

London Borough of Havering

Air Quality Annual Status Report for 2020

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This report provides a detailed overview of air quality in London Borough of Havering during 2020. It has been produced to meet the requirements of the London Local Air Quality Management (LLAQM) statutory process<sup>1</sup>.

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<sup>1</sup> LLAQM Policy and Technical Guidance 2019 (LLAQM.TG(19))

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## Abbreviations

<b>Abbreviation</b>	<b>Description</b>
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
AQO	Air Quality Objective
BEB	Buildings Emission Benchmark
CAB	Cleaner Air Borough
EV	Electric Vehicle
GLA	Greater London Authority
LAEI	London Atmospheric Emissions Inventory
LAQM	Local Air Quality Management
LLAQM	London Local Air Quality Management
NRMM	Non-Road Mobile Machinery
PM <sub>10</sub>	Particulate matter less than 10 micron in diameter
PM <sub>2.5</sub>	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**

<b>Pollutant</b>	<b>Standard / Objective (UK)</b>	<b>Averaging Period</b>	<b>Date<sup>(1)</sup></b>
Nitrogen dioxide (NO <sub>2</sub> )	200 µg m <sup>-3</sup> not to be exceeded more than 18 times a year	1-hour mean	31 Dec 2005
Nitrogen dioxide (NO <sub>2</sub> )	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2005
Particles (PM <sub>10</sub> )	50 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	24-hour mean	31 Dec 2004
Particles (PM <sub>10</sub> )	40 µg m <sup>-3</sup>	Annual mean	31 Dec 2004
Particles (PM <sub>2.5</sub> )	25 µg m <sup>-3</sup>	Annual mean	2020
Particles (PM <sub>2.5</sub> )	Target of 15% reduction in concentration at urban background locations	3-year mean	Between 2010 and 2020
Sulphur dioxide (SO <sub>2</sub> )	266 µg m <sup>-3</sup> not to be exceeded more than 35 times a year	15-minute mean	31 Dec 2005
Sulphur dioxide (SO <sub>2</sub> )	350 µg m <sup>-3</sup> not to be exceeded more than 24 times a year	1-hour mean	31 Dec 2004
Sulphur dioxide (SO <sub>2</sub> )	125 µg m <sup>-3</sup> not to be exceeded more than 3 times a year	24-hour mean	31 Dec 2004

**Notes:**

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

# 1. Air Quality Monitoring

## 1.1 Locations

**Table B. Details of Automatic Monitoring Sites for 2020**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Monitoring technique
HV1	Rainham	553127	182506	Roadside	Y (LB Havering)	3	10	3	NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub>	Chemiluminescent; TEOM, FDMS
HV3	Romford	551108	188257	Roadside	Y (LB Havering)	3	8	3	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescent; FDMS

**Table C. Details of Non-Automatic Monitoring Sites for 2020**

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
HAV2, HAV5, HAV6	Mercury Gardens	551488	188993	Urban Centre	Y (LB Havering)	1	3	2	NO <sub>2</sub>	N
HAV1, HAV7, HAV8	Waterloo Road	551108	188257	Urban Centre	Y (LB Havering)	3	8	2	NO <sub>2</sub>	Y
HAV3	Nelson Road	551726	183462	Urban Background	Y (LB Havering)	3	1	2	NO <sub>2</sub>	N
HAV4	Langtons	553724	187560	Urban Background	Y (LB Havering)	1	N/A	2	NO <sub>2</sub>	N
HAV9, HAV10, HAV11	Alexandra Road	551629	188296	Urban Centre	Y (LB Havering)	3	1	2	NO <sub>2</sub>	N
HAV12	Main Road GPPS	552096	189619	Roadside	Y (LB Havering)	4	1	2	NO <sub>2</sub>	N
HAV13, HAV14, HAV15	A12 Junction with North Street	550607	189685	Roadside	Y (LB Havering)	5	5	2	NO <sub>2</sub>	N
HAV16, HAV17, HAV18	Rom Valley Way	551414	187802	Roadside	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N
HAV19, HAV20, HAV21	Collier Row	549837	191109	Kerbside	Y (LB Havering)	3	0.5	2	NO <sub>2</sub>	N
HAV22, HAV23, HAV24	Ravensbourne School	553707	190817	Urban Background	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N



Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
HAV25	Wincanton Road	553727	193161	Urban Background	Y (LB Havering)	1	3	2	NO <sub>2</sub>	N
HAV26	Adj. 109 Cross Road	549532	189777	Urban Background	Y (LB Havering)	3	1	2	NO <sub>2</sub>	N
HAV27, HAV28, HAV29	Rush Green Road	550942	187420	Kerbside	Y (LB Havering)	5	0.5	2	NO <sub>2</sub>	N
HAV30	Marlborough Road	549318	189384	Urban Background	Y (LB Havering)	3	1	2	NO <sub>2</sub>	N
HAV31	Danes Road	550197	187908	Industrial	Y (LB Havering)	4	1	2	NO <sub>2</sub>	N
HAV32, HAV33, HAV34	Gallows Corner	553410	190558	Kerbside	Y (LB Havering)	4	0.5	2	NO <sub>2</sub>	N
HAV35	Church Road	554204	193795	Urban Background	Y (LB Havering)	3	1	2	NO <sub>2</sub>	N
HAV36	Bedford Park Entrance	551755	193022	Rural	Y (LB Havering)	1	N/A	2	NO <sub>2</sub>	N
HAV37	Colchester Road	555723	191750	Kerbside	Y (LB Havering)	3	0.5	2	NO <sub>2</sub>	N
HAV 38	Myrtle Road	553434	191656	Roadside	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N
HAV39	Rise Park Boulevard	551616	190622	Roadside	Y (LB Havering)	3	1	2	NO <sub>2</sub>	N
HAV40	Main Road	553174	190306	Roadside	Y (LB Havering)	9	1	2	NO <sub>2</sub>	N
HAV41	Main Road	552517	189826	Roadside	Y (LB Havering)	8	1	2	NO <sub>2</sub>	N
HAV42	Mawney School	550623	188890	Kerbside	Y	2	1	2	NO <sub>2</sub>	N

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
					(LB Havering)					
HAV43	Upminster School	556072	186539	Roadside	Y (LB Havering)	2	2	2	NO <sub>2</sub>	N
HAV44	Ardleigh Green School	553952	189731	Kerbside	Y (LB Havering)	5	1	2	NO <sub>2</sub>	N
HAV45	St. Marys School RC	552327	187422	Kerbside	Y (LB Havering)	10	1	2	NO <sub>2</sub>	N
HAV46	Rainham Village School	552441	182337	Kerbside	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N
HAV47	Campion School off A127	554730	189487	Roadside	Y (LB Havering)	7	2	2	NO <sub>2</sub>	N
HAV48	Parkland School	550602	189990	Urban Background	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N
HAV49	Newton's School	550722	183294	Roadside	Y (LB Havering)	2	1	2	NO <sub>2</sub>	N
HAV50	Blewitts Cottages	551526	182672	Kerbside	Y (LB Havering)	12	0.5	2	NO <sub>2</sub>	N
HAV51	St. Edwards School	551180	189432	Urban Background	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N
HAV52	Opp. Harold Wood Stn.	554741	190626	Roadside	Y (LB Havering)	0	2	2	NO <sub>2</sub>	N
HAV53	R.J. Mitchell School	552841	184966	Roadside	Y (LB Havering)	15	2	2	NO <sub>2</sub>	N
HAV54	Hilldene Infant School	553135	191674	Roadside	Y (LB Havering)	5	1	2	NO <sub>2</sub>	N
HAV55	Butts Green Road	553830	188314	Kerbside	Y (LB Havering)	1	0.5	2	NO <sub>2</sub>	N
HAV56	Rainham Broadway	552045	182222	Kerbside	Y (LB Havering)	1	0.5	2	NO <sub>2</sub>	N

