Polluting Forms of Transport	***22. Encourage freight to be transported in a sustainable manner***	Further information can be found in respect to reducing vehicle emissions from freight in for CAV2 and projects as detailed in Action 7. The Council has continued working with the Hammersmith BID to introduce a zero-emission last mile delivery freight scheme in Hammersmith Town Centre as detailed in Action 6.
Make a More Efficient Use of Road Transport	***23. Encourage car sharing***	The Council continue to actively work with car club operators - Zipcar and City Car Club - to develop their existing on-street network, which currently stands at 50 locations in dedicated 'back to base' spaces. The Council was successful in its bid for Mayor's Air Quality Funding 3 for a Zero Emissions Network in Hammersmith, support for businesses to switch to zero/low emission vehicles in Hammersmith. The Council is developing proposals for floating car clubs, with the emphasis on electric cars.
Make a More Efficient Use of Road Transport	***24. Discourage short journeys***	H&F continue the programme of Controlled Parking Zone reviews and where demand exists controls are strengthened. If appropriate sub zones are created to better manage parking demand.
Other Measures to Reduce Road Traffic Emissions	***25. Reduce the amount of road traffic in residential areas and town centres***	The 2018 Local Plan is still in place and policies that help reduce the need to travel and promote sustainable forms of transport are still being implemented to help reduce emissions. Developments in areas well connected by public transport are expected to be car-free, with no parking provided, other than for disabled people. Where appropriate and in accordance with the aims of the London Plan the Council also encourages the provision of car club bays, especially those with restricted parking. Planning policies also require electric vehicle parking spaces for both residential and commercial uses – e.g. the requirement for residential developments is that 20% of all spaces must be for electric vehicles with an additional 20% passive provision for electric vehicles in the future. Cycling and walking are also encouraged by planning policies which require improvements to the environment and provision of facilities such as cycle parking and provision of support for cycle hire schemes. The council has been working with residents in Brackenbury, Hammersmith, following the Commonplace portal to identify measures that will impact on traffic and air quality issues in the area. The outcome is that a 'low traffic neighbourhood' programme of interventions has been developed that will be implemented once funding is available. This includes measures such as filtered permeable roads, closing off roads, and using speed cameras to stop rat running.

Other Measures to Reduce Road Traffic Emissions	***26. Promote the use of trees to help improve local air quality***	In 2019/20 the Council planted 22 new street trees and replaced 138 street trees. In Parks, Open Spaces and Cemeteries 40 standard sized trees at 2-3 metres high and 1480 whips at 1 metre or less in the form of saplings were planted. The Council have started a pruning programme to begin on two busy streets, Shepherd's Bush Road and Hammersmith Grove where 50% of trees were pruned in 2019/2020, and 50% will be pruned in 2020/2021 and then begin a three-year cycle. A three-year cycle will also be progressed in 2020/21 on Wansdworth Bridge Road where were all trees were pruned this in 2019 due to structural and other issues.
Other Measures to Reduce Road Traffic Emissions	***27. Reduce the amount of traffic on the A4 and A40***	Work is on-going to draft the Hammersmith SPD. The timing of the public consultation and adoption of the document are currently under review due to the impacts of Covid-19.
Raise Awareness of the Links Between Air Quality and Health	***28. Provide information to allow people to make informed choices about travel behaviour***	The Council continue to support AirTEXT and promote it to the public on our website and at events. There were 25 additional subscribers to airTEXT pollution alerts from January 2019. Subscribers receive alerts by text message (202 people) and voicemail (30 subscribers).
Raise Awareness of the Links Between Air Quality and Health	***29. Provide information so people can make informed choices about reducing pollution from domestic activities***	The Council as part of the MAQF2 No-Idling project organised and implemented one school vehicle idling action days during 2019 and Car Free day 20/09/2019.
Raise Awareness of the Links Between Air Quality and Health	***30. Continue to monitor air quality and make information available***	Breathe London AQMesh monitors were installed at three locations in the borough at Charing Cross Hospital, Fulham Palace Road and Bloemfontein Road. Information and data from the monitors is available at https://www.breathelondon.org/ Hammersmith negotiated an additional low-cost sensor to be located at Charing Cross Hospital as part of the Breathe London project in addition to the monitors located at Fulham Place Road and Bloemfontein Road as the council were able to support swift installation of monitors. The council supported the scheme

