2015 Updating and Screening Assessment for London Borough of Sutton

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

June 2015

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London Borough of Sutton

Updating And Screening Assessment 2015

Bureau Veritas Air Quality

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Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Updating and Screening Assessment (USA) is a requirement of the Sixth Round of Review and Assessment for all local authorities. The Report has been undertaken in accordance with the Technical Guidance LAQM.TG(09) and associated tools.

This report considers monitoring data from 2014, assessing this against the Air Quality Strategy (AQS) objectives. It also considers any potential new pollutant emission sources that may have an impact on local air quality.

Exceedences of the annual mean Nitrogen Dioxide (NO_2) AQS objective were monitored at automatic kerbside sites ST4 - Wallington and ST6 - Worcester Park and roadside non-automatic sites ST33, ST34 and ST40.

There were no further exceedences of any of the AQS objectives although it is expected that the hourly mean NO_2 objective would have been exceeded at ST4 - Wallington had there been higher data capture.

Following a review of new emissions sources, all significant developments had conducted screening or detailed assessment as part of their planning condition. All of these concluded that the development would have an insignificant impact on air quality. However, it should be noted that all are subject to mitigation and regulation measures, which must be adhered to if compliance is to be achieved.

Exceedences have been identified which have been previously declared against and these are mainly a result of transport sources. Considering this together with proposed new developments in the borough, it is recommended that the borough wide AQMA declared for both NO_2 and PM_{10} objectives should remain. Following the 2015 Updated Screening Assessment, there is no need to proceed to Detailed Assessment. However, it is recommended that the London Borough of Sutton:

- Consider conducting an NO_2 co-location study, commencing in 2016, for the derivation of a local bias adjustment factor
- Continue with the currently implemented AQMAs and Action Plan

- Continue to monitor planning submissions for any new industrial installations which have the potential to impact on air quality
- Monitor the impact of the proposed installations noted in this report, particularly Beddington Farmlands, post operation, with particular focus on implementation of suggested mitigation measures
- Proceed to the 2016 Progress Report

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1 Introduction

1.1 Description of Local Authority Area

The London Borough of Sutton is situated in the south of London. It is an outer London Borough comprising a population of just over 190,000 according to the 2011 census. The borough includes the following areas: Beddington, Carshalton, Cheam, Hackbridge, Sutton, Wallington and Worcester Park. Sutton is one of the major metropolitan centres identified in the London Plan. The borough is mostly suburban and therefore relatively affluent, although with variations in economic well-being across the borough. The main public transport used in the borough is local rail from the various regional stations and local buses, with good access to Central London. There are small pockets of industry in the borough, particularly in Beddington, close to the boundaries with Merton and Croydon. This area contains a number of waste transfer sites and has been identified by the South London Waste Partnership as the most suitable location for siting an Energy Recovery Facility to handle up to 215,000 tonnes of waste. The main roads that run through the Borough include the A217, A24, A232, and A2043. The main sources of air pollutants are the busy and congested roads. Currently, there are no Part A installations in the borough and the Part B industrial and other minor processes that are regulated by the Council are mostly small scale.

During previous rounds of Review and Assessment, areas of exceedence of the Air Quality Objectives were identified and each declared as Air Quality Management Areas (AQMAs). Owing to measured and modeled exceedences of the annual mean and 1-hour mean objectives for NO_2 and the annual mean and 24-hour mean objectives for $PM_{10,}$ the areas were consolidated in June 2013 in order that the whole of the London Borough of Sutton was designated as an AQMA for both NO_2 and PM_{10}.

1.2 Purpose of Report

This report fulfills 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 micrograms per cubic metre µg/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 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/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 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005

Particles (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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 following review is adapted from the 2014 APR[1], created by Bureau Veritas on behalf of London Borough of Sutton.

First Round of Review and Assessment

London Borough of Sutton declared its first Air Quality Management Area (AQMA) along the majority of the main roads in the Borough in March 2001 following the Stage 3 Review and Assessment for PM_{10} and NO_2. This found that the main issue with respect to local air quality was emissions from road vehicles, leading to predictions that the NO_2 and PM_{10} air quality objectives would be exceeded. The findings for the other five LAQM pollutants were that the relevant objectives were likely to be met and therefore an AQMA for these was not needed.

Second Round of Review and Assessment

In August 2003 the Council carried out a Stage 4 Review and Assessment of air quality in the Borough. The results of the Stage 4 Review and Assessment confirmed the findings of the Stage 3 report and that the Council would not meet the air quality objective requirements for annual mean NO_2 and 24-hour PM_{10}. Consequently, the AQMA was extended in 2004 to include some additional roads where objectives would also not be met. A map showing the extent of that AQMA can be found in the previous reports.

[1] Bureau Veritas (2014) London Borough of Sutton LAQM Progress Report 2014

Third Round of Review and Assessment

The third round Updating and Screening Assessment (USA), completed in June 2006, found that PM_{10} concentrations continued to exceed the annual mean objective where there was relevant exposure within the existing AQMA. For NO_2 it was found that levels at three of the diffusion tube sites would not meet the air quality objective. Therefore a Detailed Assessment would be needed.

A source apportionment study using data from Sutton 5, Beddington Lane, was carried out in 2007 and highlighted a number of issues relating to the levels and potential sources of PM_{10} in that area.

Fourth Round of Review and Assessment

Updated monitoring in the 2009 Updating and Screening Assessment USA confirmed that the annual mean NO_2 objective had been widely exceeded at roadside locations across the Borough. The PM_{10} monitoring in 2008 indicated that the 24-hour mean objective had been exceeded at the ST5 site. Other sites within the Borough had met the objectives. Those results indicated that the existing AQMA should be retained.

Based on these findings from the previous rounds of Review and Assessment and the monitoring data from ST5, a further AQMA was declared in 2010 to cover Beddington Lane and premises alongside.

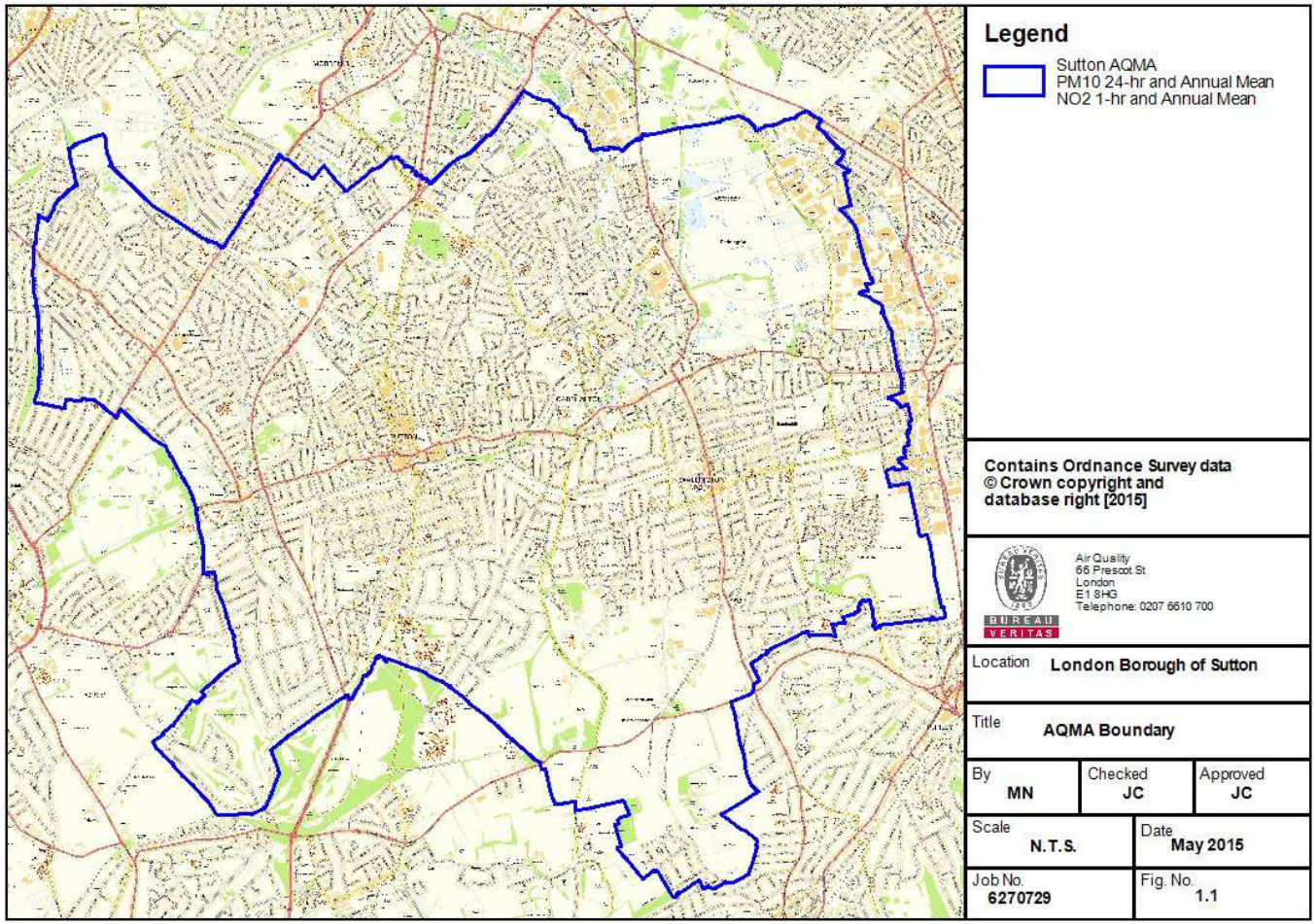
Following the declaration of the expanded AQMA in 2010, additional automatic monitoring was carried out in Beddington Lane and a network of indicative monitors for nitrogen dioxide was set up across the borough. Based on the results from the additional monitoring and, in order to consolidate the previously declared AQMAs, it was decided in 2013 to declare the whole Borough as an AQMA and previous orders were revoked.