Site ID	Site Name	X (m)	Y (m)	Site Type	In AQMA? If so, which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (N/A if not applicable) (m)	Inlet height (m)	Pollutants monitored	Tube co-located with an automatic monitor. (Y/N)
HAV57	Romford Taxi Rank	551420	188526	Urban Centre	Y (LB Havering)	1	0.2	2	NO <sub>2</sub>	N
HAV58, HAV59, HAV60	Romford Battis	551397	188509	Urban Centre	Y (LB Havering)	1	0.2	2	NO <sub>2</sub>	N
HAV61	Wennington Road	553719	180987	Urban Background	Y (LB Havering)	1	1	2	NO <sub>2</sub>	N
HAV62	New Road Junction with South Street	550462	183013	Kerbside	Y (LB Havering)	10	0.5	2	NO <sub>2</sub>	N
HAV63	New Road Junction with Spencer Road	550888	182884	Kerbside	Y (LB Havering)	10	0.5	2	NO <sub>2</sub>	N
HAV64	New Road Junction with Betterton Road	551112	182811	Kerbside	Y (LB Havering)	10	0.5	2	NO <sub>2</sub>	N
HAV65	Front Lane/Jnct Brunswick Ave LP40	557323	187932	Urban Centre	Y (LB Havering)	1	0.2	2	NO <sub>2</sub>	N
HAV66	Station Lane LP6	554013	187001	Urban Centre	Y (LB Havering)	1	0.5	2	NO <sub>2</sub>	N

The locations of the above sites are shown on maps in Appendix C.

## 1.2 Comparison of Monitoring Results with AQOs

The results presented are after adjustments for “annualisation” and for distance to a location of relevant public exposure (if required), the details of which are described in Appendix A.

**Table D. Annual Mean NO<sub>2</sub> Ratified and Bias-adjusted Monitoring Results**

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HV1	Automatic	-	99	35.3	32	34	34.3	30	29.1	23
HV3	Automatic	-	98	<b>57.5</b>	35	38	<b>40</b>	38	35.8	29
HAV 2, 5, 6	Diffusion tube	-	75	<b>54.0</b>	<b>51.7</b>	<b>55.9</b>	<b>51.1</b>	<b>47.9</b>	<b>42</b>	38.2
HAV 1, 7, 8	Diffusion tube	-	75	<b>40.6</b>	39.0	<b>40.7</b>	<b>40.3</b>	39.6	36.7	38.6
HAV 3	Diffusion tube	-	75	32.9	28.3	29	31.7	26.5	26	25.1
HAV 4	Diffusion tube	-	75	24.5	20.1	26	20.1	17.3	19.7	16.7
HAV 9, 10, 11	Diffusion tube	-	75	33.3	30.7	33.1	29.6	29	26.1	26.7
HAV 12	Diffusion tube	-	75	36.8	37.4	<b>43</b>	<b>41.6</b>	36.6	32.4	28.3
HAV 13, 14, 15	Diffusion tube	-	75	39.1	39.4	<b>41.7</b>	<b>40.5</b>	38.7	35.4	32.2
HAV 16, 17, 18	Diffusion tube	-	75	34.2	34.7	36.5	39.8	34.8	33.6	29.1
HAV 19, 20, 21	Diffusion tube	-	75	<b>45.6</b>	<b>44.8</b>	<b>44.8</b>	<b>49.2</b>	<b>40.4</b>	37.2	35.7
HAV 22, 23, 24	Diffusion tube	-	75	25.8	26.6	28.3	30.4	25.3	24.5	16.6
HAV 25	Diffusion tube	-	75	23.3	22.9	24.7	26.6	22.1	20.8	19.7
HAV 26	Diffusion tube	-	75	21.1	22.7	23.8	27.3	21.4	21.3	19.5

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HAV 27, 28, 29	Diffusion tube	-	75	<b>47.8</b>	<b>47.6</b>	<b>52.3</b>	<b>54.1</b>	<b>51.4</b>	<b>47.3</b>	<b>44.4</b>
HAV 30	Diffusion tube	-	75	21.8	24.8	24	29.1	21.6	21.9	21.3
HAV 31	Diffusion tube	-	75	26.1	27.1	29.1	30.6	26.4	25.2	22
HAV 32, 33, 34	Diffusion tube	-	75	<b>51.6</b>	<b>55.0</b>	<b>53.2</b>	<b>52.9</b>	<b>50.3</b>	<b>49.4</b>	<b>45.2</b>
HAV 35	Diffusion tube	-	75	23.4	24.2	27.7	27.2	26.2	23	19.8
HAV 36	Diffusion tube	-	58	15.7	21.1	21.8	23.9	18.3	18.9	20.9
HAV 37	Diffusion tube	-	75	<b>49.8</b>	<b>48.2</b>	<b>55.3</b>	<b>55.3</b>	<b>48.0</b>	<b>41.6</b>	34.5
HAV 38	Diffusion tube	-	75	22.2	21.5	24.8	25.3	22.2	21	20.5
HAV 39	Diffusion tube	-	75	31.1	33.3	31.3	38.8	29.0	28.9	30.9
HAV 40	Diffusion tube	-	67	<b>48.1</b>	<b>49.5</b>	<b>45.1</b>	<b>52.1</b>	<b>49.2</b>	<b>44.4</b>	36.8
HAV 41	Diffusion tube	-	75	<b>43.0</b>	<b>45.0</b>	<b>46.2</b>	<b>49.6</b>	<b>40.9</b>	39.3	32.2
HAV 42	Diffusion tube	-	75	32.3	31.4	31.7	31.6	30.8	29.7	26.5
HAV 43	Diffusion tube	-	75	35.0	38.2	35.9	35.6	32.2	34.3	27.2
HAV 44	Diffusion tube	-	75	37.7	37.1	37.9	36.7	34.4	31.6	30.1
HAV 45	Diffusion tube	-	75	37.2	35.7	<b>40.7</b>	37.7	35.6	31.8	26.5
HAV 46	Diffusion tube	-	75	32.9	31.3	34.5	33	32.2	30	27.8
HAV 47	Diffusion tube	-	75	<b>48.5</b>	<b>42.0</b>	<b>46.5</b>	<b>42.3</b>	36.8	<b>41</b>	35.6

