



2015 Updating and Screening Assessment for **London Borough of Tower Hamlets**

In fulfillment of Part IV of the
Environment Act 1995
Local Air Quality Management

May, 2015

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Report Reference number	2015_USA_Tower Hamlets
Date	May 2015

Executive Summary

This 2015 Updating and Screening Assessment for Tower Hamlets reviews and assesses air quality against the objectives in the Air Quality Regulations 2000 and amendment regulations. The air quality objectives to be assessed by local authorities are for the following seven pollutants: carbon monoxide, benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide and particles (PM₁₀).

The role of the Review and Assessment process is to identify any relevant areas in the Borough where it is considered that the government's air quality objectives for the above air pollutants will be exceeded. The Council has previously undertaken the earlier rounds of Review and Assessment of local air quality management and identified areas where some of the objectives are exceeded and where there is relevant public exposure.

This report concerns the sixth round Updating and Screening Assessment of air quality in the London Borough of Tower Hamlets. For this, pollution sources have been re-examined and recent air quality monitoring checked in the Borough in accordance with Defra LAQM guidance.

The report identifies that:

For carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide there is not a significant risk of the objectives being exceeded in the Council's area.

For nitrogen dioxide and particles (specifically PM₁₀) the Council has previously designated an AQMA across the Borough. The findings from this report indicate that the AQMA should be maintained.

In view of the findings from the report the Council will undertake the following actions:

1. Undertake consultation with the statutory and other consultees as required.
2. Maintain the existing monitoring programme.

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3. Continue with the implementation of its Air Quality Action Plan in pursuit of the AQS objectives.
4. Prepare for the submission of its next Air Quality report.

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1 Introduction

1.1 Description of Local Authority Area

The London Borough of Tower Hamlets is situated in the east of London. The River Thames borders to the south, with the London Boroughs of Newham to the east, Greenwich to the south (i.e. the other side of the River Thames), the City of London to the west and Hackney to the north. It covers an area of about 7.5 square miles (1,900 hectares) and includes the Canary Wharf development in Docklands. The estimated population for 2013 is 263,003 (ONS).

The Borough includes the following areas: Bethnal Green, Bow, Isle of Dogs, Millwall, Mile End, Poplar Stepney, Wapping and Whitechapel. The European or world headquarters of many global financial businesses employing some of the highest paid workers in London are located within the Borough. Conversely it also includes the highest level of child poverty in England, very high rates of long term illness and premature death and the 2nd highest unemployment rate in London.

The main sources of atmospheric pollutants are from road transport, although there are important industrial sources close to its boundaries. The principal roads include sections of the A13, A12, and A11 trunk roads; plus the Borough Principal Roads: A1203, A1261, A1000 and A1205. The Borough includes the portals for the Blackwall and Rotherhithe Tunnels (on the north side of the Thames) and also Tower Bridge, which forms part of the eastern edge of central London's Congestion Charging area.

The other major sources of emissions in the Borough include those from residential and commercial premises, which mainly relate to gas boilers used for space and water heating; and construction sites, including dust and machinery emissions.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities

to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g m}^{-3}$	Running annual mean	31.12.2003
	5.00 $\mu\text{g m}^{-3}$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g m}^{-3}$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg m^{-3}	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g m}^{-3}$	Annual mean	31.12.2004
	0.25 $\mu\text{g m}^{-3}$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g m}^{-3}$ not to be	1-hour mean	31.12.2005

	exceeded more than 18 times a year		
	40 $\mu\text{g m}^{-3}$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g m}^{-3}$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g m}^{-3}$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g m}^{-3}$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g m}^{-3}$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g m}^{-3}$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

The London Borough of Tower Hamlets previously completed all earlier stages of air quality review and assessment as required under the LAQM regime. As part of its earlier duties the Council completed a Detailed Stage 4 Assessment for nitrogen dioxide (NO₂) and particles (PM₁₀). The aim of the Council's Detailed Assessment was to determine with reasonable certainty whether or not there was a likelihood of the AQ objectives being achieved. The assumptions in the Detailed Assessment were therefore in depth and the data used were quality assured to a high standard. This allowed the Council to have confidence in reaching a decision whether to declare an Air Quality Management Area or not. When carrying out this Detailed Assessment the Council applied its best estimates to all of the components used to produce the estimated future concentrations.

These earlier predictions highlighted that large areas exceeded the objectives, mainly close to busy roads and junctions throughout the Borough. Relevant public exposure was identified in these areas and on the basis of the findings **the Council designated the whole Borough an Air Quality Management Area (AQMA) for the NO₂ and PM₁₀ in 2000**. The Council also completed all previous rounds of LAQM. The conclusion of this previous work was that the Council should maintain its AQMA.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Automatic monitoring in the Borough has been undertaken at three fixed long-term sites. The automatic sites operating at the time of report writing are:

Tower Hamlets 2 (at Mile End Road (TH2)) – this is a roadside site on the A11 in a central part of the Borough. This site has been operating since March 1994. The site monitors nitrogen dioxide and carbon monoxide.