Fifth Round of Review and Assessment

This round of assessment was largely covered by the APR submitted in 2014. The 2014 APR did not identify any new emissions sources. Exceedences of the NO_2 hourly and annual mean objectives were observed in 2013. Both the 24 hour and annual mean objectives were met for PM_{10} between 2009-2013.

The continued compliance with the Benzene AQS objective was identified, which was used as justification for the council to cease monitoring of this pollutant in 2012.

Figure 1.1 - Map of AQMA Boundary



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

This section provides details of monitoring carried out in 2014, the year covered by this report.

2.1.1 Automatic Monitoring Sites

Sutton Borough Council operated five automatic monitoring stations in 2014:

- two kerbside sites: ST4 Sutton – Wallington and ST6 Sutton - Worcester Park, both measuring NO_2 and PM_{10};
- two industrial sites: ST8 Sutton - Beddington Lane and Site ST5 Sutton - Beddington Lane (north) both measuring NO_2 and PM_{10}; and
- one was a suburban background site: ST3 Sutton Carshalton measuring NO_2 and ozone.

Site ST5 Sutton - Beddington Lane (north) was operational from 2005 until 2012, when it was relocated to site ST8. The movement of the monitoring instruments was to gather data on what was considered to represent the worst-case location in relation to a specific emission source. The site of the emission source has temporarily closed and monitoring re-commenced at ST5, in its original location in July 2014, following the recommendation in the 2014 APR. The site ST7 was in place only for a period of 2 years while funding was available. Furthermore, as site ST8 was placed only 300m to the west, there was no need to continue monitoring at ST7.

Further details of these monitoring stations are provided in Table 2.1 and the locations are shown in Figure 2.1

Figure 2.1 - Map of Automatic Monitoring Sites

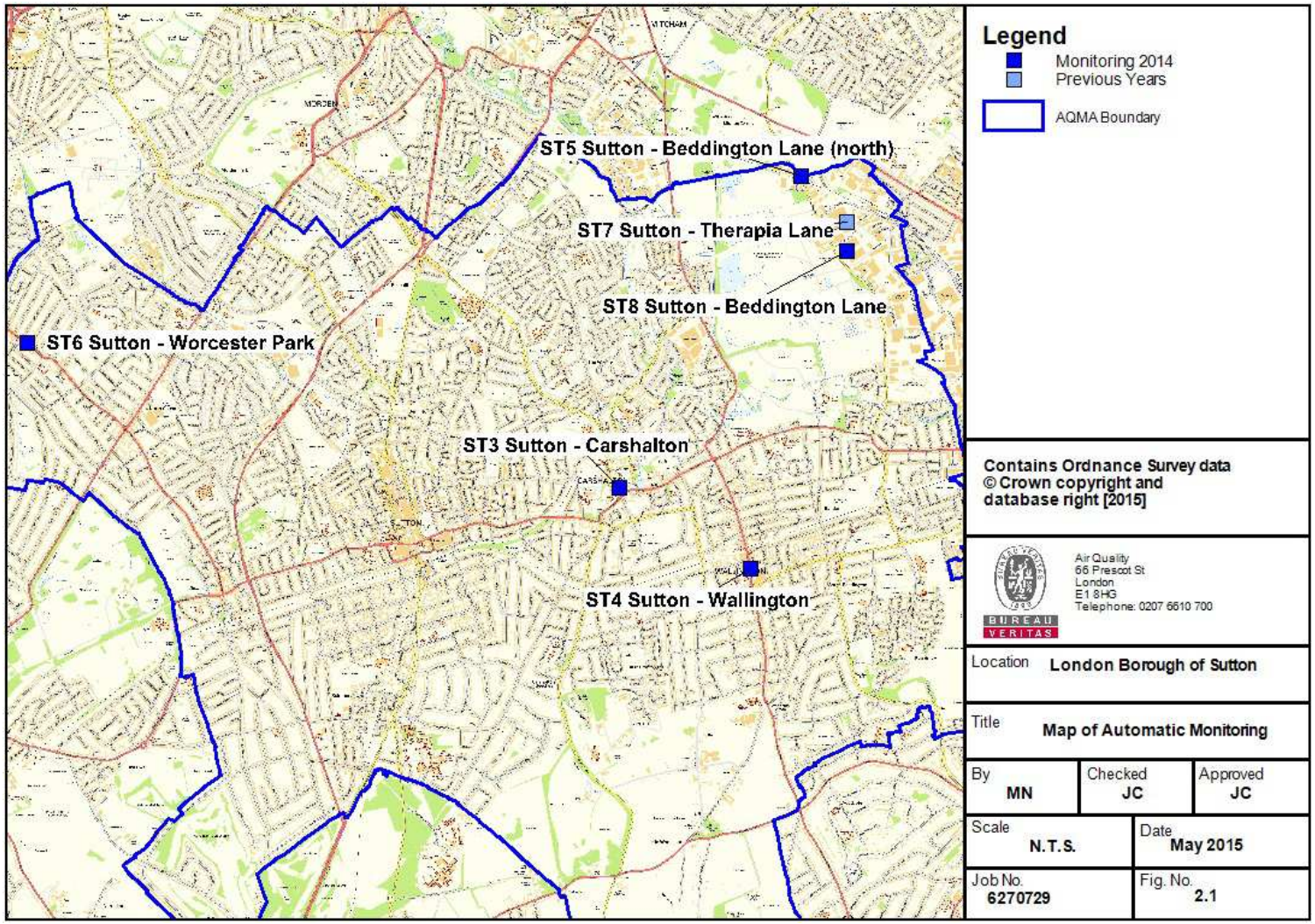


Table 2.1 - Details of Automatic Monitoring Sites

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?
ST3 - Carshalton	Suburban Background	527776	164513	NO_2, O_3	Y	Chemiluminescence, UV Photometric	N/A**	50	N
ST4 - Wallington	Kerbside	528925	163804	NO_2, PM_{10}	Y	Chemiluminescence, TEOM	Y (2m)	0.8	Y
ST6 - Worcester Park	Kerbside	522557	165787	NO_2, PM_{10}	Y	Chemiluminescence, TEOM/FDMS	Y (2m)	1.3	Y
ST8 - Beddington Lane	Industrial	529781	166597	NO_2, PM_{10}	Y	Chemiluminescence, TEOM	N	N/A	N
ST5* - Beddington Lane (north)	Industrial	529400	167224	NO_2, PM_{10}, $PM_{2.5}$	Y	Chemiluminescence, BAM	N	4.5m	N

* Site re-commenced operation July 2014
** Background site representative of residential exposure in the area.

2.1.2 Non-Automatic Monitoring Sites

Sutton Council undertook monitoring at twenty two locations in 2014, an increase of four additional sites from the previous year. The new sites were as follows:

- ST09 - All Saints Primary
- ST10 - Muschamp Primary;
- ST11 - Sherwood Park School; and
- ST34 - Oakhill Road.

ST38 has been re-located, and is renamed ST38A. The site was moved from the previous location at Devonshire Primary School, Belmont to Brighton Road, Sutton.

Other locations monitored primarily include schools and residential properties.