Site ID	Site type	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HAV 48	Diffusion tube	-	58	27.3	28.4	30.7	37.8	25	26.4	21.4
HAV 49	Diffusion tube	-	58	29.1	26.8	27.9	28	34.3	26.6	23.6
HAV 50	Diffusion tube	-	67	38.3	<b>41.1</b>	<b>42.2</b>	<b>46.1</b>	39.8	36.6	32.5
HAV 51	Diffusion tube	-	75	26.5	24.3	24.1	24.9	23.4	21.6	20.7
HAV 52	Diffusion tube	-	42	37.5	34.3	37.3	<b>47.8</b>	<b>41.1</b>	32.2	26.1
HAV 53	Diffusion tube	-	58	-	-	-	-	-	-	29.1
HAV 54	Diffusion tube	-	58	-	-	-	-	-	-	21.4
HAV 55	Diffusion tube	-	67	-	-	-	-	-	-	35.9
HAV 56	Diffusion tube	-	75	-	-	-	-	-	-	35.7
HAV 57	Diffusion tube	-	75	<b><u>63.1</u></b>	<b>59.0</b>	<b><u>62.9</u></b>	<b><u>61</u></b>	<b><u>64.7</u></b>	<b>53.1</b>	<b>52.9</b>
HAV 58, 59, 60	Diffusion tube	-	75	<b><u>84.7</u></b>	<b><u>75.2</u></b>	<b><u>69.1</u></b>	<b><u>71.7</u></b>	<b><u>71.4</u></b>	<b><u>71.3</u></b>	<b><u>66.9</u></b>
HAV 61	Diffusion tube	-	75	-	-	-	-	27.5	26.2	22.8
HAV62	Diffusion tube	-	75	-	-	-	-	-	-	34.1
HAV63	Diffusion tube	-	58	-	-	-	-	-	-	30.5
HAV64	Diffusion tube	-	67	-	-	-	-	-	-	30.9
HAV65	Diffusion tube	-	75	-	-	-	-	-	-	28.8
HAV66	Diffusion tube	-	75	-	-	-	-	-	-	34.6

## Notes:

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

Exceedances of the  $\text{NO}_2$  annual mean AQO of  $40 \mu\text{g m}^{-3}$  are shown in **bold**.

$\text{NO}_2$  annual means in excess of  $60 \mu\text{g m}^{-3}$ , indicating a potential exceedance of the  $\text{NO}_2$  hourly mean AQS objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 33%.

Results have been distance corrected where applicable.

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

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

## Summary

As part of the expansion of Havering’s air quality monitoring network under the AQAP, six new diffusion tube monitoring sites have been added (HAV53, HAV54, HAV55, HAV56, HAV65, HAV66). For the selection of the monitoring locations a number of factors were taken into account, such as network gaps in certain areas of the borough, sensitivity of receptors (e.g. schools), potential hotspots shown on modelled pollution maps and responses received during the consultation on the AQAP. Furthermore, three diffusion tubes (HAV62, HAV63, HAV64) have been added for baseline monitoring, as part of Havering’s Beam Parkway regeneration scheme.

Having reviewed the  $\text{NO}_2$  annual means for the past seven years (2014 - 2020), the following observations have been made:

- For the vast majority of the sites (33 of the 39)  $\text{NO}_2$  concentrations have been consistently decreasing since 2017.
- For 17 sites the decrease was greater than 10% relative to 2019.
- The number of sites exceeding the annual mean objective has been reducing. In 2020 only four sites exceeded the objective, comparing to sixteen in 2017.
- Three sites (HAV2,5,6, HAV37 and HAV40) met the legal limit for the first time since 2014.

**Table E. NO<sub>2</sub> Automatic Monitoring Results: Comparison with 1-hour Mean Objective, Number of 1-Hour Means > 200 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HV1	-	99	0	0	0	0	0	0	0
HV3	-	98	0	0	0	1	0	0	0

**Notes**

Results are presented as the number of 1-hour periods where concentrations greater than 200 µg m<sup>-3</sup> have been recorded.

Exceedance of the NO<sub>2</sub> short term AQO of 200 µg m<sup>-3</sup> over the permitted 18 hours per year are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

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

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

**Summary**

The hourly mean objective of 200 µg m<sup>-3</sup> was exceeded only once at the HV3 monitoring site in 2017, which is significantly less than the permitted 18 days per year. No exceedances have been identified at the HV1 monitoring site.



**Table F. Annual Mean PM<sub>10</sub> Automatic Monitoring Results (µg m<sup>-3</sup>)**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HV1	-	99	19	18	19	18	17	17.4	15
HV3	-	91	25	24	15	19	20	20.5	21

**Notes**

The annual mean concentrations are presented as µg m<sup>-3</sup>.

Exceedances of the PM<sub>10</sub> annual mean AQO of 40 µg m<sup>-3</sup> are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 33%.

(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%).

**Summary**

No significant trend (positive or negative) in PM<sub>10</sub> levels has been identified at both sites over the 7-year period. PM<sub>10</sub> levels are well below the annual mean objective of 40 µg m<sup>-3</sup>.

**Table G. PM<sub>10</sub> Automatic Monitoring Results: Comparison with 24-Hour Mean Objective, Number of PM<sub>10</sub> 24-Hour Means > 50 µg m<sup>-3</sup>**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HV1	-	99	3	3	6	4	1	4	1
HV3	-	91	11	9	5	N/A <sup>d</sup>	2	9	5

**Notes**

Exceedances of the PM<sub>10</sub> 24-hour mean objective (50 µg m<sup>-3</sup> over the permitted 35 days per year) are shown in **bold**.

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

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

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

**Summary**

Exceedances of the 24-hour mean at both sites remain to be significantly less than the annual objective of 35 exceedances.

**Table H. Annual Mean PM<sub>2.5</sub> Automatic Monitoring Results ( $\mu\text{g m}^{-3}$ )**

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	2014	2015	2016	2017	2018	2019	2020
HV1	-	99	12	11	12	12	11	11.1	9

**Notes**

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

Exceedances of the PM<sub>2.5</sub> annual mean AQO of  $25 \mu\text{g m}^{-3}$  are shown in **bold**.

All means have been “annualised” in accordance with LLAQM Technical Guidance, if valid data capture is less than 75% and more than 33%.

(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%).

**Summary**

Annual Mean PM<sub>2.5</sub> concentrations remain at a steady level over the 7-year period and well below the annual mean AQO of  $25 \mu\text{g m}^{-3}$ .

## 2. Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on air quality at local, regional and national scales and presented various challenges for Havering with respect to undertaking its LAQM duties during 2020. Taking into account Table 1-Impact Matrix included in the COVID-19 Supplementary Guidance provided by Defra, the key impacts and challenges of COVID-19 are summarised in Table I below.

**Table I. Summary of COVID-19 impacts**

Parameter	Summary	Overall Impact
Automatic monitoring: data capture (%)	Both automatic monitoring sites had more than 75% data capture.	None
Automatic monitoring: QA/QC Regime	Due to the COVID-19 restrictions there was a 4-month break in routine calibrations at the HV3 site, however the response of the analyser was stable during this period and there was no discernible impact on the measurements. All other requirements of the LAQM.TG(16) (e.g. audits, service and maintenance etc.) were adhered to.	Small
Passive monitoring: data capture (%)	Due to the COVID-19 restrictions diffusion tubes were exposed for three months (March-June 2020). It was decided not to use this data, as the exposure period was significantly longer than the 4-5 week recommended, the data capture for all diffusion tubes was therefore reduced to 75%.  Where data capture was less than 75%, the causes were other than the COVID-19 restrictions (missing diffusion tubes due to e.g. weather, birds, theft etc.).	Small
Passive monitoring: bias adjustment factor	The number of co-location studies for the specific laboratory and preparation method was not reduced in 2020.	None
Passive monitoring: adherence to changeover dates	Due to the COVID-19 lockdown which started in March 2020, tubes were left unchanged for three exposure periods to adhere to government lockdown restrictions until June 2020.	Medium

Parameter	Summary	Overall Impact
Passive monitoring: storage of tubes	Tubes were stored in accordance with laboratory guidance and analysed promptly.	None
AQAP: measure implementation	Due to the COVID-19 lockdown certain actions could not be progressed, such as for example anti-idling events, as part of the Idling Action Project. COVID-19 had also an impact on the LIP funding, which supports a number of AQAP actions (e.g. schemes of the Local Implementation Plan, cycle training, awareness raising, tree planting etc.)	Medium
AQAP: new AQAP development	Havering's AQAP covers the period 2018-2023, as such, it was not planned to develop a new AQAP in 2020	None

### 3. Action to Improve Air Quality

#### 3.1 Air Quality Action Plan Progress

Table J provides a brief summary of London Borough of Havering progress against the Air Quality Action Plan, showing progress made this year. New projects which commenced in 2020 are shown at the bottom of the table.