(See

http://www.londonair.org.uk/london/asp/publicdetails.asp?site=TH2&Mapttype=Google&mapview=All&la_id=30&zoom=11&lat=51.5157&lon=-0.0346346999999696&laEdge=Y&details=general)

Tower Hamlets 4 (at Blackwall Tunnel (TH4)) – this is a roadside site on the A12 near Blackwall Tunnel on the east of the Borough. This site has been operating since September 2006. The site monitors nitrogen dioxide, PM₁₀ (by FDMS), PM_{2.5} (by FDMS) and ozone.

(See

http://www.londonair.org.uk/london/asp/publicdetails.asp?site=TH4&Mapttype=Google&mapview=All&la_id=30&zoom=11&lat=51.5157&lon=-0.0346346999999696&laEdge=Y&details=general)

Tower Hamlets 5 (at Victoria Park (TH5)) – this is a urban background site approximately 300m west of the busy A12 towards the edge of the Borough close to Hackney and Newham. This site started operating since July 2012 and the sample inlet is located around 2.5m above ground level. The site monitors nitrogen dioxide, PM₁₀ (by TEOM), sulphur dioxide and ozone.

(See

http://www.londonair.org.uk/london/asp/publicdetails.asp?site=TH5&Mapttype=Google&mapview=All&la_id=30&zoom=11&lat=51.5157&lon=-0.0346346999999696&laEdge=Y&details=general)

One other site was in operation since 2012, as follows:

Tower Hamlets 1 (at Poplar (TH1)) – this site was at an urban background site in the grounds of a primary school in Poplar, towards the south of the Borough. This site

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started operating in January 1994 and the sample inlet is located around 2.5m above ground level. The site monitored nitrogen dioxide, PM₁₀ (by TEOM), sulphur dioxide and ozone. The site closed in July 2013.

(See

http://www.londonair.org.uk/london/asp/publicdetails.asp?site=TH1&Maptype=Google&mapview=All&a_id=30&zoom=11&lat=51.5157&lon=-0.03463469999999696&laEdge=Y&details=general)

The above sites are also representative of relevant exposure. All the sites are part of the London Air Quality Network (LAQN) operated by King's College London and therefore the standards of QA/QC are similar to those of the government's AURN sites. Regular calibrations are carried out, with subsequent data ratification undertaken by King's College London. In all cases the data are fully ratified unless reported otherwise. Further details of the monitoring can be found at www.londonair.org.uk.

The Council does not undertake non-continuous monitoring.

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Poplar (TH1) <i>(closed July 2013)</i>	Background	537509	180867	NO ₂ PM ₁₀ SO ₂ (and O ₃)	Y	TEOM	Y	N/A	N
Mile End (TH2)	Roadside	535927	182221	NO ₂ CO	Y	N/A	Y	4.2	Y
Blackwall (TH4)	Roadside	538290	181452	NO ₂ PM ₁₀ PM _{2.5} (and O ₃)	Y	FDMS	Y	4	Y
Victoria Park (TH5)	Background	536487	184238	NO ₂ PM ₁₀ SO ₂ (and O ₃)	Y	TEOM	Y	300	N

2.2 Comparison of Monitoring Results with Air Quality Objectives

The monitoring reported below represents the continuous results for recent years up to the end of 2014. The results are reported in accordance with the requirements of TG09 and further details of the automatic sites, including site maps, site photographs, can be found on the King's College London LAQN website. (See <http://www.londonair.org.uk/london/asp/lahome.asp>).

2.2.1 Nitrogen Dioxide

2.2.1.1 Automatic Monitoring Data

The nitrogen dioxide monitoring results for the automatic sites in the Council's area are compared directly to the annual mean and hourly mean objectives. The following tables (Tables 2.2 and 2.3) provide results for the period from 2010 to 2014 inclusive. The data are fully ratified apart from 2014, which includes provisional data. The sites locations are considered typical of public exposure in much of the Borough. However as noted earlier, it is the roadside areas within the Borough that have the highest concentrations.

Data capture for 2014 was good at the two roadside sites Mile End (TH2) and Blackwall (TH4) (respectively 100% and 99%). At the background site in Victoria Park (TH3), monitoring stopped in May 2014; the data capture achieved only 38% of the full year. The annual mean concentration for this site was annualised, as mentioned in box 3.2 of the TG (09); and the 99.8th percentile of the 1-hour mean was included for comparison with the number of exceedences of the hourly mean.

The annual mean objective of $40 \mu\text{g m}^{-3}$ was easily exceeded at the two roadside sites, with concentrations close to $60 \mu\text{g m}^{-3}$ for both sites; $62 \mu\text{g m}^{-3}$ for TH2 (Mile End) and $58 \mu\text{g m}^{-3}$ for TH4 (Blackwall). The objective was previously greatly exceeded at these two roadside sites for all years reported. The annual mean objective was also exceeded at the background site TH5 (Victoria Park) with $44.8 \mu\text{g m}^{-3}$. This monitoring site only achieved 38% data capture in 2014 and hence the data were adjusted using a factor derived from background sites in Westminster, Kensington and Chelsea and Barking and Dagenham in accordance with TG09.