Figure 2.2 - Map of Non-Automatic Monitoring Sites

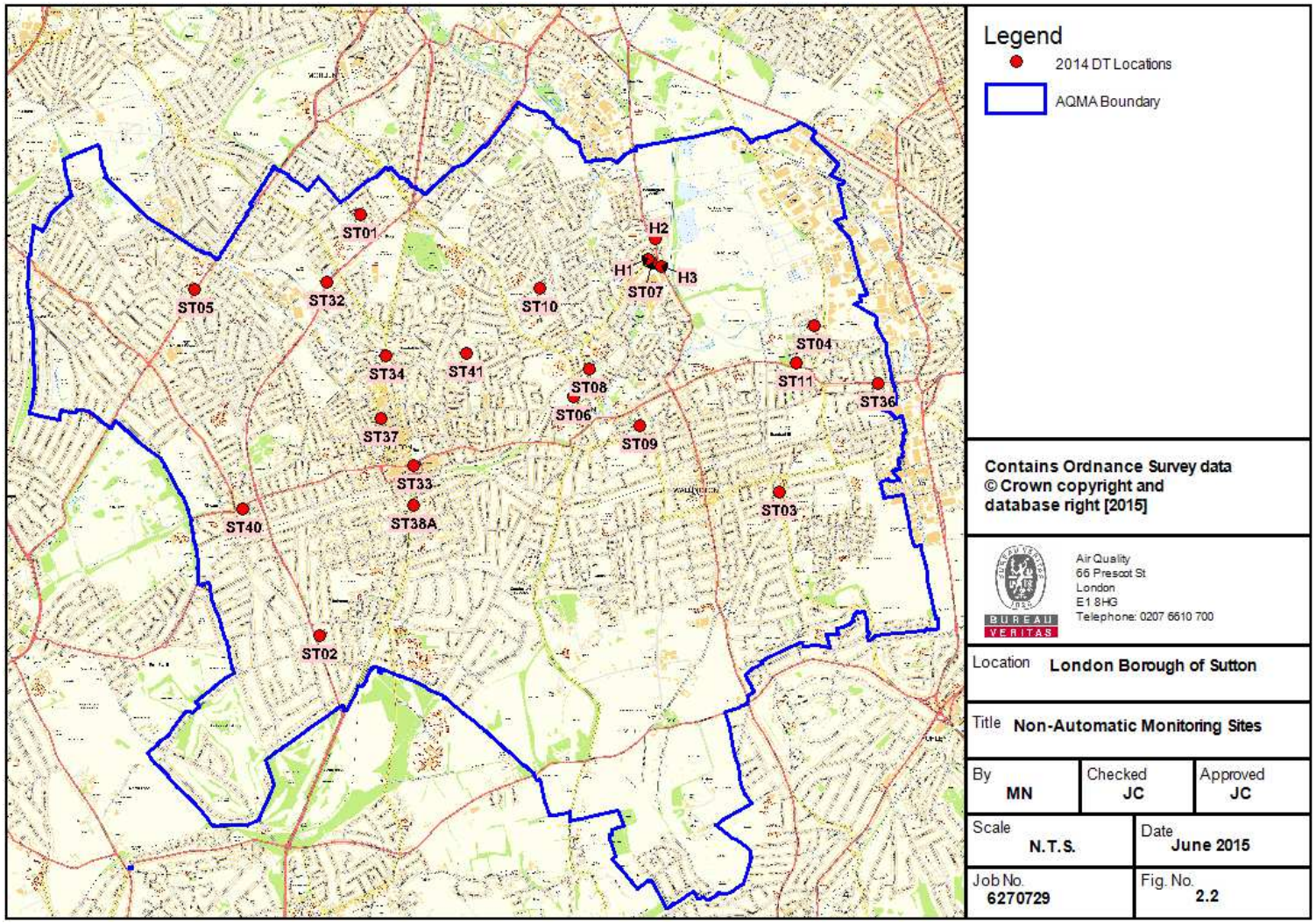


Table 2.2 - Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
ST01 - Abbey Primary School	Urban background	525516	166514	NO_2	Y	N	Y - 10	15	N
ST02 - Avenue Primary School	Urban background	525112	162349	NO_2	Y	N	Y - 0	25	Y
ST03 - Bandon Hill Primary	Urban background	529667	163769	NO_2	Y	N	Y - 20	55	N
ST04 - Beddington Park Primary	Urban background	530012	165420	NO_2	Y	N	Y - 4	28	N
ST05 - St Cecilia's Primary	Urban background	523874	165778	NO_2	Y	N	Y – 2	24	Y
ST06 - St Mary's Infants School	Urban background	527627	164714	NO_2	Y	N	Y – 5	46	N
ST07 - Hackbridge Primary	Urban background	528401	166038	NO_2	Y	N	Y - 0	56	N
ST08 - Victor Seymour	Urban background	527788	164982	NO_2	Y	N	Y - 0	33	N
ST09 - All Saints Primary	Urban background	528287	164432	NO_2	Y	N	Y - 0	35	N
ST10 - Muschamp Priory	Urban background	527299	165789	NO_2	Y	N	Y - 0	20	N
ST11 - Sherwood Park School	Urban background	529835	165041	NO_2	Y	N	Y-0	35	Y
ST32 - Alcorn Close	Urban background	525184	165845	NO_2	Y	N	N	25	N
ST33 - Carshalton Rd	Roadside	526048	164032	NO_2	Y	N	Y - 3	1	Y
ST34 - Oakhill Road	Roadside	525772	165118	NO_2	Y	N	Y-10	1	Y
ST36 - Croydon Rd, Beddington	Roadside	530645	164839	NO_2	Y	N	Y - 0	11	Y
ST37 - St Nicholas Way	Roadside	525718	164497	NO_2	Y	N	Y - 8	6	N
ST38A* - Brighton Road, Sutton	Roadside	526046	163636	NO_2	Y	N	Y - 2	10	N

Site Name	**Site Type**	**X OS Grid Ref**	**Y OS Grid Ref**	**Pollutants Monitored**	**In AQMA?**	**Is monitoring collocated with a Continuous Analyser (Y/N)**	**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?**
ST41 - Benhill Road Allotments	Urban background	526569	165146	NO_2	Y	N	N	46	N
H1 - Hackbridge Road	Roadside	528373	166077	NO_2	Y	N	Y- 0.5	17	N
H2 - Clover Way	Urban background	528437	166275	NO_2	Y	N	Y - 0	25	Y
H3 - 57 London Rd	Roadside	528499	166004	NO_2	Y	N	Y - 0	5	Y

* Site moved from previous location Devonshire Primary School, Belmont

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

There are two Air Quality Objectives for NO_2, namely:

- the annual mean of 40µg/m^3, and
- the 1-hour mean of 200µg/m^3 not to be exceeded more than 18 times a year.

Automatic Monitoring Data

The Council monitored NO_2 at five locations in 2014;

- ST3 Sutton – Carshalton;
- ST4 Sutton – Wallington;
- ST5 Sutton – Beddington Lane North;
- ST6 Sutton - Worcester Park; and
- ST8 Sutton - Beddington Lane.

The monitoring data can be seen in Table 2.3 and Table 2.4 below. Full details of the QA/QC procedure are provided in Appendix A.

The data were fully ratified at time of writing, with the exception of the latter half of the ST3 Carshalton data set, which should be treated with caution.

Annualisation (short to long term data adjustment) was applied to data capture below 75%. Details of the annualisation are provided in Appendix A. Where data capture was below 90% the 99.8th percentile has also been reported for the hourly objective.

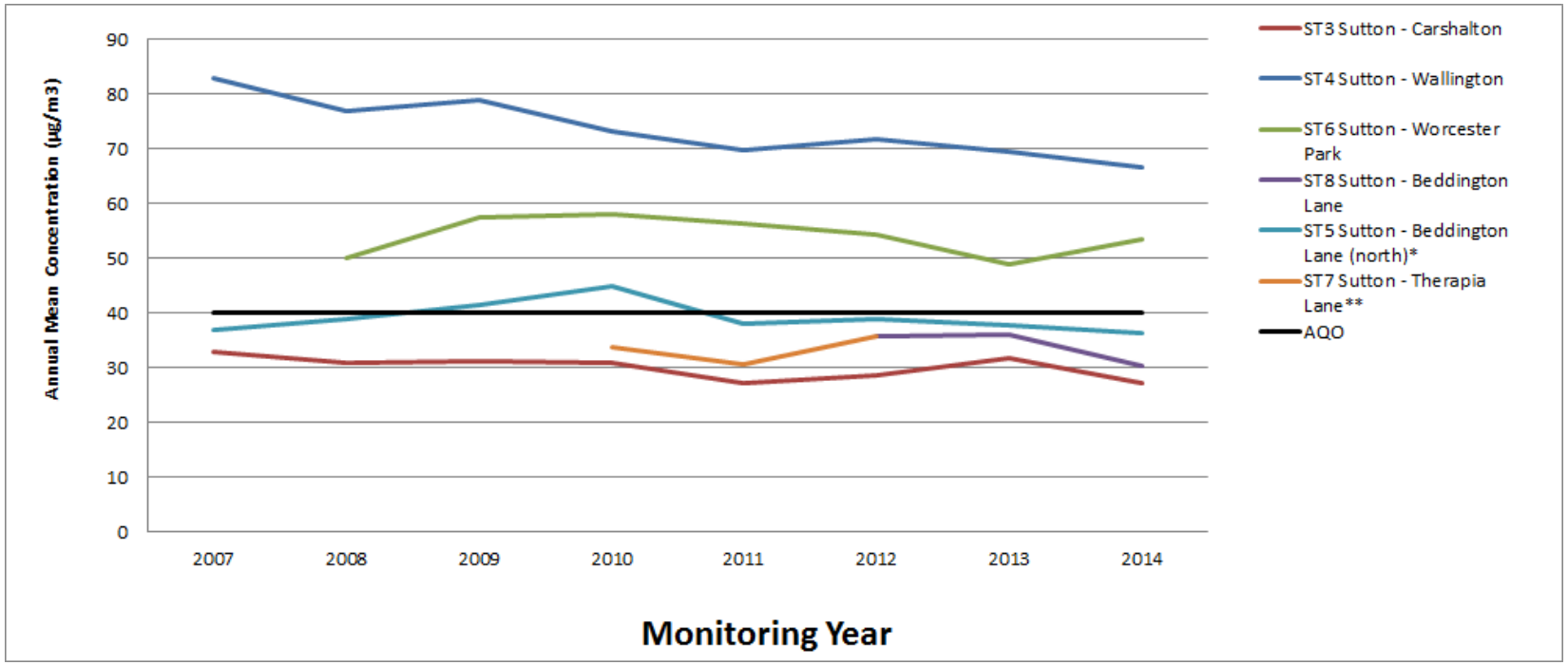
Table 2.3 - Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2014 % [b]	Annual Mean Concentration µg/m^3 / (Data Capture %)				
					2010* [c]	2011* [c]	2012* [c]	2013* [c]	2014 [c]
ST3	Suburban Background	Y	74.3	74.3	30.9 (94%)	27.2 (79%)	28.7 (87%)	31.7[c] (74%)	27.3[c] (74%)
ST4	Kerbside	Y	94.7	20.5	**73.3** (99%)	**69.7**[c] (60%)	**71.8** (95%)	**69.6**[c]	**66.6**[c] (20.5%)
ST6	Kerbside	Y	99	99	**58.0** (99%)	**56.5** (99%)	**54.5** (97%)	**49.0** (99%)	**53.5** (99%)
ST8	Industrial	Y	76	76	-	-	35.7[c] (44%)	36.0 (93%)	30.5 (76%)
ST5	Industrial	Y	96.7	42.8	**45.0** (85%)	38.2 (99%)	39.0[c] (17%)	-	36.4[c] (42.8%)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. 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] Results "annualised" following methodology in Box 3.2 of TG(09)
*Annual mean concentrations for previous years are optional.