		providers in identifying suitable locations for the low-cost monitors and information on available electrical infrastructure to support sensor deployment. Provisional data from these sensors suggests Annual Average Fulham Palace road (NO2) 40.2 ug m3 and Bloemfontein 37.2 ug m3. PM2.5 data at Bloemfontein Road suggests an annual average of 7.6 ug m3. Melcombe Primary School in the borough was selected as one of 5 primary schools in London to conduct research into the impacts of air pollution on school children. As detailed on the news https://www.bbc.co.uk/news/uk-england-london-47622493 school children carried back packs that had inbuilt air quality sensors. Key findings of this wearables study available at https://www.breathelondon.org/wp-content/uploads/2019/10/BWL-Report-171019.pdf include that pupils were exposed to on average five time higher concentrations of harmful NO2 pollution on the school run then when they are at school. The report details the importance of children choosing low pollution walking or cycling routes to school and avoiding roads with higher pollution levels. Live access to the real time air quality monitoring stations is available on-line (See https://www.airqualityengland.co.uk/local-authority/?la_id=195) and links to this are provided on the Council website (See https://www.lbhf.gov.uk/environment/pollution-and-air-quality/air-quality The council continued to maintain 2 automatic monitors and its network of diffusion tubes. Data from the automatic monitor installed at Hammersmith town centre in March 2019 is reported for the first time this year.

3. Planning Update and Other New Sources of Emissions

Table K. Planning requirements met by planning applications in Hammersmith & Fulham in 2019

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	*21*
Number of planning applications required to monitor for construction dust	44
Number of CHPs/Biomass boilers refused on air quality grounds	0
Number of CHPs/Biomass boilers subject to GLA emissions limits and/or other restrictions to reduce emissions	110*
Number of developments required to install Ultra-Low NO_x boilers	265
Number of developments where an AQ Neutral building and/or transport assessments undertaken	21
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	21
Number of planning applications with S106 agreements including other requirements to improve air quality	0
Number of planning applications with CIL payments that include a contribution to improve air quality	0
NRMM: Central Activity Zone and Canary Wharf Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.	N/A
NRMM: Greater London (excluding Central Activity Zone and Canary Wharf) Number of conditions related to NRMM included. Number of developments registered and compliant. Please include confirmation that you have checked that the development has been registered at www.nrmm.london and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.	**45** conditions placed (We require higher CAZ Stage IV standard in Hammersmith & Fulham) **14** audited and compliant (Cleaner Construction for London Project) **19** registered in total April 2019-March 2020 NRMM webpage

*H&F impose stricter Emission Limits on majority of applications. E.g. Emission Standard at Reference O2 (mg Nm-3) <50 mg Nm-3 rather than 95 mg Nm-3

Table L Additional Air Quality Planning Conditions

Ventilation Strategy	170
Zero Emission Heating Plant (e.g. ASHP, Electric Boilers)	103
Low Emission Strategy	63
Emergency diesel generator emission standard	48
Green Infrastructure	17
Electric Vehicle Charging Points	13

The Council is participating in the MAQF3 NRMM compliance project for the three year period from 2019 to 2022, to ensure that NRMM conditions are enforced.

3.1 New or significantly changed industrial or other sources

No new sources identified

Appendix A Details of Monitoring Site QA/QC

A.1 Automatic Monitoring Sites

Data management and Local Site Operator (LSO) duties for Hammersmith & Fulham's automatic monitoring station have been completed by Ricardo Energy and Environment since November 2017. All real-time data from the monitoring station is independently collected and validated on a daily basis. A combination of automatic and manual checks is used to assess data, identify and diagnose potential equipment faults and adjust data to take account of calibration tests. Automatic overnight calibrations are supplemented with regular manual calibrations of analysers. The procedures used conform to the EU standards that are a requirement of the AURN.