**Table J. Delivery of Air Quality Action Plan Measures**

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data</li> <li>• Benefits</li> <li>• Negative impacts / Complaints</li> </ul>
1.1	Monitoring and other core statutory duties	Undertake detailed computer modelling of air quality in Havering.	<i>Action completed</i> , as reported in 2020.
1.2	Monitoring and other core statutory duties	Use AQ Mesh Pods to provide real time air quality measurements for schools to use as part of air quality publicity campaigns and to encourage walking to school.	<p>Action ongoing. AQ Mesh pods are used to support local projects (e.g. School Streets), as well as when dealing with complaints / requests. Due to the COVID-19 restrictions, the pods were not required in 2020.</p> <p>Although it is recognised that the accuracy of the AQMesh pods readings is not as high as other monitoring equipment, which has been officially approved by DEFRA, the use of the AQMesh pods gives a picture of air quality and has been found useful for keeping the public up to date on local air quality and raise awareness and knowledge. Also getting continuous readings allows us to correlate NO2 levels with potential causes (e.g. higher NO2 levels at pick up/drop of times on the school run) and identify areas of poor air quality outside of schools that were previously unknown.</p>
1.3	Monitoring and other core statutory duties	Undertake feasibility study into the location and start-up of a new	<i>Action completed</i> . Taking into account the high operational costs of a permanent monitoring station, associated with data management, service and maintenance, electricity and telecommunications, it was

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
		permanent continuous monitoring location.	decided that it is not feasible to maintain the operation of the station longer term.
1.4	Monitoring and other core statutory duties	Expand the current Diffusion Tube Network.	<i>Action completed</i> , as reported in 2020
1.5	Monitoring and other core statutory duties	Model likely air quality impact of planned major strategic schemes.	<i>Action ongoing</i> . All major strategic developments required to do air quality modelling (part of a detailed Air Quality Assessment at the planning application stage).
2.1	Public health and awareness raising	Promote walking and cycling. Engage with over 50's forum to form a walking club and organised led rides	<i>Action ongoing</i> . The over 50's programme is run by trained volunteers with support from the Council's Sports Development Service. In 2020, face to face sessions and events went online and were held on Zoom due to the Coronavirus pandemic. Walking for Health walks resumed for a brief period of time in October before being postponed because of the outbreaks and lockdowns. Havering actively promoted events such as Bike to School Week, Walk to School Week or Clean Air Day.
2.2	Public health and awareness raising	Continue to use Miles the Mole as an air quality champion and educational prop.	<p><i>Action ongoing</i>. Miles the Mole continues visiting schools as part of the Council's Air Quality Campaign. Active travel and air quality themed Theatre in Education production is an interactive programme aimed at year 6 pupils.</p> <p>In 2020 Havering provided online and virtual sessions to schools, in a two weeks period between the 3rd and the 13th of November. Twenty schools participated the sessions, which is the total capacity, the format of the programme allowed up to three schools a day.</p> <p>The campaign increases awareness and knowledge of children/staff/parents around air quality and promotes small changes people can make to reduce their contribution to air pollution and reduce their exposure to poor air quality.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
2.3	Public health and awareness raising	Support Transport for London led initiative to commission a cross borough bus rapid transit study which would include looking at options for improving access to the London Riverside BID.	<i>Action on hold.</i> No progress was made in 2020 due to financial constraints. The continuation of the project will depend on the ability of TfL to support it.
2.4	Public health and awareness raising	Public Health input into delivery of AQAP.	<i>Action ongoing.</i> The Public Health Service supports the Council to achieve its aims to improve air quality. This has included (a) contributing to the evidence base for the local strategy, and (b) the Director of Public Health chairing the Air Quality Board. Board meetings were suspended in 2020 due to Covid-19.
2.5	Public health and awareness raising	Continue to promote the TfL STARS (Sustainable Travel: Active, Responsible, Safe) accredited travel planning programme with schools to reduce car use on school run.	<i>Action ongoing.</i> All schools in Havering are encouraged to maintain active School Travel Plans (STP) and report their activities annually via the Transport for London STARS Accreditation Programme website. In 2020 47 schools out of 88 were recognised within the STARS accreditation scheme. Out of them, 37 have been awarded gold recognition. Our schools hold sixteen School of Excellence Awards. The promotion of STARS is continuous however this reduced in 2020 due to the impacts of Covid-19. It is expected to resume fully through 2021. Havering also offers support in the form of funding, guidance together with suggested activities and initiatives including cycle training, theatre in education and curriculum materials to promote active, healthy, safe and sustainable travel to/from school as an alternative to using the car.
2.6	Public health and awareness raising	Promote Smarter Travel initiatives with businesses and encourage local business to adopt workplace travel plans.	<i>Action partly on hold.</i> Havering is a large borough where workers not only travel here within the borough they also come from boroughs and Essex districts therefore we have been proactive in promoting sustainable travel and workplace travel plans to large employers.



Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			<p>While the Council is continuously promoting Smarter Travel initiatives to businesses via monthly bulletins, business forums and networking events were not held due to Covid-19. Business packs continued to be provided and are available online.</p> <p>Havering has ongoing cooperation with the Borough's largest employers such as Queen's Hospital, Sapphire Leisure Centre, the Centre for Engineering and Manufacturing Excellence, and the North-East London NHS Foundation Trust. Because of staffing levels, we focus on large employers and developments over 2500m<sup>2</sup> as they are likely to have the greatest impact in the Borough in terms of transport generation.</p>
2.7	Public health and awareness raising	Continue to promote airTEXT to make sure vulnerable residents are aware of the tool and how to use it.	<p><i>Action ongoing.</i> Havering has signed up to provide information via SMS on air pollution episodes through the AirTEXT software. We promote AirTEXT through the Council's social media platforms a few times per year, particularly in winter, as well as on Havering's website. Also Havering's Communication team puts out alerts on social media when we get notified of pollution episodes by Imperial College.</p>
2.8	Public health and awareness raising	Investigate the feasibility of introducing Car Clubs and associated facilities in Havering.	<p><i>Action on hold.</i> Havering is not taking forward the plan for a Council run Car Club programme, as it has not been considered a priority right now. There are currently a few car clubs operating around new developments, sourced by the developers.</p>
2.9	Public health and awareness raising	Support the LIP cycle training budget to promote "bike ability" in schools and also to adults and families.	<p><i>Action ongoing.</i> In 2020 little progress was made due to the COVID-19 restrictions. Bikeability training for adults and schoolchildren resumed in Autumn 2020, but then it stopped again when the lockdown was announced. During this brief period, 15 schools participated in the programme which was funded by the DfT, with Dr. Bike bicycle maintenance sessions also having been offered as part of it.</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
2.10	Public health and awareness raising	Encourage greater use of the Council's staff travelling to work sustainably through adequate provision of cycle infrastructure at Council buildings.	<i>Action completed</i> , as reported in 2020. A review of this action will be taken due to the significant impact on ways of working for staff following Covid-19 pandemic.
2.11	Public health and awareness raising	Successful delivery of annual Local Implementation Plan (LIP) programme to deliver schemes that support the Healthy Streets agenda and provide options for people to travel sustainably.	<i>Action ongoing</i> . Healthy Streets Officer seconded from Sustrans to deliver Mayor's Healthy Streets agenda in Havering. This has included working with two primary schools in the borough to develop Walking Zone maps encouraging pupils to travel to school actively. A further Walking Map will be delivered in the Autumn of 2021 as well as work with two secondary schools to develop initiatives to encourage pupils to travel to school sustainably.
2.12	Public health and awareness raising	Offer workplace grants to businesses for infrastructure (e.g. cycle parking, lockers and showering facilities)	<i>Action on hold</i> . Active travel grants were put on hold because of the limited LIP funding from TfL. The continuation of the scheme will depend on financial resources available.
3.1	Emissions from developments and buildings	Creation of an Air Quality Supplementary Planning Guidance (SPG).	<i>Action partly on hold</i> . A Draft SPG has been created, but it can be progressed until Havering's Local Plan has been adopted.
3.2	Emissions from developments and buildings	Review current planning conditions, in relation to air quality, to ensure they are fit for purpose.	<i>Action completed</i> . Planning conditions have been reviewed and are in line with the requirements set out in the London Plan and the relevant SPGs.
3.3	Emissions from developments and buildings	Adopt and implement planning controls on combined heat and power (CHP) or biomass systems	<i>Action completed</i> . Havering uses a condition requiring the emissions limits for CHP and Biomass set out in Appendix 7 of the GLA Sustainable Design and Construction SPG. For all new developments Havering requires ultra low NOx boilers to be installed.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
3.4	Emissions from developments and buildings	Adopt and implement planning controls on air quality neutral development.	<i>Action ongoing.</i> Havering requires all new major developments to undertake an air quality neutral assessment. In light of the New London Plan, Havering will require an air quality neutral for all new developments.
3.5	Emissions from developments and buildings	To ensure that new Housing Estate Regeneration Programme for LBH housing developments obtain the commitment from developers to a strategy of future reduction of reduced carbon foot print and minimal impact on air quality.	<i>Action ongoing.</i> Havering's regeneration team is committed to reduced carbon foot print and air quality neutral development. Public Protection, Regeneration Services and the appointed consultants and contractors collaborate and are aware that an air quality assessment is required on validation of any regeneration planning applications.
3.6	Emissions from developments and buildings	Adopt and implement planning controls for innovative and recognised green space and planting in new developments. Planning to work with grounds maintenance and parks at design stage for advice on greening and planting	<i>Action ongoing,</i> through inter-departmental work with Havering's Planning and Grounds Maintenance Services.
3.7	Emissions from developments and buildings	Promote and enforce the Smoke Control Areas to reduce the amount of unlicensed burning.	<p><i>Action ongoing.</i> Havering provides information to residents about Smoke Control Areas on its website <a href="https://www.havering.gov.uk/airquality">https://www.havering.gov.uk/airquality</a></p> <p>Chimney smoke complaints are investigated to determine if authorised fuels are being used by the resident. If non-authorised fuels are being used, our enforcement officers educate the residents and for a first time complaint, provide details from the DEFRA</p>

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
			website. If further complaints are made and substantiated, then enforcement action is taken.
3.8	Emissions from developments and buildings	Monitoring and implementation of Non Road Mobile Machinery (NRMM)	<i>Action ongoing.</i> A planning condition with the NRMM requirements is applied to all major developments in Havering. As part of the London-wide NRMM scheme, 26 audits were undertaken in 2020. All sites were compliant (27% self-compliant, 73% compliant following engagement with inspectors).
3.9	Emissions from developments and buildings	Promote public sector landlords (homes and public buildings) to take air quality and energy efficiency advice before refits, via the GLA RE:NEW and RE:FIT Programmes.	<i>Action ongoing.</i> The RE:NEW programme has been closed and Havering is not currently using the RE:FIT programme, due to lack of remits. However, there is ongoing work towards a new energy strategy that would cover our stock of approximately 12,000 properties.
3.10	Emissions from developments and buildings	Deliver infrastructure to ensure that Romford, Rainham and Beam Park Housing Zones are accessible by means other than the car and that residents are provided with options to travel sustainably (Including the Beam Parkway Major scheme and Beam Park station)	<p><i>Action ongoing.</i> The Beam Park is to be converted the A1306 into a residential scale street with a 2km long bi-directional cycleway on the southern side, together with green infrastructure (e.g. swales). In 2020, Stage-1 of the design and build contract went on with enabling works, design projects and surveys. Residential travel plans were provided to the developer, who welcomed the idea of providing opportunities for higher levels of active travel in the area.</p> <p>Beam Park Station: Project works are operated by Network Rail. When it is completed (expected in late 2022), local residents will have direct access to the London-Tilbury C2C line.</p> <p>Romford Ring Road: 2020 saw the design phase progressing as part of Stage-1 of the design and build contract.</p>
3.11	Emissions from developments and buildings	Identify previously unknown and new premises that require permitting under PPC.	<i>Action on hold.</i> Due to impacts of Covid-19 on staff welfare and diversion to other urgent duties this work was place on hold in 2020.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
		Determine these properties that require permitting for Pollution Prevention Control (PPC).	There will be a further review to decide whether capacity or resources allow progression of this action in 2021.
3.12	Emissions from developments and buildings	Signpost business contact and residents to the appropriate boiler scrappage schemes and energy efficiency grants; Promote businesses and residents to take air quality and energy efficiency advice; embed this practice as part of business as usual activity of the department	<i>Action ongoing.</i> Havering's website ( <a href="https://www.havering.gov.uk/greenhomesgrant">https://www.havering.gov.uk/greenhomesgrant</a> ) signposts visitors towards energy grant opportunities to apply for.
4.1	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Include requirement for suppliers of large council contracts that they have attained silver or gold FORS accreditation for their organisation and vehicles	<i>Action completed.</i> Havering requires external suppliers to have this accreditation.
4.2	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Investigate the feasibility of introducing dedicated drop off zones outside all schools for buses & coaches.	<i>Action cancelled.</i> Following investigation, the Council's Highways and Parking Services have advised that this action is not feasible because of the existing keep clear zones outside all schools which must remain in place.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
4.3	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Renewal of Taxi Framework, with suppliers complying to the Ultra Low Emission Zone (ULEZ) & exploring ZEC (Zero Emission Capable) Standards	<i>Action ongoing.</i> The item is dependent on the actions of TfL as the Council does not have an active role in this. Through our communication channels, taxi drivers were made aware of the requirements of ULEZ and promoted the locations of rapid chargers for electric taxis. ULEZ is being expanded in October 2021 and the Council is working with TfL to publicise this through communication channels.
4.4	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Provide Smarter Driver Training for all vocational drivers of the Council's fleet vehicles. Delivered by CPC training and FTA Van excellence accreditation	<i>Action partly on hold.</i> In 2020 many of the training was postponed due to lockdown and the social distancing measures required for Covid-19. Normally, a significant part of the Council's fleet drivers (mostly large vehicles) receive the LoCity training. The emphasised areas are anti-idling, efficient driving and cycle awareness (being aware of more vulnerable users of the road). Gas-to-liquid fuel has been used in all Council vehicles since 2019, Havering was the first London Borough to achieve that.
4.5	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Investigate the feasibility on the delivery of Electric Vehicle Charging Point infrastructure across the borough.	<i>Action ongoing.</i> An Electric Vehicle Charging Strategy and Implementation Plan has been drafted. Funding bids will be submitted in the summer of 2021 for EV Charing Points to be delivered across Havering.
4.6	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet	Review parking charges policy (controlled parking zones)	<i>Action cancelled,</i> as reported in 2020.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
	actions, localised solutions and cleaner transport)		
4.7	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Engage with businesses in the borough through business forums to discuss the options for upgrading/retrofitting to accommodate ULEZ requirements.	<i>Action on hold.</i> Due to the pandemic business forums were not held in 2020.
4.8	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Plant greenery and trees (e.g. hedgerows and trees such as ash, common alder, field maple, larch, Norway maple, scots pine and silver birch) along main roads and town centres, which can lead to an improvement in air quality based on available evidence	<p><i>Action on hold.</i> Planting was not carried out in 2020 due to lack of funding.</p> <p>However, Havering engaged with Carbon Footprint in their programme to provide free trees and accessories to schools around the UK. This opportunity was promoted to all schools in Havering with successful results.</p>
4.9	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Develop Local Implementation Plan to support improvements in local air quality; together with working with TfL to ensure pollution sources outside of local control i.e. buses and commuter traffic are dealt with.	<i>Action completed.</i> The Council's LIP3 was formally approved by the TfL in 2019 setting out how the borough will deliver the Mayor's Transport Strategy at a local level. This includes improving air quality through sustainable transport measures. Delivery of the Local Implementation Plan was challenging in 2020 because of limited funding due to the Pandemic but it is hoped that further funding will become available in 2021.
4.10	Emissions from transport (covers the	Undertake feasibility work to examine the air quality implications of re-	<i>Action on hold.</i> Progression of this action will be reviewed in 2021.