In **bold**, exceedence of the NO_2 annual mean AQS objective of 40 µg/m^3
Underlined, result over 60 µg/m^3

Figure 2.3 - Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites



* 2013 value for ST5 Beddington Lane North not available, trend line between 2012 and 2014 presented
** Monitoring at ST7 Therapia Lane discontinued

Figure 2.3 shows the trend in annual mean NO_2 concentrations at the continuous monitoring sites between 2007 and 2014. This shows that concentrations have been on a generally downward trend, with the exception of ST6 Worcester Park which has shown marginal increase. ST4 and ST6 have exceeded the NO_2 annual mean AQS objective for all monitored years, but all other sites are compliant in 2014. ST4 Wallington has consistently monitored the highest concentrations, but has shown significantly improved concentrations since 2007 as a result of measures included in the AQAP.

Table 2.4 - 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 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]
ST3	Suburban Background	Y	74.3	74.3	0	0 (108.0)	0 (126.6)	1 (136.4)	0 (106.1)
ST4	Kerbside	Y	94.7	20.5	**72**	**47** (218.8)	**133**	**69** (248.7)	10 (227.8)
ST6	Kerbside	Y	99	99	5	10	13	8	3
ST8	Industrial	Y	76	76	-	-	0 (132.6)	9	0
ST5	Industrial	Y	96.7	42.8	2 (158.8)	0	2 (179.6)	-	0 (99.8)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. 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] If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

Diffusion Tube Monitoring Data

The NO_2 diffusion tube data are summarised in Table 2.5. The full dataset for 2014 (monthly mean values) is included in Appendix A.

Three diffusion tube monitoring sites in 2014 had data capture below 75%. Short to long term adjustment calculations (annualisation) were applied to all sites with data capture of 3 months and above. The details of the annualisation can be found in Appendix A. Three sites with data capture below 33% were not reported as the monitoring period was too short to be representative of annual exposure.

The diffusion tube results for 2014 have been adjusted using the national bias adjustment factor of 0.91; further details are provided in Appendix A.

For 2014, there were three sites where the annual mean AQS objective for NO_2 was exceeded; these were:

- ST33 – Carshalton Road;
- ST34 – Oakhill Road; and
- ST40 – High Street, Cheam.

The site ST33 Carshalton Road was close to the objective in 2013 and previous years had shown exceedences. This indicates there is still an air quality issue at the site.

ST34 is a new site, installed in September 2014. As result was annualised, it may be that the exceedence can be attributed to limited data capture, though if the exceedence is repeated in 2015 then action plan measures should be considered.

ST40 High Street, Cheam, has repeatedly shown exceedences of the annual mean objective since 2009.

In 2014, ST38 was closed and a new site, ST38A, was installed at Brighton Road/Cedar Road.

Sites H1 and H3 showed exceedence of the annual mean AQS objective in 2013. It was reported in the 2014 Annual Progress Report that this may have been due to the increased uncertainty associated with annualisation. However, H3 was within 10% of the annual mean AQS objective in 2014. Therefore, air quality in the Hackbridge area should continue to be monitored and actions taken should the future monitoring indicate that there are exceedences of the AQS objective.

There are no sites exceeding 60 µg/m^3, which would be an indication of a potential exceedence of the 1-hour NO_2 objective.

A comparison with previous results (Table 2.6 and Figure 2.4) shows that all sites in general show a decreasing trend since 2010. Concentrations in 2014 however, were generally marginally higher than in 2013.

Table 2.5 - Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91) 2014 (µg/m^3)
ST01	Abbey Primary School	Urban background	Y	N	92%	Y	N	21.2
ST02	Avenue Primary School	Urban background	Y	N	83%	Y	N	30.9
ST03	Bandon Hill Primary	Urban background	Y	N	92%	Y	N	22.5
ST04	Beddington Park Primary	Urban background	Y	N	83%	Y	N	22.2
ST05	St Cecilia's Primary	Urban background	Y	N	83%	Y	N	24.3
ST06	St Mary's Infants School	Urban background	Y	N	92%	Y	N	19.5
ST07	Hackbridge Primary	Urban background	Y	N	75%	Y	N	22.3
ST08	Victor Seymour	Urban background	Y	N	92%	Y	N	24.9
ST09	All Saints Primary	Urban background	Y	N	92%	Y	N	20.2
ST10	Muschamp Priory	Urban background	Y	N	92%	Y	N	23.0
ST11	Sherwood Park School	Urban background	Y	N	83%	Y	N	26.6
ST32	Alcorn Close	Urban background	Y	N	92%	Y	N	27.0
ST33	Carshalton Road	Roadside	Y	N	92%	Y	N	**42.8**
ST34	Oakhill Road	Roadside	Y	N	33%	Y	N	**43.8***
ST36	Croydon Rd, Beddington	Roadside	Y	N	92%	Y	N	35.9
ST37	St Nicholas Way	Roadside	Y	N	83%	Y	N	27.3
ST38A	Brighton Road, Sutton	Roadside	Y	N	58%	Y	N	38.8*

Site ID	Location	Site Type	Within AQMA ?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91) 2014 (µg/m^3)
ST40	38 High Street, Cheam	Roadside	Y	N	75%	Y	N	**48.3**
ST41	Benhill Road Allotments, Benhill Rd	Urban background	Y	N	67%	Y	N	18.9*
H1	Hackbridge Road	Roadside	Y	N	75%	Y	N	33.7
H2	Clover Way	Urban background	Y	N	92%	Y	N	29.3
H3	57 London Rd	Roadside	Y	N	75%	Y	N	36.6

* - Data annualised in accordance with methodology in Box 3.2 in TG(09)
In Bold, exceedences of the NO_2 annual mean AQS objective.

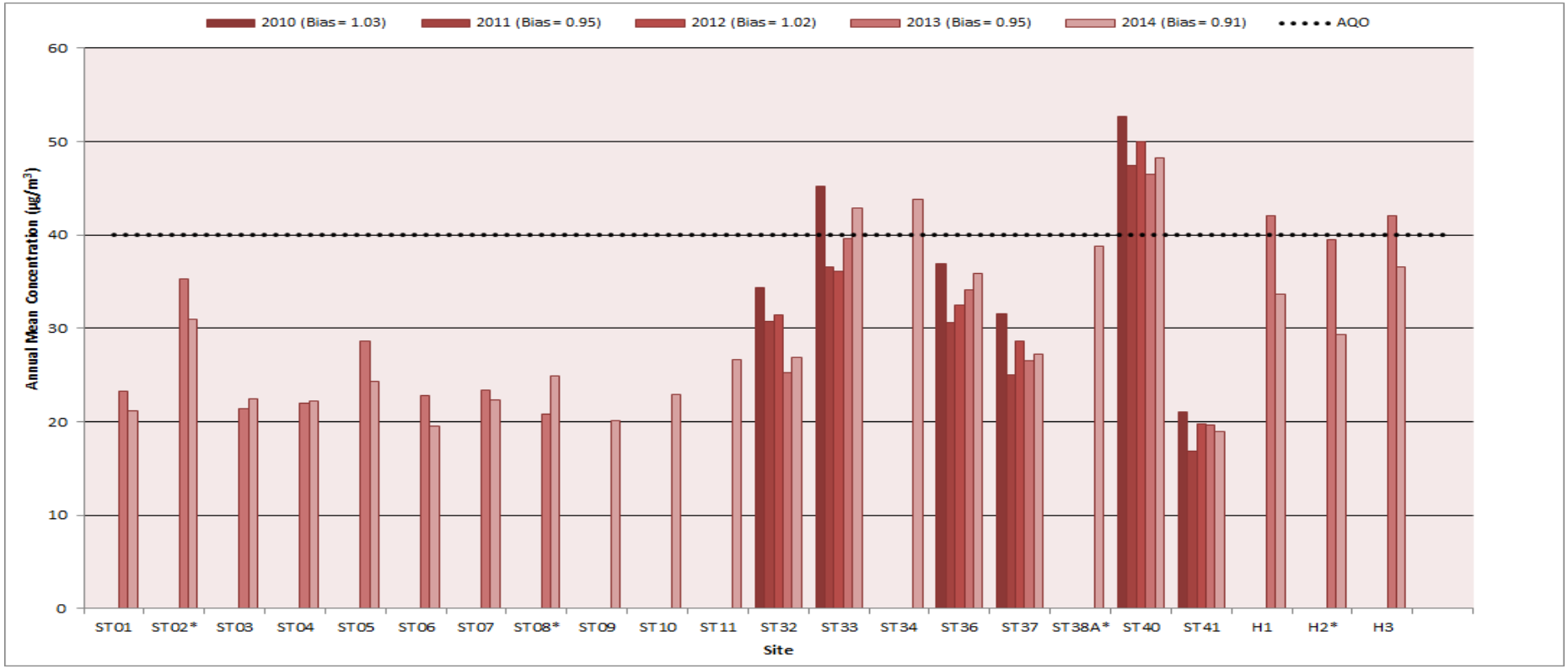
Table 2.6 - Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) – Adjusted for Bias				
			2010 (Bias Adjustment = 1.03)	2011 (Bias Adjustment = 0.95)	2012 (Bias Adjustment = 1.02)	2013 (Bias Adjustment = 0.95)	2014 (Bias Adjustment = 0.91)
ST01	Urban background	Y	n/a	n/a	n/a	23.2	21.2
ST02*	Urban background	Y	n/a	n/a	n/a	35.3	30.9
ST03	Urban background	Y	n/a	n/a	n/a	21.4	22.5
ST04	Urban background	Y	n/a	n/a	n/a	22.0	22.2
ST05	Urban background	Y	n/a	n/a	n/a	28.6	24.3
ST06	Urban background	Y	n/a	n/a	n/a	22.8	19.5
ST07	Urban background	Y	n/a	n/a	n/a	23.4	22.3
ST08*	Urban background	Y	n/a	n/a	n/a	20.8	24.9
ST09	Urban background	Y	n/a	n/a	n/a	n/a	20.2
ST10	Urban background	Y	n/a	n/a	n/a	n/a	23.0
ST11	Urban background	Y	n/a	n/a	n/a	n/a	26.6
ST32	Urban background	Y	34.4	30.8	31.5	25.3	27.0
ST33	Roadside	Y	**45.2**	36.6	36.1	39.6	**42.8**
ST34	Roadside	Y	n/a	n/a	n/a	n/a	**43.8**
ST36	Roadside	Y	36.9	30.6	32.5	34.1	35.9
ST37	Urban background	Y	31.6	25	28.6	26.5	27.3
ST38A	Roadside	Y	n/a	n/a	n/a	n/a	38.8
ST40	Roadside	Y	**52.7**	**47.4**	**50**	**46.5**	**48.3**
ST41	Urban background	Y	21	16.9	19.8	19.6	18.9
H1	Roadside	Y	n/a	n/a	n/a	**42.1**	33.7
H2*	Urban background	Y	n/a	n/a	n/a	39.5	29.3
H3	Roadside	Y	n/a	n/a	n/a	**42.1**	36.6

In Bold, exceedences of the NO_2 annual mean AQS objective.