All data is formally ratified and is available is available online by accessing the Air Quality England Website and selecting Hammersmith & Fulham within the 'Select local authority' menu bar. During this process the validation decisions can be ratified with the benefit of hindsight and using greater information, such as service records, calibration records and the results of station audits. Station audits are carried out by Ricardo Energy and Environments in house audit team.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

PM10 data from HF4 Shepherd's Bush presented in this report has been corrected to gravimetric equivalent using the Volatile Correction Model (VCM). The application of the VCM to the raw data is completed by Ricardo Energy and Environment through the current data management contract, therefore this is also true of any data that is presented on the Air Quality England website.

At Hammersmith Town Centre HF5 the equipment for monitoring PM is an unheated PM10 BAM and a smart heated PM2.5 BAM. Therefore, the corrections set out in LLAQM TG19 for the MetOne BAM will be applied (sections 4.43 to 4.47) and the PM10 data will be multiplied by 0.833 and no correction is applied to the PM2.5.

A.2 Diffusion Tube Quality Assurance / Quality Control

The diffusion tubes for the year 2019 were supplied and analysed by Gradko International, with the 50% Triethanolamine (TEA) in acetone preparation method utilised. Gradko is a UKAS accredited laboratory that follows the procedures set out by Defra within Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users, and strict internal QA/QC procedures to ensure that concentrations reported are as accurate as possible. In addition, Gradko participate in two independent QA/QC schemes to ensure their performance is constantly independently reviewed.

1) AIR-PT

AIR is an independent proficiency-testing (PT) scheme that is operated by LGC standards and supported by the Health and Safety Laboratory (HSL). AIR-PT began in April 2014 and combined two long running PT schemes: LGC Standards STACKS PT scheme, and the HSL WASP PT scheme. AIR is a recognised performance-testing programme for labs undertaking NO_2 diffusion tube analysis as part of a wider UK NO_2 monitoring network. The AIR-PT results for Gradko during 2019 are presented in Table M below, a 100% result was achieved for three of the four monitoring samples provided.

Further information on proficiency testing can be found at Defra's Local Air Quality Management webpages under QA/QC framework for NO_2 diffusion tube monitoring.

Table M Gradko Performance within AIR-PT for NO2 Diffusion Tubes-2019

AIR PT AR024	AIR PT AR025	AIR PT AR027	AIR PT AR028
January – February 2019	**April – May 2019**	**July – August 2019**	**September – October 2019**
75%	100%	100%	100%

2) Network Field Inter-Comparison Exercise

Gradko International also takes part in the NO_2 Network Field Inter-Comparison Exercise, operated by the National Physical Laboratory (NPL), which complements the AIR-PT scheme in assessing sampling and analytical performance of diffusion tubes under normal operating conditions. This involves the regular exposure of a triplicate set of tubes at an Automatic Urban Network site (AURN) site where continuous chemiluminescent analysers measure NO_2 concentrations.

The inter-comparison exercise is completed at the Marylebone AURN monitoring station. Of particular interest is the bias of the diffusion tube measurement relative to the automatic analyser that gives an indication of accuracy. Performance criterion have been established for participating laboratories in line with the Air Quality Directive 2008/50/EC requirement for indicative monitoring techniques, as the 95% confidence interval of the annual mean bias which should not exceed ±25%.

In conjunction with this, a measure of precision is determined by comparing the triplicate co-located tube measurements, commonly referred to as the coefficient of variation (CoV). This value is useful for assessing the uncertainty of results due to sampling and analytical techniques. The NPL performance criterion for precision is that the mean coefficient of variation for the full year should not exceed 10%, should this be achieved the precision is given a score of 'good'.

Gradko operates well within the required level of performance in terms of accuracy and precision, as shown by the results presented in Table N below.