Measure	LLAQM Action Matrix Theme	Action	<p style="text-align: center;"><b>Progress</b></p> <ul style="list-style-type: none"> <li>• Emissions/Concentration data               <ul style="list-style-type: none"> <li>• Benefits</li> </ul> </li> <li>• Negative impacts / Complaints</li> </ul>
	Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	routing of bus services away from Romford town centre and look options for improving sustainable travel access into Romford town centre.	
4.11	Emissions from transport (covers the Matrix themes: Delivery servicing and freight, borough fleet actions, localised solutions and cleaner transport)	Continue to routinely check the weighbridges used commercially by (usually large) vehicles	<i>Action ongoing.</i> This action aims to reduce the number of overloaded vehicles and is expected to lead to a reduction in emissions. 5 checks were carried out in 2020.



#### 4. Planning Update and Other New Sources of Emissions

**Table K. Planning requirements met by planning applications in London Borough of Havering in 2020**

Condition	Number
Number of planning applications where an air quality impact assessment was reviewed for air quality impacts	14
Number of planning applications required to monitor for construction dust	3
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	
Number of developments required to install Ultra-Low NO <sub>x</sub> boilers	59
Number of developments where an AQ Neutral building and/or transport assessments undertaken	13
Number of developments where the AQ Neutral building and/or transport assessments not meeting the benchmark and so required to include additional mitigation	0
Number of planning applications with S106 agreements including other requirements to improve air quality	0
Number of planning applications with CIL payments that include a contribution to improve air quality	0
<p><b>NRMM: Central Activity Zone and Canary Wharf</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered with the GLA through the relevant <a href="#">NRMM website</a> and that all NRMM used on-site is compliant with Stage IIIB of the Directive and/or exemptions to the policy.</p>	N/A
<p><b>NRMM: Greater London (excluding Central Activity Zone and Canary Wharf)</b></p> <p>Number of conditions related to NRMM included.</p> <p>Number of developments registered and compliant.</p> <p>Please include confirmation that you have checked that the development has been registered at <a href="http://www.nrmm.london">www.nrmm.london</a> and that all NRMM used on-site is compliant with Stage IIIA of the Directive and/or exemptions to the policy.</p>	<p>Number of Conditions: 40</p> <p>Number of developments registered: 20*</p> <p>Number of developments compliant on site: 15*</p> <p>*The numbers of developments registered and compliant have been derived from the NRMM annual report for Havering</p>

The Council's Planning Service consults the Public Protection Service on all valid planning applications received, including major developments. Public Protection Officers then review and assess these applications recommending air quality conditions where required. Once a planning consultation response has been sent the progress of the planning application is not monitored by Public Protection (e.g. whether the application has been granted planning permission or not, whether the recommended conditions have been attached or not etc.).

However the Planning Service will, usually, adopt our recommendations and the relevant conditions are attached to the planning decisions. Once an application for discharge of condition has been submitted, Public Protection is consulted again and the submitted documentation is reviewed and assessed. The condition is discharged once the documentation has been considered sufficiently in line with current guidance.

#### **4.1 New or significantly changed industrial or other sources**

No new sources identified.

## **Appendix A      Details of Monitoring Site Quality QA/QC**

### **A.1      Automatic Monitoring Sites**

HV1 and HV3 are representative of roadside exposure within the Borough. All the sites are part of the London Air Quality Network and therefore the standards of QA/QC are similar to those of the government's AURN sites. Regular monthly calibrations are carried out, with subsequent data ratification undertaken by ERG at Imperial College London. The data for 2020 have been ratified.

Data capture from the NO<sub>x</sub> analysers at HV1 and HV3 in 2018 were 99% and 98% respectively.

#### PM<sub>10</sub> Monitoring Adjustment

PM<sub>10</sub> at HV3, and PM<sub>10</sub> and PM<sub>2.5</sub> at HV1 are measured by FDMS, consequently correction is not necessary.

### **A.2      Diffusion Tubes**

Diffusion Tubes are supplied and analysed by Socotec, Didcot. For 2020 tubes are prepared by spiking acetone: triethanolamine (50:50) onto grids prior to the tubes being assembled. The tubes are desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. The tubes were analysed in accordance with Socotec's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance'. As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values have been adjusted to 20°C to allow for direct comparison with EU limits. As set out in the 2017 - 2020 Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies Socotec Didcot is listed in the table of laboratories with Good Precision. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a Satisfactory laboratory.

The bias adjustment factor for Socotec, for the 50% TEA in Acetone preparation method in 2020, taken from the National Bias Adjustment Factor Spread sheet (v03\_21) is 0.77.

The London Borough of Havering has a triplicate diffusion tube co-location study at one of the roadside automatic monitoring sites, operational since 2015. Due to Waterloo Road being a high concentration site (roadside site) any bias adjustment factors derived should not be used for any low concentration monitoring sites.

Discussion of Choice of Factor to Use

**Table L. Bias Adjustment Factor**

<b>Year</b>	<b>Local or National</b>	<b>If Local, Version of National Spreadsheet</b>	<b>Adjustment Factor</b>
2020	National	06/21	0.77
2019	National	09/20	0.77
2018	National	06/19	0.76
2017	National	03/18	0.77
2016	National		0.77
2015	National		0.79
2014	National		0.81

### **A.3 Adjustments to the Ratified Monitoring Data**

#### **Short-term to Long-term Data Adjustment**

Capture rates for NO<sub>2</sub> at our two continuous monitoring stations were above 75% therefore annualisation was not necessary for 2020.