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Monitoring from previous years at the TH5 site however showed no exceedance of the objective. It is not clear without further investigation as to why concentrations increased in 2014. (Note - concentrations at the site for 2015 (to date) are lower and indicate that the objective will be met).

The background TH1 site in Poplar closed in 2013, although the annual mean objective was not exceeded there for the period reported. Annual mean Concentrations were typically around $34 \mu\text{g m}^{-3}$ for most years.

Table 2.3 reports the number of exceedences of the 1-hour mean objective of $200 \mu\text{g m}^{-3}$. The objective of not more than 18 exceedences was met at every site. During 2014 the two roadside sites each only had one period that exceeded the standard.

In previous years the objective had been met at all sites. The highest number of exceedences of the hourly mean standard recorded was 7, in 2010 at the roadside TH4 site.

Table 2.2 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2014 % ^b	Annual Mean Concentration $\mu\text{g m}^{-3}$				
					2010	2011	2012	2013	2014 ^c
Poplar (TH1) <i>(closed July 2013)</i>	Background	Y	100 ^d	50 ^d	36	34	33	33 (34)	-
Mile End (TH2)	Roadside	Y	N/a	100	65	57	60	57	62
Blackwall (TH4)	Roadside	Y	N/a	99	73	63	61	58	58
Victoria Park (TH5)	Background	Y	N/a	38	-	-	33	33	44 (44.8)

^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 “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

^d Data capture for 2013.

Table 2.3 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2014 % ^b	Number of Exceedences of Hourly Mean (200 µg m ⁻³)				
					2010	2011	2012	2013	2014 ^c
Poplar (TH1) <i>(closed July 2013)</i>	Background	Y	100 ^d	50 ^d	0	0	0	0	-
Mile End (TH2)	Roadside	Y	N/a	100	5	0	2	0	1
Blackwall (TH4)	Roadside	Y	N/a	99	7	0	0	0	1
Victoria Park (TH5)	Background	Y	N/a	38	-	-	0	0	0 (148)

^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 Where valid data is less than 90%, the 99.8th percentile of hourly means is in brackets.

^d Data capture for 2013.

2.2.2 PM₁₀

The TG09 guidance highlights that any PM₁₀ monitoring undertaken must conform to criteria relating to the gravimetric European reference method or its approved equivalent. The monitoring sites in the Borough use an FDMS analyser, which was found to be equivalent, and TEOM instruments, which were not found to meet the equivalence criteria, without correction. Previously for the TEOM a correction using a factor of 1.3 was accepted; now however the VCM (Volatile Correction Model) has been adopted for this purpose.

This method is based on the assumption that the volatile component of PM₁₀ lost during the heated sampling of PM with the standard TEOM is consistent across a defined geographical area. The model uses the FDMS purge measurement as an indicator of this volatile component. As FDMS instruments have met the equivalence criteria, the VCM correction is also considered equivalent to the European reference method.

The results for the Tower Hamlets sites are reported below as **reference equivalent**, these represent either FDMS measurements (where no correction has been made) or TEOM measurements that were corrected using the VCM. The data are all fully ratified other than for 2014, which includes provisional data.

In 2014 PM₁₀ monitoring was undertaken at two sites, for which the data capture was low. Data capture achieved 63% for the roadside site TH4; 38% for the background site TH5 (monitoring stopped in May 2014). The annual mean concentrations for both these sites have been annualised (Table 2.4), and the 90th percentiles of the 24-hour mean have been included (Table 2.5). The annual adjustment factor was derived from background sites in Bexley, Thurrock and Westminster.

The annual mean objective of 40 µg m⁻³ was met at all sites and for every year reported, with concentrations always between 20 and 30 µg m⁻³. The only exception was a lower annual concentration of 18 µg m⁻³ in 2012 at the background site TH5.

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Table 2.5 shows the number of exceedences of the 24-hour mean objective of $50 \mu\text{g m}^{-3}$. The objective was met at both sites in 2014, with the number of periods exceeding the standard fewer than 35. In the previous years reported the objective has also always been met too.

The roadside site TH4 recorded 16 periods that exceeded in 2014. This was lower than previous years, although it is not possible without further investigation to determine whether this was due to meteorology during 2014 or other reasons. The site however has recorded concentrations that are border-line with the objective as recently as 2011, when 32 periods exceeding the objective were recorded.

The background site TH5 which opened in 2012 also met the objective with a very few number of exceedences (2, 5 and 6 in 2012, 2013 and 2014 respectively). The background site TH1 which closed in 2013 also met the objectives for each year reported.

Table 2.4 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2014 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration $\mu\text{g m}^{-3}$				
						2010	2011	2012	2013 ^c	2014 ^c
Poplar (TH1) <i>(closed July 2013)</i>	Background	Y	100 ^d	50 ^d	Y	22	23	22	23 (21)	-
Blackwall (TH4)	Roadside	Y	N/a	63	Y	29	28	26	28	29 (28.3)
Victoria Park (TH5)	Background	Y	N/a	38	Y	-	-	18	21	22 (20.2)

^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 "annualised" as in Box 3.2 of TG(09), as monitoring was not carried out for the full year.

^d Data capture for 2013.