Table N - Gradko NO2 Network Field Inter-Comparison Results for 2019

Annual Mean Bias		Precision	
Performance Target	**Gradko Annual Mean Bias**	**Performance Target**	**Gradko Precision**
±25%	+ 6.5%	10%	Good

Factor from Local Co-location Studies (if available)

Hammersmith & Fulham are part of the London Wide Environmental Programme (LWEP) for which a number of co-location studies are completed across seven London Boroughs. During 2019 triplicate diffusion tube monitoring was completed at the HF4 automatic monitoring station, and the co-location results were included within the LWEP bias adjustment calculations, as there was overall good data capture across the diffusion tube and automatic monitoring results, as shown in Table O.

Table O. Precision and Accuracy of Triplicate Tubes HF4

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2019	04/02/2019		69.5	64.3	67	3.7	6	33.1	74.56	99.85	Good	Good
2	04/02/2019	05/03/2019								78.77	99.14		Good
3	05/03/2019	02/04/2019	56.9	61.0	60.0	59	2.2	4	5.4	63.45	99.7	Good	Good
4	02/04/2019	30/04/2019	50.3	65.0	50.4	55	8.5	15	21.1	58.08	99.57	Good	Good
5	30/04/2019	04/06/2019	60.4	52.2	55.9	56	4.1	7	10.2	57	99.88	Good	Good
6	04/06/2019	02/07/2019	53.6	59.9	49.3	54	5.3	10	13.2	51	100	Good	Good
7	02/07/2019	06/08/2019		60.7	56.6	59	2.9	5	26.3	51	99.88	Good	Good
8	06/08/2019	04/09/2019	27.0	54.0	47.0	43	14.0	33	34.8	54	99.71	Poor Precision	Good
9	04/09/2019	02/10/2019		54.8	51.1	53	2.6	5	23.1	51	98.96	Good	Good
10	02/10/2019	06/11/2019	58.3	64.4	55.8	60	4.4	7	11.0	57	98.41	Good	Good
11	06/11/2019	03/12/2019	56.7	58.9	62.6	59	3.0	5	7.4	63.56	99.7	Good	Good
12	03/12/2019	07/01/2020		56.0	60.1	58	2.9	5	26.1	61.35	99.76	Good	Good
13													
										Overall survey -->		Good precision	Good Overall DC

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

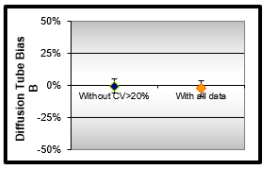
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	HF4

Precision	10 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 10 periods of data	
Bias factor A	1.01 (0.96 - 1.07)
Bias B	-1% (-7% - 4%)
Diffusion Tubes Mean:	58 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	59 μgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	59 (56 - 62) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	1.03 (0.97 - 1.1)
Bias B	-3% (-9% - 3%)
Diffusion Tubes Mean:	57 μgm^{-3}
Mean CV (Precision):	9
Automatic Mean:	58 μgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	58 (55 - 62) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Table P - Bias Adjustment Factor and % Bias of all LWEP Monitored Co-Location Studies 2019

London Borough	Site Location	Diffusion Tube	Continuous Analyser	Correction Factor (A)	% Bias based on continuous monitor (B)
Kensington	North Kensington	26.8	27.4	1.02	-2
LWEP	Bloomsbury	38.4	31.5	0.82	22
Hammersmith & Fulham	Shepherds Bush	57.0	60.0	1.02	-2
Croydon	Park Lane	53.2	44.3	0.83	20
Croydon	London Road	50.3	43.3	0.87	14
Greenwich	Eltham	20.2	17.3	0.85	17
Greenwich	Blackheath	40.7	38.5	0.95	6
Greenwich	Westhorne Av	37.5	33.8	0.90	11
Greenwich	Burrage	32.7	32.6	1.00	0
Greenwich	Woolwich Flyover	60.1	52.6	0.87	14
Greenwich	Bexley Falconwood	44.3	35.6	0.80	25
Newham	Cam Road	34.6	29.7	0.86	16
Overall % Bias					**11.62**
Overall Bias Adjustment Factor				**0.90**	

Discussion of Choice of Factor to Use

In previous years the bias adjustment factor used to adjust the NO_2 diffusion tube raw data has been taken from the co-location study completed at Royal Borough of Kensington and Chelsea AURN/LAQN affiliated site, North Kensington. This has previously been chosen as a Local Factor, rather than using the LWEP or National Bias Adjustment Factor.