* Period Means reported due to <33% data capture in 2013 for sites ST02, ST08, ST38 and H2.

Figure 2.4 - Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



* Period Means reported due to <33% data capture in 2013 for sites ST02, ST08, ST38 and H2. ST38A was installed in 2014.

The above figure shows the trend in NO_2 concentrations in Sutton Council. Peak concentrations were observed in 2010, with a marginal decline overall since then. The lowest results were recorded in 2011. Concentrations in 2014 were on average stable relative to 2013, with 9 sites increasing and 9 decreasing concentrations. Significant reductions were seen at H1-H3, where longer term data sets were collected in 2014. Only one site, ST40, has exceeded the NO_2 annual mean AQS objective in every year since 2010.

2.2.2 PM_{10}

There are two Air Quality Objectives for PM_{10}, namely:

- the annual mean of 40µg/m^3; and
- the 24-hour mean of 50µg/m^3 not to be exceeded more than 35 times a year.

The Council undertook monitoring of PM_{10} at four sites in 2014, using a Tapered Element Oscillating Microbalance (TEOM) monitor at three sites, and a Beta Attenuation Monitor (BAM) at ST5 Beddington Lane North. The sites are:

- Kerbside sites ST4 Wallington and ST6 Worcester Park; and
- Industrial sites ST8 Beddington Lane and ST5 Beddington Lane North.

Additionally, a Filter Dynamics Measurement System (FDMS) has been installed at ST6 Worcester Park. In previous years, a TEOM monitor for PM_{10} was installed at industrial site ST7 Therapia Lane.

Site ST5 was re-commissioned in July 2014 using a BAM monitor.

The monitoring data can be seen in Tables 2.7 and 2.8 below. Full details of the QA/QC procedure are provided in Appendix A.

Annualisation (short to long term data adjustment) was applied to data capture below 75%. Details of the annualisation are provided in Appendix A. Where data capture was below 90% the 90.4th percentile has also been reported for the 24-hour mean objective.

The following results should be treated with caution:

- ST4 Wallington: data for PM_{10} had not been ratified at time of reporting; and
- ST8 Beddington Lane: data for PM_{10} had not been ratified at time of reporting.

The 2014 results show that both the annual mean and the 24-hour mean objectives continue to be met at all monitoring sites. For trend analysis, see Figure 2.5 below.

Table 2.7 - Results of Automatic Monitoring of PM_{10}: 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 µg/m^3				
						2010 [c]	2011 [c]	2012 [c]	2013 [c]	2014 [c]
ST4	Kerbside	Y	100	20.5	Y	25.3 (98%)	28.9[a] (59%)	27.2 (99%)	25.5[a] (57%)	20.6[c] (21%)
ST6	Kerbside	Y	39.2	39.2	Y	25.5[a] (63%)	31.4 (79%)	28.3 (98%)	27.7[a] (73%)	26.2[c] (41%)
ST8	Industrial	Y	72.3	72.3	Y	-	-	29.8[a] (56%)	22.2 (94%)	22.8[c] (73%)
ST5	Industrial	Y	83.7	35.1	Y*	28.7 (93%)	28.0 (100%)	24.1[a] (26%)	-	20.5[c] (36%)

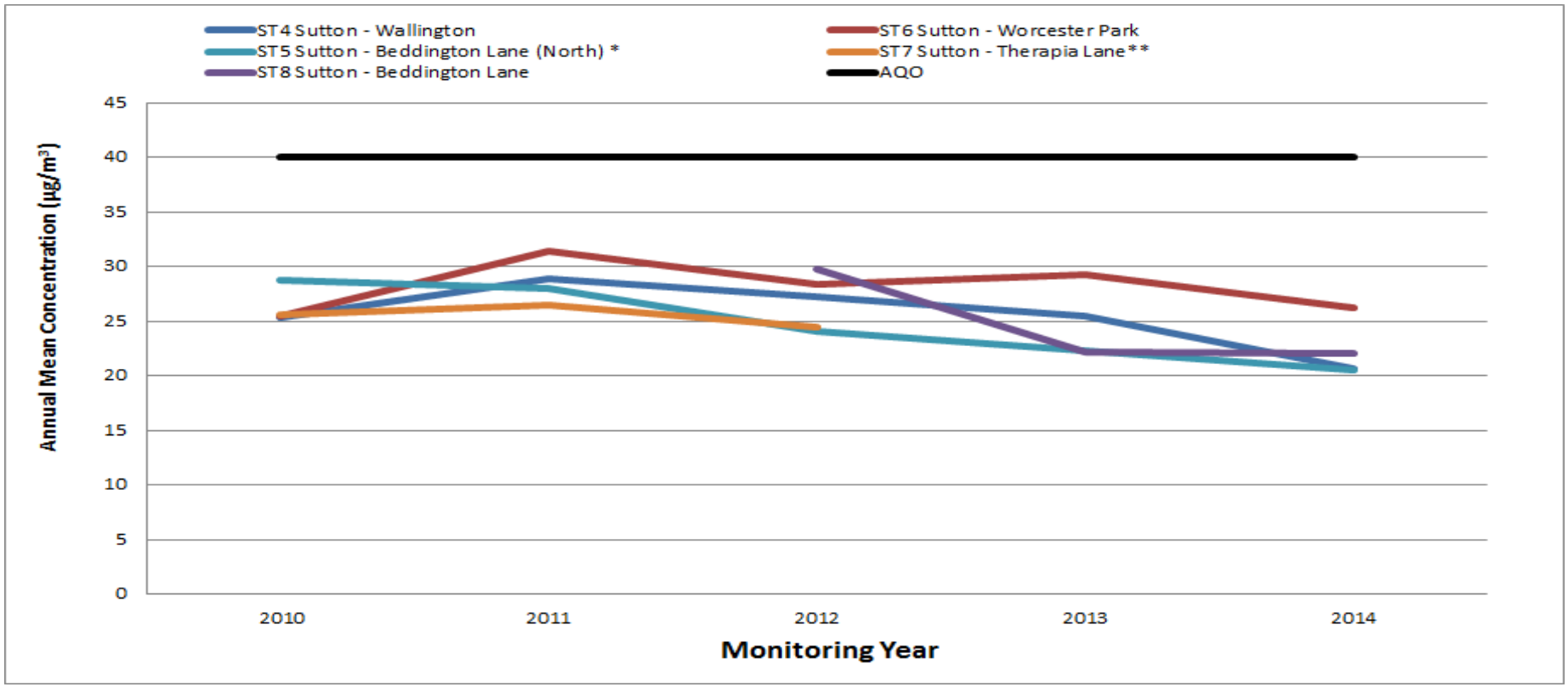
[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).
[c] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.
* After consultation with the network manager ERG, the data downloaded is confirmed as being reference equivalent.

Table 2.8 - Results of Automatic Monitoring for PM_{10}: 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 µg/m^3)				
						2010[c]	2011[c]	2012[c]	2013[c]	2014[c]
ST4	Kerbside	Y	100	20.5	Y	5	4 (37.8)	23	6 (39.3)	0 (27.5)
ST6	Kerbside	Y	39.2	39.2	Y	12 (40.4)	31 (**50.3**)	21	20 (44.3)	7 (42.4)
ST8	Industrial	Y	72.3	72.3	Y	-	-	10 (43.6)	5	10 (35.9)
ST5	Industrial	Y	83.7	35.1	Y*	20	25	17 (**59.2**)	-	0 (30.4)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. 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] if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets
* After consultation with the network manager ERG, the data downloaded is confirmed as being reference equivalent.

Figure 2.5 - Trends in Annual Mean PM_{10} Concentrations



* 2013 value for ST5 Beddington Lane North not available, trend line between 2012 and 2014 presented
** Monitoring at ST7 Therapia Lane discontinued

Figure 2.5 shows the trend in annual mean PM_{10} concentrations at the continuous monitoring sites between 2007 and 2014. This shows that concentrations have been on a generally downward trend, with ST6 Worcester Park consistently monitoring higher concentrations. All sites monitored concentrations below the annual mean air quality objective for all years.

2.2.3 Sulphur Dioxide

The council does not conduct any monitoring for SO_2

2.2.4 Benzene

Although no significant sources of benzene had been identified in the borough, monitoring using diffusion tubes was carried out as a check for several years. All monitoring sites were in compliance with the annual mean objective for benzene across the monitoring period. As no new sources were introduced and the monitoring data showed compliance, the monitoring ceased in 2012.

2.2.5 Other pollutants monitored

2.2.5.1 $PM_{2.5}$

The UK Government has set a national air quality objective for particulate matter smaller than 2.5 µm in diameter ($PM_{2.5}$) in the UK (excluding Scotland), which is not to exceed 25 µg/m^3 as an annual mean.