Table 2.5 Results of Automatic Monitoring for PM¹⁰: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2014 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µgm ⁻³)				
						2010	2011	2012	2013	2014 ^c
Poplar (TH1) <i>(closed July 2013)</i>	Background	Y	100 ^d	50 ^d	Y	6	16	14	4 (39)	-
Blackwall (TH4)	Roadside	Y	N/a	63	Y	18	32	24	24	16 (46.4)
Victoria Park (TH5)	Background	Y	N/a	38	Y	-	-	2	5	6 (35.7)

^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 The 90th percentile of 24-hour means is in brackets

^d Data capture for 2013.

2.2.3 Sulphur Dioxide

Automatic monitoring of SO₂ in 2014 was undertaken at a representative urban background site in the Borough; at the TH5 site in Victoria Park. Monitoring at this site however stopped in May 2014, representing a data capture of only 38% of the full year. Relevant percentiles are included in brackets for the 2014 monitoring period at the TH5 site (see Table 2.6).

Monitoring was also previously undertaken at the background site in Poplar (TH1) until it closed in July 2013. The results at both sites are given in Table 2.6 below. These show that there were no periods that exceeded the 15 minute, hourly or 24 hourly standards of the UK AQS objectives.

The results for the period from 2009 also recorded no periods when these standards were exceeded at the TH1 site. As a consequence the AQS objectives were not exceeded and an AQMA for SO₂ has not been declared. This is in line with previous years and also other monitoring sites in London.

Table 2.6 Results of Automatic Monitoring of SO₂: Comparison with Annual Mean Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 %	Number of Exceedences (percentile in bracket $\mu\text{g m}^{-3}$) ^c		
				15-minute Objective (266 $\mu\text{g m}^{-3}$)	1-hour Objective (350 $\mu\text{g m}^{-3}$)	24-hour Objective (125 $\mu\text{g m}^{-3}$)
TH1	Urban	N	49 ^a	0	0	0
TH5	Urban	N	38	0 (20.7)	0 (16.7)	0 (6.5)

^a Data capture for 2013.

^c Data capture is less than 90%, the relevant percentile included in brackets

2.2.4 Other pollutants monitored

2.2.4.1 Carbon Monoxide

Automatic monitoring of CO was undertaken at the roadside site on Mile End Road (TH2) until March 2013. The data capture for the site exceeded 80% for all years reported other than 2013. There were no periods that exceeded the CO objective (i.e. a maximum rolling daily 8 hour mean of 10 mg m⁻³) in the years reported (see Table 2.7). Previous Council reports indicated that CO concentrations have decreased over time as a result of stricter emission controls on road vehicles, although this was mostly for the period from 1995 to 2002. Since then however concentrations have been little changed.

Table 2.7 Results of Automatic Monitoring for CO: Comparison with running 8-hour mean objective (2009-2013)

Site	2009	2010	2011	2012	2013
TH2	0	0	0	0	0

2.2.4.2 Ozone

Continuous measurement of ozone was undertaken at the background site in Poplar (TH1) site until closure in 2013, plus the roadside site at Blackwall TH4. The results for the period 2010 – 2014 are given in Table 2.8. The data capture for all years exceeded 90%; except TH1 site in 2013, which was 34%. Results from 2014 are only from the TH4 site which achieved a 92% data capture.

The Government's air quality objective, not to exceed 10 periods in a calendar year, was exceeded only at the TH1 background site during the period reported. This was during 2011 and 2012, although the objective was approached in the other years reported too, apart from 2013 when monitoring ceased. The TH4 roadside site met the objective for the period shown.

The LAQN annual mean index for ozone (which is based on an average of selected sites dependent on type and availability of data) has also shown that since 1996 through to the end of 2007 a 37% increase in levels (ERG, 2009). Thus this confirms that concentrations of ozone have increased across London.

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Lower ozone concentrations are normally expected at roadside sites as higher concentrations of NO_x lead to a local depletion of ozone concentrations. However the decrease in NO_x emissions within London has led to an increase in ozone concentrations, with 2012 having the highest number of periods exceeding for the five years shown at the TH4 roadside site. With diminishing NO_x concentrations, it is likely that future ozone concentrations in London will more closely resemble those in surrounding rural areas. It is this decrease in NO_x concentrations in London that is thought to be the main cause of the increase in annual mean ozone. The roadside sites monitoring ozone continue to provide an understanding of oxidation close to polluted areas and also future changes over time.

Table 2.8 Number of daily maxima exceeding 100 µg m⁻³ based on 8-hour running mean objective for ozone (2010-2014)

Site	2010	2011	2012	2013	2014
TH1	7	30	12	3	-
TH4	0	0	4	1	0

2.2.4.3 PM_{2.5}

The continuous measurement of PM_{2.5} was undertaken at the TH4 roadside site in Blackwall. The site used an FDMS instrument. The unadjusted annual mean results for the monitoring sites are given in Table 2.9. For all years reported the data capture was superior or close to 90%. In 2014 the TH4 site achieved 89.9% data capture.