The co-location study at HF4 passed the required QA/QC for bias adjustment and so this factor has been taken as a local adjustment factor at 1.02. This factor is higher than the LWEP or national factor and ensures recorded diffusion tube concentrations will be more conservative than if the general LWEP adjustment factor of 0.90 were used or if the national factor for the type of tube utilised is 0.89 from version number 06/20.

Previous factors used by Hammersmith & Fulham are presented in Table Q. The bias adjustment factor used in 2019 is lower than the previous seven years, this can be seen within the adjusted diffusion tube monitoring data presented in Table D.

Table Q - Bias Adjustment Factors used by Hammersmith & Fulham (2009-2019)

Year	Bias Adjustment Factor
2009	0.92
2010	0.93
2011	0.94
2012	1.01
2013	1.14
2014	1.03
2015	1.07
2016	1.15
2017	1.15
2018	0.98
2019	1.02

A.3 Adjustments to the Ratified Monitoring Data

Short-term to Long-term Data Adjustment

In regards to the 2019 diffusion tube data set, annualisation was required at one diffusion tube location HF05, this was due to the data capture at the diffusion tube being below 75%. Annualisation has been completed in line with Box 4.3 within LLAQM.TG(19) and full working details are presented in Table S. In completing the annualisation process, data has been taken from a number of automatic monitoring sites that are part of the LAQN/AURN. In line with LLAQM.TG(19) the monitoring sites that have been used lie within a radius of approximately 50 miles of the sites to be annualised and have a data capture of 85% or above.

All monitoring stations that were used are background monitoring stations and as such are not influenced by local sources of air pollution such as road traffic emissions at roadside monitoring sites. The monitoring sites that were used are listed in Table R.

Table R LAQN/AURN Monitoring Stations used for Annualisation

Pollutant	Background LAQN/AURN Sites used for Annualisation
NO_2	• Ealing Acton Vale – Urban Background (93% DC 2019) B1 • Wandsworth Putney – Urban Background (93% DC 2019) B2 • City Of London-Sir John Cass School (B3) (94% DC 2019)

Table S - Short-Term to Long-Term Monitoring Data Adjustment of HF05

Start Date 2019	***End Date 2019***	***B1***	***B1 when D1 available***	***B2***	***B2 When D1 available***	***B3***	***B3 When D1 available***	***D1***
9 January	*6 February*	37.7	37.7	48.2	*48.2*	41.7	41.7	53.7
6 February	*6 March*	35.8	*35.8*	48.9	*48.9*	46.9	46.9	55.8
6 March	*3 April*	26.3	*26.3*	45.7	*45.7*	47.4	47.4	*48.3*
3 April	*1 May*	30.3	*30.3*	43.0	*43.0*	47.0	47.0	*68.0*
1 May	*5 June*	21.2	*21.2*	30.2	*30.2*	28.5	28.5	*55.6*
5 June	*3 July*	17.8		25.8		24.1		*NR*
3 July	*7 August*	16.1		29.3		22.7		*NR*
7 August	*4 September*	16.6		27.4		20.5		*NR*
4 September	*2 October*	21.7		31.2		25.0		*NR*
2 October	*6 November*	27.7		32.4		28.7		*NR*
6 November	*4 December*	40.1	*40.1*	42.5	*42.5*	40.4	40.4	61.8
4 December	*8 January*	26.9	*26.9*	27.7	*27.7*	31.7	31.7	48.9
Average		*26.5*	*31.2*	*36.0*	*40.9*	*33.7*	*40.5*	*56.0*
Ratio annual mean/ period mean			*0.849*		*0.880*		*0.832*	
Average ratio (annualization factor)			*0.854*					
Annualization factor x D1 average			*47.8*					

Distance Adjustment

In line with LLAQM.TG(19)[1] distance correction has been applied to NO_2 monitoring sites that are not sited at locations of relevant exposure as detailed within Table B and C. The NO_2 Fall-Off with Distance Calculator (v4.2) has been used to predict the NO_2 concentration at a location of relevant exposure; the calculations are presented in Table T below, with the predicted concentrations also presented in Table D.