This objective has not been incorporated into LAQM Regulations, and authorities therefore have no statutory obligation to review and assess air quality against them. However, London Borough of Sutton conducted $PM_{2.5}$ monitoring at one site (ST5 - Beddington Lane North) in 2014.

This was conducted using a reference equivalent BAM analyser. Owing to the reduced data capture for this site it was necessary to annualise the data, which was done using the methodology outlined in Box 3.2 in TG.09.

The measured annual mean concentration at this site complies with the annual mean objective for $PM_{2.5}$ as shown in Table 2.9.

Table 2.9 - Results of Automatic Monitoring of $PM_{2.5}$: 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)	Limit Value	Annual Mean Concentration µg/m^3 2014 [c]
ST5	Industrial	Y	60.9	26.8	Y	25 µg/m^3	12.7[c]

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

2.2.5.2 Ozone

London Borough of Sutton conducted Ozone monitoring at one site, ST3 – Carshalton, in 2014.

In the air quality directive (2008/EC/50)[2] the EU has set a target value and a long term objective value for ozone (O_3) for the protection of human health. Target value: the maximum daily eight-hour mean may not exceed 120µg/m^3 on more than 25 days per calendar year averaged over three years. Long term objective value: the maximum daily eight-hour mean may not exceed 120µg/m^3 within a calendar year.

This objective has not been incorporated into LAQM Regulations, and authorities therefore have no statutory obligation to review and assess air quality against them, but they are included below in Tables 2.10 and 2.11 for comparison.

[2] European Environment Agency (2014), Ozone - 8 hour mean target value for the protection of human health, Available at: http://www.eea.europa.eu/data-and-maps/figures/ozone-8-hour-mean-target-value-for-the-protection-of-human-health

Table 2.10 - 2014 Ozone: Comparison with Long Term Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2014 %[b]	Max 8-Hour Running Mean	Max 8-hr mean exceedences of 100µg/m^3 on any given day	Max 8-hr mean exceedences of 120µg/m^3 on any given day
ST3	Suburban Background	Y	84.1	84.1	118.3	6	0

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. 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%).

Site ST3 – Carshalton has demonstrated compliance with the Ozone long term objective value in 2014.

Table 2.11 - 2012- 2014 Ozone: Comparison with Target Value

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Max 8-Hour Running Mean	Max 8-hr mean exceedences of 100µg/m^3 on any given day in period	Exceedences of 100µg/m^3 averaged over three years	Max 8-hr mean exceedences of 120µg/m^3 on any given day	Exceedences of 120µg/m^3 averaged over three years
ST3	Suburban Background	Y	91.4	164.4	19	6.3	8	2.6

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
[b] i.e. 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%).

Site ST3 – Carshalton has demonstrated compliance with the Ozone target value for the period between 2012 and 2014.

2.2.6 Summary of Compliance with AQS Objectives

London Borough of Sutton has examined the results from monitoring in the borough. Concentrations outside of the pollutants already declared with an AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

London Borough of Sutton 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

London Borough of Sutton 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.

A road with a high flow of buses or HGVs would be one where the proportion of these vehicles would be greater than 20%.

London Borough of Sutton confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

The Technical Guidance TG(09) states that if a junction requires assessment the following criteria will be met:

- 'Busy' Junctions are those with more than 10,000 vehicles per day; and
- Relevant exposure within 10 m of the kerb.

London Borough of Sutton has not identified any new junctions that have not been adequately considered in previous rounds.

London Borough of Sutton 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

London Borough of Sutton confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

London Borough of Sutton has identified a number of new developments with the potential to change traffic flows on associated roads significantly. The developments considered in this section are as follows:

- Mixed use Development at Sutton Point, Sutton Court Road – Application number B2013/67182
- Multi Storey Car Park Brighton Road – Application number B2013/67640
- Gas works Sutton High St - Application number B2013/68306

The impacts of these developments are considered below. Details of the planning applications submitted for all of these developments, along with any associated air quality chapters, can be found on Sutton's Planning online planning register[3].

Sutton Point – A large mixed use development comprising 332 apartment units, 139 bedroom hotel and 238 parking spaces. An air quality assessment[4] has been completed as part of the application. The impact is at worst 'moderate adverse' in the construction phase, but the generation of dust would be controlled by mitigation including vehicle washing, screens, water spraying and regular monitoring. These measures would be implemented as part of the Construction Environmental Management Plan (CEMP).

Local air quality would be affected by the traffic associated with this development, although the overall changes in traffic are anticipated to be relatively small. The assessment has also considered the effect of the combined heat and power (CHP) plant on air quality. 'Negligible' effects on air quality are predicted in the operational phase. At site, NO_2 concentrations are predicted to be below annual mean AQS

[3] London Borough of Sutton online planning register, Available at:http://gis.sutton.gov.uk/FASTWEB/welcome.asp
[4] Sutton Point Mixed Use, Application number B2013/67182, Air Quality Chapter http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTB201367182B07PL115042013%20%20ES%20Volume%201_low_res.pdf

objective by the time the development is completed. Thus the site was deemed suitable for residential use.

Car Park Brighton Road – Involves the demolition of an existing multi-storey car park, and its replacement with a five storey office building with subterranean parking. Whilst land use is changing, no residential receptors are introduced. There is a minor alteration associated with the road layout at the front of the development, but this is not anticipated to alter traffic flows significantly. The development was subject to EIA scoping exercise, in which no pollution issues were identified. The development did not meet the criteria to qualify for EIA and the Council agreed no air quality assessment was required as part of the development. However, a Transport Assessment[5] submitted with the application predicted an additional 65 vehicles on Brighton Road during the morning peak hour. During the evening peak hour a decrease of 107 vehicles are predicted on Brighton Road.

Gas works Sutton High St – Demolition of existing buildings/gas holders and redevelopment of the site for a mixed use retail/residential scheme comprising the construction of a supermarket above a car park providing 346 spaces fronting on Crown Road and 186 residential properties. An air quality assessment[6] has been conducted by consultants Waterman as part of the planning phase. The site is classed as a 'High Risk' site for demolition and construction phases, and mitigation measures are proposed accordingly to minimise this. These will be implemented via an Environmental Management Plan (EMP).

The effect on local air quality and on newly introduced receptors is considered negligible by the report. A Travel Plan is proposed for the development to encourage car sharing, reduce car trips and encourage walking and cycling, which would serve to limit new traffic emissions.

London Borough of Sutton has assessed new/newly identified roads with significantly changed traffic flows, and concluded that it will not be necessary to proceed to a Detailed Assessment at this time.

[5]Car Park Brighton Road, Application number B2013/67640, Transport Assessment http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTB201367640B08PL128062013%20TA.pdf

[6] Gas Works Sutton High Street, Application number B2013/68306, Air Quality Chapter http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTB201368306B07PL128102013_ALL%20CHAPTERS.pdf

3.7 Bus and Coach Stations

The assessment considers both NO_2 and PM_{10} emissions at bus stations that are not enclosed with >2500 movements per day.

London Borough of Sutton confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

London Borough of Sutton confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

London Borough of Sutton 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

Rail lines with a heavy traffic of diesel passenger trains are listed in the Technical Guidance TG (09).

London Borough of Sutton 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 considers SO_2 emissions at busy ports with between 5,000 and 15,000 movements per year and relevant exposure within 250 meters. This is not relevant to London Borough of Sutton.

London Borough of Sutton confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

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

The Council has identified one new installation, Beddington Farmlands Waste Management Facility – Application number D2012/66220/FUL, with the potential to impact local air quality.

This relates to an approved application for Phased demolition of existing buildings and development of an energy recovery facility (ERF) and buildings ancillary to the ERF, construction of two combined heat and power (CHP) pipelines, revisions to the approved restoration plan for the Beddington landfill site, amendments to the existing in-vessel composting operations, removal of existing access and provision of new access road and reconfiguration of access to Thames Water site to north.

Permission has been granted on the proviso that a number of conditions are adhered to. These include a requirement for the applicant to contribute to the continuous monitoring of air quality to assess the operational process contribution of the facility. It is expected that all conditions will be met and the subsequent air quality assessment is conducted on those grounds.

A comprehensive assessment of the air quality impacts of the development has been submitted as part of the planning application[7], which has considered emissions from both the stack and associated vehicle movements. A stack height of 85m was originally proposed, but was increased to 95m to improve dispersion and reduce ground level concentrations. Emissions will need to comply with the Waste Incineration Directive and the performance of the site will be regulated by the Environment Agency. The concentrations of specified pollutants will be monitored and made publicly available. The additional concentrations from any additional road traffic at site will be imperceptible, and therefore not significant.

Using IAQM guidance, the magnitude of impacts was found to be at worst small, and not significant even at the lower height of 85m. Whilst the report predicts NO_2

[7] Beddington Farmlands ERF Application D2012/66220/FUL, Available At: http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2012/SPPTD201266220D17PL106082012%20ES%20Technical%20Annex%20Air%20Quality%20assessment%20%20(Final).pdf

concentrations will increase, this increase is at no point greater than 5% of the AQS objective, with areas affected by an increase greater than 1% considered 'small'.

London Borough of Sutton 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

The following two applications have been considered in relation to an increase in emissions or new relevant exposure:

- 154a Beddington Lane – Application number D2013/68218; and
- 124 Beddington Lane – Application number D2013/68624.

154a Beddington Lane - An application was submitted for a proposed waste to energy plant and a detailed assessment[8] of the installation was conducted by Arup as part of the planning process, which concluded a flue height of 3m above roof level (14.1m above ground level) was necessary. Modelling was undertaken at this flue height, and the maximum process contribution at assessed receptors was 0.2 µg/m^3 for NO_2. At all assessed receptors, impact descriptors were 'negligible' and that no new exceedences of the AQS objective were to be introduced by the installation.