Table 2.9 PM_{2.5} annual mean results (µg m⁻³) (2010 - 2014)

Site	2010	2011	2012	2013	2014
TH4	18.2	17.6	15.2	16.4	16.1

Reviews by the WHO and the Committee on the Medical Effects of Air Pollutants (COMEAP) suggested exposure to PM_{2.5} gives a stronger association with the observed ill-health effects of particles. It is also noted that there is evidence that the coarse fraction between (PM₁₀ – PM_{2.5}) has some effects on health (Defra, 2007).

As a consequence of this a PM_{2.5} objective was included in the 2007 Air Quality Strategy. This is based on the health advice for PM_{2.5}, which shows that there is no accepted threshold effect, i.e. there is no recognised safe level for exposure to fine

particles. As a result in its strategy, the Government adopted an ‘exposure reduction’ approach for PM_{2.5} to seek a more efficient way of achieving further reductions in the health effects of air pollution. This is intended to provide a driver to improve air quality everywhere in the UK rather than just in a small number of localised hotspot areas.

The exposure reduction approach is based on the principle that for a pollutant with a low or no threshold for adverse effects, it will generally be more beneficial to public health, and potentially more cost-effective to reduce pollutant levels across the whole population of an urban area or region rather than in a small area or “hotspot”. The framework of delivering this approach contains two inseparable parts:

- Air quality objectives/limit values (often called “backstop objective” or “concentration cap”) to ensure some basic level or quality of air which all citizens should experience, embodying the “environmental justice” concept
- An objective based on reducing average exposures across the most heavily populated areas of the country (often called “percentage reduction” or “exposure reduction” objective), to generate further cost effective public health improvements over and above the basic level of protection generated by the objective above.

While the percentage reduction objective is a relative measure of improvement (in this strategy, it is a 15 per cent reduction in average concentrations in urban background areas across the UK between 2010 and 2020), the backstop objective (or concentration cap) is designed to deliver a minimum level of protection applicable to all areas i.e. 25µg m⁻³ as an annual mean.

The above results for the Tower Hamlets site were obtained using an FDMS instrument; thus the results for the FDMS instrument meet the equivalence criteria (as for PM₁₀). The measurement results for all years indicate that the backstop objective was not exceeded, with annual mean concentrations between 15 and 19 µg m⁻³.

2.2.5 Summary of Compliance with AQS Objectives

The Tower Hamlets Council has examined the results from monitoring across the Borough. Concentrations are (or have been recently) above the objectives for annual mean nitrogen dioxide, plus daily mean PM₁₀ within the designated Borough wide AQMA.

Recent monitoring has shown that concentrations of sulphur dioxide and carbon monoxide do not exceed the relevant objectives within the Borough.

As a result of these findings there is no need to proceed to a Detailed Assessment based on monitoring.

(Note - The results for ozone and PM_{2.5} are provided for information purposes.)

3 Road Traffic Sources

The focus of attention for road traffic sources is on those relevant locations close to busy roads, especially in congested areas and near to junctions, where traffic emissions are higher, and in built up areas where the road is canyon like and buildings restrict the dispersion and dilution of pollutants. Only those locations, which have not been assessed during the earlier rounds or where there has been a change or new development, are assessed.

The London Atmospheric Emissions Inventory (LAEI) has been used to identify changed flows and as reported earlier the Council previously designated the whole of the Borough as an AQMA for NO₂ and PM₁₀ only.

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Concentrations are often higher where traffic is slow moving, with stop/start driving, and where buildings on either side reduce dispersion. Screening models so far have not proved helpful at identifying potential exceedences, which have only been identified by monitoring. This assessment is for NO₂ only.

Previous Review and Assessments undertaken by the Council investigated the presence of narrow roads with residential properties close to the kerb. The TG09 guidance requires the identification of residential properties within 2 m of the kerb. The roads previously identified are all within the Council's AQMA and this situation has not changed.

The Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

These include some street locations where individuals may regularly spend 1-hour or more, for example, streets with many shops and streets with outdoor cafes and bars, close to road traffic where there may be high concentrations of NO₂. (Note - those people that are occupationally exposed are not included, as they are not covered by the regulations). The assessment is for NO₂ only.

Busy streets where people may spend an hour or more close to traffic were examined in previous assessments. There has been no change to the previous findings since then and no new roads have been constructed with traffic flows greater than 10,000 vehicles per day in the Council's area.

The Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

These include street locations in the Borough where traffic flows are not necessarily high (i.e. fewer than 20,000 vehicles per day) but where there are an unusually high proportion of buses and/or HGVs. The assessment is for both NO₂ and PM₁₀ and is dependent on the proximity of relevant exposure within 10 m of the kerbside. The Council in earlier Review and Assessments identified those roads within the Borough with high flows of heavy-duty vehicles. No new roads relevant to this section have been identified in the Borough.

The Council confirms that there are no new/ newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Air pollutant concentrations are usually higher close to junctions, due to the combined impact of traffic emissions on roads forming the junction, and to the higher emissions due to stop start driving. The assessment is for both NO₂ and PM₁₀ and is dependent on the proximity of relevant exposure within 10 m of the kerbside.

There is no change to the previously reported situation concerning junctions and no new or newly identified junctions with relevant exposure within 10 m.