Due to the COVID-19 lockdown diffusion tubes were exposed for three months (March-June 2020). It was decided not to use this data, as the exposure period was significantly longer than the 4-5 week recommended. This, combined with a few missing diffusion tubes on other occasions likely due to weather, birds or theft, meant data capture was less than 75%. For these diffusion tubes annualisation was undertaken.

The LAQM Diffusion Tube Data Processing Tool (<https://laqm.defra.gov.uk/air-quality-assessment/>) was used for the annualisation of the diffusion tubes. Two background continuous monitoring sites with data capture greater than 85% were used; Redbridge – Ley Street (96% data capture) and Newham – Wren Close (95% data capture). The annualisation results are provided in Table M.

#### **Distance Adjustment**

The data presented in Table N has been adjusted for distance, using the LAQM Diffusion Tube Data Processing Tool. Local Annual Mean Background NO<sub>2</sub> Concentrations have been identified using the 2020 Defra reference background maps.

**Table M. Short-Term to Long-Term Monitoring Data Adjustment**

Site ID	Annualisation Factor Redbridge - Ley Street	Annualisation Factor Newham - Wren Close	Annualisation Factor	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean ( $\mu\text{g m}^{-3}$ )	Annualised Annual Mean ( $\mu\text{g m}^{-3}$ )	Comments
HAV36	1.0183	1.0053	-	-	1.0118	26.8	27.2	
HAV40	0.9473	0.9178	-	-	0.9326	51.2	47.8	
HAV48	1.0720	1.0131	-	-	1.0425	26.6	27.7	
HAV49	0.9002	0.8794	-	-	0.8898	34.5	30.7	
HAV50	0.9492	0.9197	-	-	0.9345	45.2	42.2	
HAV52	0.9250	0.9764	-	-	0.9507	35.6	33.8	
HAV53	0.9966	1.0142	-	-	1.0054	37.6	37.8	
HAV54	0.9437	0.9070	-	-	0.9254	30.0	27.8	
HAV55	0.9385	0.9293	-	-	0.9339	49.9	46.6	
HAV63	1.0720	1.0131	-	-	1.0425	38.0	39.6	
HAV64	0.9958	0.9457	-	-	0.9707	41.4	40.2	

**Table N. NO<sub>2</sub> Fall off With Distance Calculations**

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted ( $\mu\text{g m}^{-3}$ ))	Background Concentration ( $\mu\text{g m}^{-3}$ )	Concentration Predicted at Receptor ( $\mu\text{g m}^{-3}$ )	Comments
HAV6, HAV5, HAV2	3.0	4.0	38.2	20.7	36.9	Predicted concentration at receptor within 10% the AQ objective
HAV7, HAV1, HAV8	8.0	11.0	38.6	20.7	36.6	Predicted concentration at receptor within 10% the AQ objective
HAV27, HAV28, HAV29	0.5	5.5	44.4	19.8	33.9	
HAV32, HAV33, HAV34	0.5	4.5	45.2	18.9	35	
HAV40	1.0	10.0	36.8	17.5	27.8	
HAV57	0.2	1.2	<b>52.9</b>	20.7	<b>44.1</b>	Predictive concentration at receptor above the AQ objective
HAV58, HAV59, HAV60	0.2	1.2	<b><u>66.9</u></b>	20.7	<b>54.3</b>	Predictive concentration at receptor above the AQ objective

## Appendix B Full Monthly Diffusion Tube Results for 2020

Table O. NO<sub>2</sub> Diffusion Tube Results

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
HAV6	-	58	-	-	-	-	-	49.8	33.4	50.7	48.0	40.3	61.9	53.1	<b>49.7</b> <sup>(c)</sup>	38.2 <sup>(c)</sup>
HAV5	-	75	67.7	46.4	-	-	-	49.1	32.0	49.3	46.3	47.4	62.1	51.7		
HAV2	-	75	67.1	42.0	-	-	-	47.0	33.3	48.4	48.7	47.6	62.2	43.9		
HAV7	-	75	49.4	38.5	-	-	-	94.6	29.2	36.9	42.3	48.7	57.3	49.5	<b>50.1</b> <sup>(c)</sup>	38.6 <sup>(c)</sup>
HAV1	-	75	53.5	31.4	-	-	-	100.1	27.1	37.7	40.5	47.9	54.9	50.5		
HAV8	-	75	50.9	42.8	-	-	-	108.0	24.8	39.7	41.8	49.1	56.5	48.6		
HAV3	-	75	52.1	38.7	-	-	-	21.6	18.9	24.3	25.6	30.6	43.4	38.7	32.7	25.1
HAV4	-	75	33.8	20.1	-	-	-	13.0	12.1	16.7	20.1	22.4	30.6	26.2	21.7	16.7
HAV9	-	75	64.1	35.1	-	-	-	23.4	20.1	25.0	31.8	36.3	41.5	40.1	34.7 <sup>(c)</sup>	26.7 <sup>(c)</sup>
HAV10	-	75	57.5	35.7	-	-	-	22.9	21.7	26.2	31.5	36.2	43.3	41.3		
HAV11	-	75	63.1	29.5	-	-	-	24.0	22.5	24.8	29.6	31.7	38.9	38.0		
HAV12	-	75	50.5	34.4	-	-	-	26.3	29.9	30.9	38.7	36.3	44.6	39.0	36.7	28.3
HAV13	-	75	58.2	41.4	-	-	-	34.7	31.2	37.9	44.5	37.7	50.4	43.6	<b>41.9</b> <sup>(c)</sup>	32.2 <sup>(c)</sup>
HAV14	-	75	55.6	39.3	-	-	-	34.5	28.9	40.1	44.3	40.6	50.0	48.0		
HAV15	-	75	55.4	27.2	-	-	-	32.7	32.6	40.0	43.6	43.0	50.2	44.6		
HAV16	-	75	54.1	38.6	-	-	-	32.7	22.1	34.3	38.9	40.0	46.0	44.3	37.8 <sup>(c)</sup>	29.1 <sup>(c)</sup>
HAV17	-	67	58.2	15.8	-	-	-	25.3	23.7	32.2	39.3	-	48.1	45.9		
HAV18	-	67	45.8	33.0	-	-	-	33.0	-	34.3	41.4	39.6	46.0	44.7		
HAV19	-	75	69.3	47.9	-	-	-	44.5	33.5	43.6	46.0	47.2	54.8	42.9	<b>46.4</b> <sup>(c)</sup>	35.7 <sup>(c)</sup>
HAV20	-	58	65.8	43.7	-	-	-	43.6	-	40.0	39.5	45.2	-	46.3		
HAV21	-	75	61.3	37.6	-	-	-	44.1	34.7	42.0	42.9	47.9	55.3	44.4		
HAV22	-	75	45.5	33.0	-	-	-	20.8	15.6	22.8	24.1	33.0	43.8	36.2	28.7 <sup>(c)</sup>	22.1 <sup>(c)</sup>
HAV23	-	75	39.1	29.7	-	-	-	20.7	14.6	20.4	23.2	29.5	39.6	32.9		
HAV24	-	75	41.6	26.9	-	-	-	24.6	15.8	21.6	25.9	27.9	30.8	35.8		



Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
HAV25	-	75	36.1	28.1	-	-	-	19.1	16.5	19.7	22.7	26.3	30.8	30.5	25.5	19.7
HAV26	-	75	41.5	25.3	-	-	-	17.3	12.2	17.3	19.5	25.8	35.9	32.8	25.3	19.5
HAV27	-	75	73.0	57.8	-	-	-	54.5	42.9	57.2	60.1	59.7	67.0	58.4	<b>57.6</b> <sup>(c)</sup>	<b>44.4</b> <sup>(c)</sup>
HAV28	-	75	75.8	52.0	-	-	-	55.4	43.8	51.8	61.0	53.3	53.2	62.1		
HAV29	-	67	72.7	54.0	-	-	-	49.0	45.5	52.4	63.1	60.0	-	59.5		
HAV30	-	75	44.9	22.3	-	-	-	17.5	16.1	20.7	27.7	28.4	39.5	32.1	27.7	21.3
HAV31	-	75	45.8	30.1	-	-	-	20.0	16.4	21.9	24.8	27.9	37.8	33.0	28.6	22.0
HAV32	-	67	91.5	-	-	-	-	46.1	47.1	52.5	60.2	64.0	64.2	61.8	<b>58.7</b> <sup>(c)</sup>	<b>45.2</b> <sup>(c)</sup>
HAV33	-	75	82.4	71.8	-	-	-	44.2	39.4	44.5	52.3	56.0	66.1	56.4		
HAV34	-	75	78.1	69.3	-	-	-	45.1	42.6	43.0	56.3	59.0	67.1	54.5		
HAV35	-	75	36.0	24.4	-	-	-	21.1	16.1	22.4	25.8	26.1	33.0	26.1	25.7	19.8
HAV36	-	58	29.4	-	-	-	-	12.8	12.1	15.3	52.7	19.8	-	45.8	26.8	20.9
HAV37	-	75	72.3	44.4	-	-	-	37.9	42.6	40.7	22.3	46.3	57.8	38.5	<b>44.8</b>	34.5
HAV38	-	75	38.1	25.3	-	-	-	17.2	13.7	16.1	29.1	25.5	40.4	34.1	26.6	20.5
HAV39	-	75	58.0	42.1	-	-	-	35.3	21.8	29.0	52.3	35.5	49.3	38.0	<b>40.1</b>	30.9
HAV40	-	67	65.4	60.7	-	-	-	36.2	-	41.5	47.9	48.5	57.7	52.0	51.2	36.8
HAV41	-	75	57.6	39.8	-	-	-	33.8	30.1	38.1	35.7	44.4	47.1	50.0	<b>41.8</b>	32.2
HAV42	-	75	53.0	31.9	-	-	-	26.7	21.0	28.0	34.1	34.5	42.3	38.5	34.4	26.5
HAV43	-	75	51.5	39.4	-	-	-	19.8	25.6	28.0	36.4	35.1	44.3	38.1	35.4	27.2
HAV44	-	75	56.7	38.0	-	-	-	32.8	23.9	32.6	36.7	40.6	51.2	38.9	39.0	30.1
HAV45	-	75	50.5	34.0	-	-	-	25.1	24.6	27.5	31.9	36.2	42.1	38.3	34.5	26.5
HAV46	-	75	50.5	33.8	-	-	-	28.1	23.2	30.3	42.7	36.2	42.7	37.8	36.1	27.8
HAV47	-	75	59.4	41.8	-	-	-	50.8	28.5	48.8	25.1	46.4	62.8	52.1	<b>46.2</b>	35.6
HAV48	-	58	-	-	-	-	-	18.8	15.3	21.6	25.8	30.0	40.5	34.3	26.6	21.4
HAV49	-	58	45.3	32.1	-	-	-	20.8	-	-	40.2	30.4	39.2	33.3	34.5	23.6
HAV50	-	67	68.7	67.5	-	-	-	-	28.5	36.0	21.9	48.2	52.6	37.9	<b>45.2</b>	32.5
HAV51	-	75	40.7	25.7	-	-	-	18.1	14.6	16.6	31.5	27.4	37.0	30.2	26.9	20.7
HAV52	-	42	47.2	35.1	-	-	-	34.8	20.0	-	-	-	-	40.9	35.6	26.1
HAV53	-	58	57.3	37.3	-	-	-	15.5	26.0	28.7	-	56.3	-	42.4	37.6	29.1
HAV54	-	58	35.7	28.7	-	-	-	-	17.1	25.4	-	32.3	40.5	30.4	30.0	21.4
HAV55	-	67	63.4	44.1	-	-	-	38.5	36.6	-	55.1	49.9	61.5	49.9	<b>49.9</b>	35.9
HAV56	-	75	56.2	49.6	-	-	-	42.1	35.3	42.4	45.9	44.1	54.1	47.6	<b>46.4</b>	35.7

Site ID	Valid data capture for monitoring period % <sup>(a)</sup>	Valid data capture 2020 % <sup>(b)</sup>	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sept	Oct	Nov	Dec	Annual mean – raw data	Annual mean – bias adjusted
HAV57	-	75	95.8	55.9	-	-	-	68.1	50.4	67.2	69.0	67.2	75.0	69.8	<b>68.7</b>	<b>52.9</b>
HAV58	-	58	-	-	-	-	-	45.3	73.8	94.9	103.2	91.5	99.3	80.2	<b>86.9</b> <sup>(c)</sup>	<b>66.9</b> <sup>(c)</sup>
HAV59	-	75	127.0	89.6	-	-	-	43.5	72.9	93.2	98.7	68.3	98.0	89.7		
HAV60	-	75	123.5	88.3	-	-	-	46.0	71.9	85.2	91.6	88.9	95.1	71.5		
HAV61	-	75	41.8	29.0	-	-	-	24.9	18.4	23.4	27.3	26.7	38.5	36.1	29.6	22.8
HAV62	-	75	68.9	44.1	-	-	-	29.6	29.8	37.1	43.6	46.1	50.9	48.1	<b>44.2</b>	34.1
HAV63	-	58	-	-	-	-	-	31.5	30.1	35.7	41.5	44.4	50.9	31.8	38.0	30.5
HAV64	-	67	65.6	-	-	-	-	29.7	27.8	32.1	37.3	42.3	50.5	45.7	<b>41.4</b>	30.9
HAV65	-	75	54.7	38.6	-	-	-	28.5	24.9	31.4	36.4	35.8	47.8	38.6	37.4	28.8
HAV66	-	75	60.1	49.5	-	-	-	35.2	32.6	39.0	44.1	47.1	50.4	46.3	<b>44.9</b>	34.6

## Notes

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

Exceedances of the NO<sub>2</sub> annual mean AQO of 40  $\mu\text{g m}^{-3}$  are shown in **bold**.

NO<sub>2</sub> annual means in excess of 60  $\mu\text{g m}^{-3}$ , indicating a potential exceedance of the NO<sub>2</sub> hourly mean AQS objective are shown in **bold and underlined**.

All means have been “annualised” in accordance with LLAQM Technical Guidance if valid data capture for the calendar year is less than 75% and greater than 33%.

(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) This is a triplicate site. The Diffusion Tube Data Processing Tool calculated annual mean for the site and not for each of the diffusion tubes.

## Appendix C Monitoring Sites Maps