Table T- NO2 Fall-Off with Distance Calculations

Site ID	Distance (m)		Annual Mean Concentration (µg m-3)		
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor
HF4	2	8	28.9	60	**49.9**
HF5	1.2	3.7	32.7	53	**48.2**
HF01	1	6	25	36.7	32.5
HF02	1	6	27.6	49.2	**41.4**
HF03	1	6	22.9	76.9	**57.4**
HF05	2	7	22.9	48.8	**41.2**
HF06	1	6	23.7	46.8	38.5
HF07	1	4	23.7	59.6	**49.6**
HF09	1	6	25.6	35.5	31.9
HF11	5	5	32.7	69.1	**69.1**
HF12	1	6	24.5	32	29.3
HF13	3	24	32.7	35.8	34.1
HF14	1	4	28.2	53.8	**46.6**
HF15	1	6	27	32.2	30.3
HF16	1	6	29.4	51.2	**43.3**
HF17	1	6	25.6	36.1	32.3
HF18	1	6	25.6	38.6	33.9
HF19	1	6	25.6	49.7	**41**
HF21/22/23	2	8	30.8	58.1	**49.2**
HF24	1	6	32.7	55.6	**47.3**
HF27	1	4	25	39	35.1
HF28	1	4	24.5	40.5	36
HF29	4.7	7.7	26.5	53.9	**49.9**
HF31	3	8	27	59.6	**51.3**
HF33	1	4	27	37.3	34.4
HF35	1	6	30.8	44.2	39.4
HF36	1	4.7	30.8	51.8	**45.2**
HF37	1	6	20.3	50.8	39.8
HF39	1	6	32.7	60.5	**50.5**
HF40	1	6	32.7	50	**43.8**
HF41	1	12	32.7	49.2	**40.9**
HF42	11	20	32.7	47.4	**44**
HF43	3	12	32.7	49.2	**43.3**
HF44	3	14	32.7	46.8	**41.2**
HF45	3	13	32.7	43.5	39.4

Exceedances of the NO_2 annual mean AQO of 40 µg m^{-3} are shown in **bold**
NO_2 annual means in excess of 60 µg m^{-3}, indicating a potential exceedance of the NO_2 hourly mean AQS objective are shown in **bold** and **underlined**

To complete the NO_2 fall off with distance calculations a background value for each monitoring location is required. Background NO_2 concentrations for 2019 have been derived from the Defra Background Map database that has a current baseline of 2017.
Distance correction has been completed for all Roadside monitoring locations and not the Urban Background locations. Due to the limitations of the calculator distance correction could not be applied to Site HF25.