The Council confirms that there are no new/ newly identified busy junctions/ busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

The approach to considering new roads depends on whether or not an assessment was carried out in advance of building the new road. The assessment is for both NO₂ and PM₁₀ and is dependent on the proximity of relevant exposure within 10 m of the kerbside.

There have been no new or proposed roads in the Borough where an air quality assessment was required.

The Council confirms that there are no new/ proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Only roads with significantly changed traffic flows that have not already been considered above were investigated. The assessment is for both NO₂ and PM₁₀. A comparison of traffic flows from the London Atmospheric Emissions Inventory confirms that there are no new roads with significantly changed traffic flows.

The Council confirms that there are no new/ newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

This section only applies to bus stations or sections of bus stations that are not enclosed, and where there is relevant exposure, including at nearby residential properties. The assessment is for both the annual mean and the 1-hour NO₂ objectives. (Note - the term “bus” in this instance is used to signify both buses and coaches).

Bus stations in Borough were examined in previous USAs and found not to require further investigation. Based on the TG09 guidance if such sources were previously considered and are within an existing AQMA there is no need to proceed further.

The Council confirms that there are no new relevant bus stations in the Borough.

4 Other Transport Sources

4.1 Airports

Aircraft are potentially significant sources of nitrogen oxides (NO_x) emissions, especially during take-off. The TG09 guidance used new information, which has resulted in the criteria to trigger a Detailed Assessment being relaxed, while the requirement to assess PM₁₀ has been removed. Thus this section only applies to NO₂. (Note – any road traffic using airports was considered in the previous section.) The nearest airport, City Airport, is outside the Borough, in neighbouring Newham. It is thus sufficiently distant not to be relevant.

The Council confirms that there are no airports in the Borough.

4.2 Railways (Diesel and Steam Trains)

Stationary locomotives, both diesel and coal fired, can give rise to high levels of sulphur dioxide (SO₂) close to the point of emission. Recent evidence also suggests that moving diesel locomotives, in sufficient numbers, can also give rise to high NO₂ concentrations close to the track where, along busy lines, emissions can be equivalent to those from a busy road.

4.2.1 Stationary Trains

Previous rounds of Review and Assessment also found that there are no areas within the Borough where diesel or steam locomotives are stationary for periods of 15 minutes or more and within 15 m of locations where regular outdoor exposure arises. This situation has not changed.

The Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Diesel locomotives use rail lines that run through the Borough, however these are not included within the list of lines (from Table 5.1 of TG09), which identify those with a “high” usage of diesel locomotives.

The Council confirms that there are no locations with a large number of movements of diesel locomotives and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

The assessment for shipping needs to consider SO₂ only. Part of Borough aligns the river Thames and although there are some boat movements in this area they are not sufficient to require further investigation based on the TG09 guidance.

The Council confirms that there are no ports within the Borough or shipping that meets the specified criteria.

5 Industrial Sources

5.1 Industrial Installations

The Council and the Environment Agency (EA) control industrial and other sources within the Borough under the Environmental Permitting Regulations (England and Wales) 2010, as amended. The Council also has control over some smaller industrial and commercial sources, largely through the Clean Air Act, with its associated control of the stack heights. As a result of these controls, there are relatively few sources that may be relevant under the Local Air Quality Management (LAQM) regime. Many of these sources were also addressed during previous rounds of Review and Assessment. The focus is thus on new installations and those with significantly changed emissions.

Industrial sources are considered unlikely to make a significant local contribution to annual mean concentrations, but could be significant in terms of the short-term objectives in the Borough. Sources in neighbouring authorities and the combined impact of several sources are considered. The approach used is based on use of the planning and permitting processes. The assessment considers all the LAQM pollutants, including those most at risk of requiring further work (SO₂, NO₂, PM₁₀ and benzene).

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

Since the last round of Review and Assessment there have been no applications received for installations where an Air Quality Assessment has been carried out.

The Council has assessed new/ proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Lists of existing Part B installations that are regulated under the Environmental Permitting regime are provided in the Appendices. These are all processes with low emissions of LAQM pollutants. None of these have increased emissions by greater than 30% (as referred to in the TG09 guidance) and no new relevant exposure has been introduced nearby. There are no Part A or A2 installations in the Borough.

The Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

Since the last round of Review and Assessment the Council has received no applications for new installations. No other applications have been received for new or proposed sources where it has been determined that the installation is likely to give rise significant pollutant emissions.

The Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

This was previously assessed in earlier rounds of Review and Assessment and it was found that there are no major petrol storage depots in the Borough. This situation has not changed.

There are no major fuel (petrol) storage depots within the Borough.

5.3 Petrol Stations

There is some evidence that petrol stations could emit sufficient benzene to put the 2010 objective at risk of being exceeded, especially if combined with higher levels from nearby busy roads. Some sites in the Borough have however already incorporated petrol vapour recovery (PVR) systems, furthermore those service stations with petrol sales above 3.5 million litres per annum were required to install Stage 2 PVR systems before the 1st January 2010 deadline to comply with UK legislation to reduce petrol vapour (and benzene) from vehicles.