The above application number refers to a variation, and introduction of bio-ethanol plant. This is currently not in operation. As the application pertains to an existing plant, no additional vehicle movements are introduced. The variation is therefore considered not significant in terms of air quality.

124 Beddington Lane – An application was submitted for a proposed Materials Recycling Facility and a screening assessment[9] was conducted for this site as part of the planning phase. This suggested that whilst exceedence of the annual mean NO_2 AQS objective was predicted at one receptor location, this was not due to the introduction of the site.

[8] 154a Beddington Lane, Application D2013/68218 Air Quality Chapter, Available at: http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTD201368217D17PL117102013%20Air%20Quality%20Assessment_Issue%202.pdf

[9] 124 Beddington Lane, Application number Air Quality Chapter, Available at: http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTD201368624D17PL130122013%2033502%20-%20Beddington%20Lane%20Air%20Quality%20Assessment%20part%201.pdf

This site is an enclosed waste management area, but the business running the installation went into liquidation in 2014, so it is currently not in operation. There remain stockpiles of waste on site, though in their current state, these are not presenting issues with respect to air quality.

At the end of 2014, a new operator took over the site and discussions on the future use and relevant controls are on-going at the time of writing which will apply to the management of the stockpiles and the covering of vehicles entering/leaving the site.

London Borough of Sutton has assessed industrial installations with variation of emissions and concluded that it will not be necessary to proceed to a Detailed Assessment at this time, though it may be necessary to conduct assessment of 124 Beddington Lane in future.

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

London Borough of Sutton has identified 112 Beddington Lane – Application number D2013/67833, as having changed since the last round of review and assessment.

This application refers to a variation to conditions of a previous planning permission (D2010/63752) to operate a recycling centre (waste management facility). The application involves a change in the design to reduce the size of buildings. The use of the installation has not changed since last round of assessment. A condition requiring the submission of a dust management plan setting out mitigation measures during construction and operational phases was included and this has been submitted.

London Borough of Sutton has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

London Borough of Sutton confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

Studies have been conducted by the Environment Agency, Department for Environment Northern Ireland and a local authority. From the studies the following guidance has been produced as to assessment of poultry farms:

- Farms housing in excess of;
  - 400,000 birds if mechanically ventilated;
  - 200,000 birds if naturally ventilated;
  - 100,000 birds for any turkey unit; and
- Relevant exposure within 100m of the poultry units.

London Borough of Sutton confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

London Borough of Sutton has identified an installation (79-83 Beddington Lane, Application number D2014/69228) with the potential to impact local air quality.

A waste management facility previously existed at the application site which gave rise to a number of nuisance dust complaints but which has since closed. An initial application for the installation of a BioFlame boiler in 2009 was submitted, but not implemented. A new operator has since bought the site and associated permissions, and submitted a new planning application for a fully enclosed waste treatment plant as a variation to the initial 2009 application. This variation includes the incorporation of a stack into the main building to serve an Advanced Thermal Treatment process which will emit above the roofline.

A detailed assessment[10] of the installation by consultants WYG was submitted as part of the application, which concluded that for all pollutants relevant to LAQM at residential receptor locations, the AQS objectives would be met with the plant in operation, though concentrations of annual mean NO_2 were within 10% of the AQS objective. Additionally, the most significant impact of the site is in relation to annual mean NO_2, which was considered 'slight adverse'.

The installation's process emissions will be controlled through operation in accordance with the conditions of the Environmental Permit issued by the Environment Agency. The report also recommends implementing a monitoring regime in the area, with utilisation of a light scattering particulate monitor.

The assessment of the installation modelled emissions at 20m stack height, with 1.1m diameter. In order to achieve the compliance with the AQS objectives that the report predicts, this should be treated as minimum stack height. At time of writing, there are ongoing negotiations between the developer and the EA regarding the meeting of permit conditions with current proposed stack dimensions.

[10] 79-85 Beddington Lane, Application D2014/69228 AirQuality Chapter, Available at : http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2014/SPPTD201469228D17PL107042014%20AIR%20QUALITY%20ASSESSMENT.pdf

It is also agreed that should the proposed installation be implemented, the previously approved BioFlame facility will not go ahead.

London Borough of Sutton 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

The above application has been considered in conjunction with the existing installations in the area, and it was considered that the cumulative impact of these was not significant enough to introduce any new exceedences of the AQS objective.

London Borough of Sutton has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

London Borough of Sutton confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

London Borough of Sutton confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The 2014 monitoring data, after having been appropriately analysed, indicates a continued exceedence of the annual mean NO_2 AQS objective at various locations across the borough. This is reflected in the results of both the passive diffusion tube and continuous monitoring. Exceedences were monitored at automatic kerbside sites ST4 - Wallington and ST6 - Worcester Park and roadside non-automatic sites ST33, ST34 and ST40. A concentration above 40µg/m^3 was also monitored at a new location (ST35) in West Sutton but this was not deemed representative of annual mean concentrations so is not considered an exceedence of the objective. The site types of these locations confirm London Borough of Sutton's previous conclusions that vehicular emissions are the main source of pollutants in the Borough.

The automatic Industrial site, ST5 was within 10% of the AQS objective, though this may be attributed to uncertainty associated with annualisation. Additionally, a non-automatic site classed as urban background, H3 was also within 10% of the objective and had exceeded in 2013, indicating the potential for an air quality issue in these areas.

With regard to the 1-Hour objective for NO_2, no exceedences of the objective were recorded at any sites. This is inclusive of all non-automatic sites where monthly mean concentrations were always below 60µg/m^3.

That said, ST4 – Wallington, which had not complied in previous years, reported very low data capture in 2014. In those circumstances, it is necessary to calculate the 99.8th percentile as an indication of the likelihood of exceedence with full data capture. As this was calculated to be 227.8µg/m^3 for 2014, it is considered likely the hourly mean objective would have been exceeded again given increased data capture.

In respect of PM_{10}, there are no exceedences of either the annual mean or the 24-hr mean objective at any site in 2014, as was the case in 2013. Concentrations of Particulate Matter have generally been observed to be decreasing since 2011 at monitoring sites within the borough.

For the other two pollutants monitored in the borough in 2014, O_3 at ST3 – Carshalton and $PM_{2.5}$ at ST5 - Beddington Lane North, compliance was demonstrated with the relevant objectives.

As the entire borough is declared as an AQMA for NO_2 and PM_{10}, there are no new exceedences of the AQS objective identified outside of AQMA in 2014.

Exceedences of the NO_2 annual mean are still occurring in the borough, and it is likely that the NO_2 hourly objective would have been exceeded at site ST4 with greater data capture. Therefore the AQMA should remain for NO_2.

In terms of PM_{10}, both objectives have been complied with since 2009. However, given the industrial processes which take place in the borough, particularly with regard to waste management, it is considered prudent for the AQMA to remain in place for the time being. The designation will necessitate the implementation of appropriate mitigation measures in industrial processes, thus minimising their impact.

Based on the above, there is no need to proceed to Detailed Assessment.

8.2 Conclusions from Assessment of Sources

Several local developments have been considered in this report.

In most instances, a detailed assessment of air quality impacts was submitted as part of the planning application, within which a conclusion was drawn that the development would not be significant in terms of its impact on local air quality. This is largely with the assumption that mitigation measures are employed, particularly in the construction/demolition phases and that regulatory control of industrial emissions is implemented. It is therefore essential that these measures are demonstrated as being complied with, as the impacts without them have the potential to be significant.

Principal among these is the Beddington Farmlands site, Application number D2012/66220/FUL, where compliance is based on stack height and effective controls. The agreed increase in height of the stack will aid dispersal and the ongoing operations will be regulated by the EA. It is recommended that monitoring of ambient air quality be carried out prior to development and that this continue once the installation becomes operational.

It is recommended that a network of automatic air quality monitors be maintained across the borough to gather data on trends in concentrations. This is particularly important given that recent studies have indicated that background concentrations of NO_2 are not declining at the rate previously thought[11].

8.3 Proposed Actions

Following the 2015 Updated Screening Assessment, there is no need to proceed to Detailed Assessment. However, it is recommended that the London Borough of Sutton:

- Consider conducting an NO_2 co-location study, commencing in 2016, for the derivation of a local bias adjustment factor;
- Continue with the currently implemented AQMA and Action Plan;
- Continue to monitor planning submissions for any new industrial installations in the Beddington Area;
- Monitor the impact of the proposed installations noted in this report post operation, with particular focus on implementation of suggested mitigation measures;
- Proceed to the 2016 Progress Report.