Appendix B Full Monthly Diffusion Tube Results for 2019

Table U. NO_2 Diffusion Tube Results

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO_2													
			Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
HF01	*83.3*	*83.3*	50.4	42.1	34.6	33.8	26.7	28.2	26.7	NR	NR	36.6	48.2	33.0	36	36.7
HF02	*100*	*100*	73.0	57.2	54.5	43.4	43.5	38.0	42.7	38.4	50.3	45.7	49.7	41.4	**48.2**	**49.2**
HF03	*100*	*100*	73.4	84.3	75.8	71.4	72.9	75.2	83.1	73.6	81.3	70.7	81.9	60.9	**75.4**	**76.9**
HF04	*100*	*100*	38.5	36.1	27.3	29.5	18.6	21.5	21.2	18.6	23.1	28.0	42.1	28.2	27.7	28.3
HF05	*58.3*	*58.3*	53.7	55.8	48.3	68.0	55.6	NR	NR	NR	NR	NR	61.8	48.9	**56 (47.8[A])**	**57.1 (48.8[A])**
HF06	*100*	*100*	51.1	47.8	50.3	47.9	45.0	39.7	42.3	32.4	43.3	46.6	62.7	41.9	**45.9**	**46.8**
HF07	*91.7*	*91.7*	67.8	63.9	57.6	62.0	59.1	53.5	57.8	44.8	58.9	NR	63.6	53.7	**58.4**	**59.6**
HF08	*100*	*100*	41.2	31.6	25.3	32.3	18.7	22.2	17.6	17.2	24.0	26.4	40.9	25.3	26.9	27.4
HF09	*91.7*	*91.7*	59.6	51.8	39.5	46.0	30.5	NR	30.4	29.1	34.8	43.0	56.9	34.8	34.8	35.5
HF10	*100*	*100*	43.6	39.4	30.8	33.4	21.7	25.6	20.4	21.1	27.1	31.4	37.6	36.6	30.7	31.3
HF11	*100*	*100*	79.9	76.1	71.5	75.6	68.2	58.0	62.2	56.1	61.5	63.3	84.2	56.3	**67.7**	**69.1**
HF12	*100*	*100*	44.2	39.6	29.2	35.7	26.2	27.1	21.7	20.2	26.1	31.7	44.1	30.8	31.4	32
HF13	*83.3*	83.3	58.3	48.8	C	39.0	28.6	25.1	23.8	18.8	NR	30.6	46.2	31.6	35.1	35.8
HF14	91.7	91.7	63.4	63.9	50.3	44.7	42.4	39.6	50.1	NR	55.3	56.5	59.7	53.9	**52.7**	**53.8**
HF15	100	100	43.9	37.0	32.5	39.3	28.7	25.9	8.9	22.3	27.7	27.0	41.8	30.3	30.4	32.2
HF16	91.7	91.7	57.3	60.7	45.3	51.0	44.6	NR	39.1	44.8	48.1	50.1	57.9	53.7	**50.2**	**51.2**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO_2													
			Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
HF17	*100*	*100*	48.7	43.2	30.7	36.0	29.5	30.3	25.4	26.5	31.7	36.6	47.9	38.0	35.4	36.1
HF18	*100*	*100*	49.6	47.6	37.0	43.1	31.8	31.4	32.8	32.8	34.1	32.7	43.8	36.7	37.8	38.6
HF19	*91.7*	*91.7*	61.1	60.1	47.2	43.1	43.5	45.1	46.5	46.1	40.2	I	55.7	47.2	**48.7**	**49.7**
HF20	*100*	*100*	39.4	57.9	28.4	33.0	21.8	23.9	19.9	20.6	26.1	32.4	41.8	34.4	31.6	**40.5**
HF21	*66.7*	*66.7*	NR	NR	56.9	50.3	60.4	53.6	NR	38.3	NR	58.3	56.7	NR	**53.5**	**54.6**
HF22	*91.7*	*91.7*	69.5	NR	61.0	65.0	52.2	59.9	60.7	54.0	54.8	64.4	58.9	56.0	**59.7**	**60.9**
HF23	*91.7*	*91.7*	64.3	NR	60.0	50.4	55.9	49.3	56.6	47.3	51.1	55.8	62.6	60.1	**64.3**	**65.6**
HF24	*100*	*100*	54.9	64.6	47.9	64.8	51.9	51.7	50.2	43.7	52.5	54.7	66.0	51.3	**54.5**	**55.6**
HF25	*91.7*	*91.7*	38.6	26.7	25.1	34.3	17.7	19.5	NR	16.6	19.2	24.6	38.8	27.4	26.2	26.7
HF26	*100*	*100*	5.7	41.5	28.0	31.2	11.7	22.2	19.4	22.5	25.2	28.6	43.3	32.2	31.8	32.4
HF27	*91.7*	*91.7*	50.2	47.8	38.1	42.1	31.1	33.1	29.4	34.7	34.3	38.9	I	40.7	38.2	39
HF28	*100*	*100*	44.5	50.7	34.7	48.0	31.9	34.8	31.7	29.6	39.1	43.2	48.6	39.5	39.7	**40.5**
HF29	*83.3*	*83.3*	56.1	59.5	49.5	52.9	NR	46.2	54.7	55.2	49.5	53.8	NR	50.3	**52.8**	**53.9**
HF30	*100*	*100*	49.5	41.5	33.9	36.3	26.9	26.4	21.7	23.3	28.9	35.4	40.8	38.4	33.6	34.3
HF31	*100*	*100*	77.0	66.7	57.7	77.7	59.0	53.3	57.6	41.8	48.6	49.3	64.6	47.5	**58.4**	**59.6**
HF32	*100*	*100*	40.8	46.5	35.0	36.0	26.0	27.9	27.9	35.0	30.4	36.1	43.1	39.9	36	36.7
HF33	*100*	*100*	49.9	41.2	37.9	38.8	31.9	30.4	28.3	31.6	32.9	36.5	41.1	38.8	36.6	37.3
HF34	*100*	*100*	39.6	38.2	27.1	29.2	16.8	20.1	16.5	18.4	23.6	29.6	41.3	30.5	27.6	28.2
HF35	*100*	*100*	47.9	48.0	39.5	51.5	35.9	43.3	43.4	30.4	43.6	37.4	59.6	38.8	**43.3**	**44.2**