Previous rounds of Review and Assessment assessed all petrol stations for a throughput of more than 2000 m³ of petrol, and a busy road nearby. None were found to have relevant exposure within 10m of the pumps and therefore it was not necessary to go to a Detailed Assessment. There has been no change in this situation for this round.

The Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Some local authorities in England have identified potential exceedences of the PM₁₀ objectives associated with emissions from poultry farms (defined as chickens (laying hens and broilers), turkeys, ducks and guinea fowl). These relate to large farms (> 100,000 birds) that are regulated by the EA. None however exist within the Council's area.

The Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

Biomass burning can lead to an increase in PM₁₀ emissions, from the combustion process itself and also by aerosol formation from the volatile materials distilled from the wood. Compared to conventional gas burning, biomass burning can also result in an increase in NO_x emissions due to the fuel-derived portion that is not present in gas combustion.

The Borough is a 'Smoke Control Area', meaning that the emission of smoke from chimneys of domestic premises and other buildings in the area is not permitted. Furthermore furnaces, chimneys and industrial processes are monitored carefully and only authorised appliances (as listed under the Smoke Control Area Orders) can be used to burn solid fuels such as coal, coke and wood.

6.1 Biomass Combustion – Individual Installations

The use of biomass to generate energy has potentially significant benefits for the reduction of greenhouse gas emissions. However there are concerns that an increase in biomass combustion in urbanised areas could be detrimental to air quality, particularly with respect to PM₁₀ and NO₂. The TG09 guidance includes a procedure to determine the impact of biomass combustion plant to see if there is the potential for the air quality objectives to be exceeded.

Following this the Council has assessed for individual combustion plant burning biomass ranging from 20 MW down to 50 kW units and no new plant have been identified that have not previously been considered.

The Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

As already outlined the Borough is a Smoke Control Area and therefore any biomass burning using non-authorised appliances is considered minimal. There is however the potential that many small biomass combustion installations (including domestic solid-fuel burning), whilst individually acceptable, could in combination lead to unacceptably high PM₁₀ concentrations, particularly in areas where PM₁₀ concentrations are close to or above the objectives. The impact of domestic biomass combustion in most areas is thought to be small at the time of writing, but could become more important in future. The potential for combined impacts, other than that discussed above, will be assessed should future plant be proposed. Currently there is minimal domestic solid fuel burning as discussed in the next section.

The Council has assessed the combined impact of biomass combustion, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

The previous rounds of Review and Assessment identified areas where domestic solid fuel burning gives rise to exceedences of the objective for SO₂. PM₁₀ from domestic solid fuel burning was also covered above.

The Borough is designated a Smoke Control Area and there are no areas of significant domestic solid fuel use in the Borough. This position has not changed from the previous USA, which confirmed that no areas of significant domestic solid fuel burning were identified. Gas is widely available in the Borough and it remains the predominant fuel used for domestic water and space heating.

The Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Dust emissions from uncontrolled and fugitive sources can give rise to elevated PM₁₀ concentrations. These sources can include, but are not limited to the following sites: quarrying and mineral extraction sites, landfill sites, coal and material stockyards, or materials handling, major construction works and waste management sites. Dust can arise from the passage of vehicles over unpaved ground and along public roads that have been affected by dust and dirt tracked out from dusty sites. Other sources of dust are from the handling of dusty materials, the cutting of concrete, etc and wind-blown dust from stockpiles and dusty surfaces.

The Environment Agency permits 6 sites for waste handling (see Appendix 2); none of these however are the cause of complaint regarding dust and other fugitive emissions.

No other additional fugitive and uncontrolled particulate matter emissions have been identified based on local professional knowledge, recent air quality assessments or recent complaints to the Council.

The Council confirms that there are no additional potential sources of fugitive particulate matter emissions in the Borough.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring within the Borough confirmed that the annual mean nitrogen dioxide objective continues to be exceeded at roadside and background locations. The Council monitors 3 locations continuously across the Borough. The sites monitored are considered to represent relevant exposure. The roadside (TH2 and TH4) sites exceeded the annual mean objective by a large margin.

The Council's PM₁₀ monitoring indicates that the daily mean objective has been border-line with the objective in recent years within the Borough at the roadside (TH4) site. Other sites within the Borough have met the objectives. An analysis of trends in London (KCL, 2012) indicated that concentrations do not appear to be reducing and there was also evidence to indicate close to roadsides PM₁₀ from primary sources may be increasing.

The monitoring of sulphur dioxide and carbon monoxide confirms that the objectives for these pollutants have been met.

Based on the findings from monitoring in the Borough, the Council, having previously designated the Borough as an Air Quality Management Area for NO₂ and PM₁₀, does not need to undertake a Detailed Assessment as no new potential or actual exceedences at relevant locations were established.

8.2 Conclusions from Assessment of Sources

The Council has assessed the likely impacts of local developments for road transport, other transport, industrial processes, commercial/domestic, fugitive emissions, plus residential and commercial sources. The findings have indicated that there are no new changes that require the Council to undertake a Detailed Assessment.

8.3 Proposed Actions

This report follows the technical guidance (TG09) produced for this round of Review and Assessment. It therefore fulfils this part of the continuing LAQM process.

The results, from following this methodology, are that the Council has not identified an additional risk of the air quality objectives for the LAQM pollutants: carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide, being exceeded anywhere in the Council's area. Thus the Council need not proceed beyond the updating and screening assessment for these pollutants. For nitrogen dioxide and particles (PM₁₀) the Council has previously designated the Borough as an AQMA. The findings from this report indicate that the AQMA should be maintained.

The Council will therefore undertake the following actions:

1. Undertake consultation on the findings arising from this report with the statutory and other consultees as required.
2. Maintain the existing monitoring programme.
3. Continue with the implementation of its Air Quality Action Plan in pursuit of the AQS objectives.
4. Prepare for the submission of its next Air Quality report.

9 References

Defra, 2007. Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volume 1). Defra, London. Cm 7169.

Defra, 2009a. Local Air Quality Management, Technical guidance LAQM.TG09. Defra, London.

KCL, 2012. Air Quality in London GLA Health and Environment briefing note. KCL July 2012.

Appendices

Appendix 1: Part B installations in Tower Hamlets

Appendix 2: Environment Agency permitted waste installations in Tower Hamlets

Appendix 1: Part B installations in Tower Hamlets

Table 9.1 List of Part B processes in the Council's area

PG Note	Company Name	Site Address/ Home Address of Mobile Plant
PG6/34 Respraying of Road Vehicles	KPM Taxis	Hemming House, Hemming Street, London, E1 5BL
PG3/1 Bulk Cement	London Concrete Ltd	Bow Plant, Wick Lane, Bow, London, E3
PG3/16 Mobile Crushing and Screening	McGrath Bros (mobile)	Wansbeck Road, London, E9 5HW
PG3/16 Mobile Crushing and Screening	McGrath Bros (own site)	Wansbeck Road, London, E9 5HW
PG3/1 Bulk Cement	Modern Mix Concrete	Unit 1, Lusty Industrial Estate, Empson Street, London, E3 3LT
PG3/1 Bulk Cement	J B Riney & Co. Ltd	End Malverton Road, London E3 2JE
PG3/1 Bulk Cement	Gavigan Paving Ltd	London House, 120 Bow Common Lane, London, E3 4BH
PG3/1 Bulk Cement	Cemex South East	477 The Highway, Stepney, London, E1 9HN

Table 9.2 List of permitted petrol stations in the Council's area

Company Name	Site Address
ASDA Stores Limited	Asda Petrol Station, 151 East Ferry Road, London E14 3BT
BP Oil UK Limited (Express Shopping)	Museum Service Station, 319-329 Cambridge Heath Road, London E2 9LH
BP Oil UK Limited (Express Shopping)	BP Tower Connect The Highway Service Station, 102-106 The Highway, London E1 9BU
Cotton Street Service Station	Star Cotton Street Service Station, 40 Cotton Street, London E14 0AJ
Plaistow Broadway Filling Stations Limited	Burdett Road Filling Station, 222 St Pauls Way, London E3 4AR
Plaistow Broadway Filling Stations Limited	Grove Road Filling Station, 51-53 Grove Road, London E3 4PE
ROC UK Limited	Orchard Wharf Service Station, Leamouth Road, London E14 0JG
Shell UK Ltd	Shell Old Ford Service Station, 445-453 Wick Lane, London E3 2TB
Shell UK Ltd	Shell Whitechapel Service Station, 139-149 Whitechapel Road, London E1 1DT
Tesco Stores Limited	Tesco Filling Station, Hancock Road, London E3 3DA
The Co-operative Food	Co-op Bow Road Service Station, 127-139 Bow Road, London E3 2AN
The Co-operative Food	Somerfield St Katherines Service Station, 77-101 The Highway, London E1 9BN
Vallance Service Station	Vallance Service Station, 112 Vallance Road, Bethnal Green, London E1 5BW

Table 9.3 List of permitted dry cleaners in the Council's area

Company Name
A Fresh Start Dry Cleaning
Amigos Dry Cleaning
Attaboy Dry Cleaners
Bright Clean
Champers Dry Cleaners
Diamond Tailors & Dry Cleaners
E3 Dry Cleaners
Five Star Dry Cleaning
Gold Star Dry Cleaners
Kemps Dry Cleaning
Milligan Street Trading
Nazal Dry Cleaners
Professional Dry Cleaners
Quality Dry Cleaners
Royal Deluxe Dry Cleaners
Royal Dry Cleaners
Smarty Pants Dry Cleaners
Soleil Dry Cleaners
Spitalfields Dry Cleaners
Spotless Dry Cleaners
State Express Cleaners & Launderette
E1 Dry Cleaners Ltd
River Dry Cleaners Ltd

Appendix 2: Environment Agency permitted waste installations in Tower Hamlets

Table 9.4 Environment Agency permitted waste installations in Tower Hamlets

Permission no.	Company Name	Site Address
EP3235GK	Morgan Property Development Company Ltd	Riverside South Energy Centre, Riverside South, Canary Wharf
XP3330GR	Cofely East London Energy Ltd	Kings Yard Energy Centre, Carpenters Lane