Site ID	Valid data capture for monitoring period % [a]	Valid data capture 2019 % [b]	Annual Mean NO_2													
			Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data [c]	Annual mean – bias adjusted [c]
HF36	*83.3*	*83.3*	62.5	51.7	46.0	63.6	55.4	57.3	54.6	37.1	47.4	NR	NR	32.2	**50.8**	**51.8**
HF37	*100*	*100*	50.3	61.7	44.9	54.0	44.4	45.6	42.3	43.2	46.1	55.8	59.1	50.7	**49.8**	**50.8**
HF38	*91.7*	*91.7*	37.6	40.9	26.1	31.2	23.6	23.9	19.2	19.6	NR	29.9	43.0	31.5	29.7	30.3
HF39	*100*	*100*	72.3	70.6	51.1	82.0	63.0	60.2	55.8	37.8	53.4	55.6	62.8	46.7	**59.3**	**60.5**
HF40	*100*	*100*	58.2	60.5	53.4	54.6	45.7	40.2	40.8	32.4	50.0	45.1	56.6	50.8	**49**	**50**
HF41	*100*	*100*	57.0	62.4	52.7	51.9	44.4	42.9	38.3	36.5	45.2	48.5	54.5	43.6	**48.2**	**49.2**
HF42	*100*	*100*	58.2	59.3	50.1	50.4	40.7	38.5	35.2	32.0	45.1	47.1	52.9	47.9	**46.5**	**47.4**
HF43	*100*	*100*	56.3	60.3	53.3	50.8	43.9	40.8	36.2	33.3	46.5	49.3	59.2	48.1	**48.2**	**49.2**
HF44	*91.7*	*91.7*	58.4	60.8	45.5	48.3	42.8	39.4	38.6	36.4	43.5	44.9	I	46.3	**45.9**	**46.8**
HF45	*83.3*	*83.3*	48.8	NR	42.8	45.8	35.2	33.0	36.8	I	42.2	47.1	49.0	45.3	**42.6**	**43.5**
HF 21/22/23	*80.6*	*80.6*	66.9	NR	59.3	55.2	56.2	54.3	58.7	46.5	53.0	59.5	59.4	58.1	**57**	**58.1**

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

[a] Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

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

[c] Means should be "annualised" in accordance with LLAQM Technical Guidance, if valid data capture is less than 75%

NR= No result

C= Affected by water present in tube

I=Insect in tube so result removed

[A]= Annualised result

Triplicate Tube