[11] Carslaw, D, Beevers, S, Westmoreland, E, Williams, M, Tate, J, Murrells, T, Steadman, J, Li, Y, Grice, S, Kent, A and Tsagatakis, I. 2011. Trends in NO_x and NO_2 emissions and ambient measurements in the UK. Prepared for DEFRA, 18th July 2011

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3. London Borough of Sutton online planning register, Available at: http://gis.sutton.gov.uk/FASTWEB/welcome.asp

4. Sutton Point Mixed Use, Application number B2013/67182, Air Quality Chapter http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTB201367182B07PL115042013%20%20ES%20Volume%201_low_res.pdf

5. Multi Storey Car Park Brighton Road, Application number B2013/67640, Transport Assessment http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTB201367640B08PL128062013%20TA.pdf

6. Gas Works Sutton High Street, Application number B2013/68306, Air Quality Chapter http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTB201368306B07PL128102013_ALL%20CHAPTERS.pdf

7. Beddington Farmlands ERF Application D2012/66220/FUL, Available At: http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2012/SPPTD201266220D17PL106082012%20ES%20Technical%20Annex%20Air%20Quality%20assessment%20%20(Final).pdf

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9. 124 Beddington Lane, Application number D2013/68624, Air Quality Chapter, Available at: http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2013/SPPTD201368624D17PL130122013%2033502%20-%20Beddington%20Lane%20Air%20Quality%20Assessment%20part%201.pdf

10. 79-85 Beddington Lane, Application D2014/69228Air Quality Chapter, Available at: http://5.150.92.212/fastweb/fastweb_upload/Support/Linkdocs/2014/SPPTD201469228D17PL107042014%20AIR%20QUALITY%20ASSESSMENT.pdf

11. Carslaw, D, Beevers, S, Westmoreland, E, Williams, M, Tate, J, Murrells, T, Steadman, J, Li, Y, Grice, S, Kent, A and Tsagatakis, I. 2011. Trends in NOx and NO_2 emissions and ambient measurements in the UK. Prepared for DEFRA, 18th July 2011

12. National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/15 published in March 2015, available at: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

13. http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-121--124-and-AIR-PT-Rounds-1-3-4-6-(April-2013--February-2015)-NO_2-report.pdf

Appendices

Appendix A: QA/QC Data

Appendix B: DT monitoring data

Appendix A: QA/QC Data

Bias Factor from Local Co-location Studies

London Borough of Sutton did not conduct any co-location studies in 2014, so it was not possible to calculate a local adjustment factor.

Discussion of Choice of Factor to Use

As a result, the national adjustment factor is applied to diffusion tube monitoring results in this report.

Diffusion Tube Bias Adjustment Factors

The diffusion tubes are supplied and analysed by Gradko utilising the 20% triethanolamine (TEA) in water preparation method. A bias adjustment of 0.91 for the year 2014 (based on 16 studies) has been derived from the national bias adjustment calculator[12].

PM Monitoring Adjustment

The monitoring data for the London Borough of Sutton is part of the London Air Quality Network, managed by Kings College London. Where an instrument is not reference equivalent, as is the case with three of the five (four for PM_{10}, one for $PM_{2.5}$) PM instruments, adjustment is carried out in the validation process. For TEOM, a VCM correction has been applied.

Short-term to Long-term Data Adjustment

Data capture was low at a majority of the monitoring locations. It was therefore necessary to 'annualise' the data, that is adjusting short term means to be representative of a long term annual mean. This was done for three of the NO_2 sites and all PM sites. The details of this are outlined below, displayed by pollutant and sub-divided by site.

[12] National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/15 published in March 2015, Available at: http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Automatic Data Nitrogen Dioxide (NO_2)

ST3 - Carshalton

Site	Annual Mean	Period Mean	Ratio
London Hillingdon	57.5	61.6	0.93
London N. Kensington	34.4	36.1	0.95
London Eltham	19.8	20.7	0.96
London Teddington	27.4	21.6	1.27
London Westminster	46.1	47.3	0.98
		Average	1.02

ST4 - Wallington

Site	Annual Mean	Period Mean	Ratio
London Hillingdon	57.5	60.8	0.95
London N. Kensington	34.4	39.9	0.86
London Eltham	19.8	16.6	1.19
London Teddington	27.4	26.0	1.05
London Westminster	46.1	50.1	0.92
		Average	0.99

ST5 – Beddington Lane North

Site	Annual Mean	Period Mean	Ratio
London Hillingdon	57.5	60.8	1.02
London N. Kensington	34.4	39.9	0.98
London Eltham	19.8	16.6	1.15
London Teddington	27.4	26.0	0.78
London Westminster	46.1	50.1	0.99
		Average	0.99

Automatic Data PM_{10}

ST4 - Wallington

Site	Annual Mean	Period Mean	Ratio
Reading New Town	14.0	13.5	1.04
London N. Kensington	22.7	22.6	1.01
Rochester Stoke	17.6	14.8	1.19
Thurrock	19.3	19.0	1.02
London Eltham	18.1	15.9	1.14
		Average	1.08

ST5 – Beddington Lane North

Site	Annual Mean	Period Mean	Ratio
Reading New Town	14.0	13.8	1.01
London N. Kensington	22.7	21.4	1.06
Rochester Stoke	17.6	15.1	1.14
Thurrock	19.3	19.0	1.01
London Eltham	18.1	15.7	1.15
		Average	1.07

ST6 – Worcester Park

Site	Annual Mean	Period Mean	Ratio
Reading New Town	14.0	14.3	0.98
London N. Kensington	22.7	24.5	0.93
Rochester Stoke	17.6	18.0	0.98
Thurrock	19.3	19.4	0.99
London Eltham	18.1	19.8	0.91
		Average	0.96

ST8 – Beddington Lane

Site	Annual Mean	Period Mean	Ratio
Reading New Town	14.0	14.5	0.96
London N. Kensington	22.7	23.4	0.97
Rochester Stoke	17.6	18.4	0.96
Thurrock	19.3	19.5	0.99
London Eltham	18.1	19.1	0.95
		Average	0.97

Automatic Data $PM_{2.5}$

ST5 - Beddington Lane North

Site	Annual Mean	Period Mean	Ratio
Reading New Town	9.8	9.5	1.04
London N. Kensington	15.9	15.0	1.06
Rochester Stoke	15.0	10.9	1.38
London Eltham	11.8	11.7	1.01
		Average	1.12

Non-automatic Data - NO_2

Annualisation was undertaken for all sites with data capture between 33% and 74%. Where data capture was less than 33%, concentrations were reported as a period mean as it was not deemed appropriate to annualise this data. Annualisation information is given below:

Site	Raw Data Average µg m-3	Months	Annualisation Factor London Hillingdon	Annualisation Factor London Westminster	Annualisation Factor London N Kensington	Annualisation Factor London Teddington	Average Annualisation Factor	Annualised Data Average µg/m-3	Bias Adjusted Finalised Average / µg/m-3
ST34 Oakhill Road	52.9	4	0.966	0.946	0.903	0.826	0.910	48.1	43.78
ST38 Brighton Road, Sutton	42.7	7	1.088	0.994	1.039	0.869	0.997	42.6	38.75
ST41 Allotments, Benhill Rd	20.1	8	1.071	1.030	1.091	0.944	1.034	20.8	18.89

QA/QC of Automatic Monitoring

As previously mentioned, the Council's monitoring stations fall within the LAQN and QA/QC standards are delivered accordingly. This is considered close, if not equal to, AURN standard.

QA/QC of Diffusion Tube Monitoring

Gradko International Ltd is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing schemes. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. Gradko previously participated in the Workplace Analysis Scheme for Proficiency (WASP) for NO_2 diffusion tube analysis and the Annual Field Inter-Comparison Exercise. In April 2014, a new scheme, AIR PT[13], was introduced. This is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

Defra and the Devolved Administrations advise that diffusion tubes used for Local Air Quality Management should be obtained from laboratories that have demonstrated satisfactory performance in the AIR PT scheme. Laboratory performance in AIR PT is also assessed, by the National Physical Laboratory (NPL), alongside laboratory data from the monthly NPL Field Intercomparison Exercise carried out at Marylebone Road, central London. A laboratory is assessed and given a 'z' score. A score of 2 or less indicates satisfactory laboratory performance.

Gradko International Ltd's performance for 2014 is covered by the last round of the WASP scheme, WASP R124 and the first four rounds of AIR PT, AR001-004. In each of these rounds, 100% of samples submitted by Gradko were deemed satisfactory.

[13] http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-121--124-and-AIR-PT-Rounds-1-3-4-6-(April-2013--February-2015)-NO_2-report.pdf

Appendix B: Diffusion Tube Monitoring Data

Code	Name	X (Eastings)	Y (Northings)	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14	Oct-14	Nov-14	Dec-14	Annual Average
ST01	Abbey Primary School	525516	166514	n/a	22.74	33.05	13.81	19.97	18.35	17.75	16.06	28.82	22.76	35.59	26.87	23.25
ST02	Avenue Primary School	525112	162349	n/a	33.87	38.71	28.95	34.41	27.81	35.76	39.27	31.88	34.03	n/a	35.10	33.98
ST03	Bandon Hill Primary	529667	163769	n/a	22.77	30.51	23.52	23.04	20.77	21.93	16.14	29.52	21.10	34.64	27.55	24.68
ST04	Beddington Park Primary	530012	165420	n/a	n/a	34.34	22.73	21.91	20.84	21.36	14.95	29.81	21.03	32.18	24.89	24.40
ST05	St Cecilia's Primary	523874	165778	n/a	25.39	38.49	25.71	23.61	15.19	21.08	17.71	33.94	26.97	38.89	n/a	26.70
ST06	St Mary's Infants School	527627	164714	n/a	17.04	30.04	20.92	18.94	15.88	17.93	14.30	27.30	17.74	32.48	23.58	21.47
ST07	Hackbridge Primary	528401	166038	n/a	22.04	n/a	n/a	18.78	22.17	21.09	17.43	31.87	22.55	36.91	28.09	24.55
ST08	Victor Seymour	527788	164982	n/a	25.44	34.39	27.01	24.39	20.51	24.50	24.27	23.13	29.29	34.58	33.36	27.35
ST09	All Saints Primary	528287	164432	n/a	19.27	31.42	22.46	19.65	18.50	17.88	16.59	26.23	19.19	29.35	23.16	22.15
ST10	Muschamp Priory	527299	165789	n/a	21.07	37.05	22.69	17.40	19.71	18.55	17.82	31.35	21.78	39.34	30.90	25.24
ST11	Sherwood Park School	529835	165041	n/a	26.98	47.25	23.61	26.51	20.98	21.84	n/a	29.61	26.90	36.03	32.79	29.25
ST32	Alcorn Close	525184	165845	n/a	25.52	42.31	29.44	29.90	26.17	24.18	20.46	41.02	26.50	32.31	27.93	29.61

ST33	Carshalton Road	526048	164032	n/a	39.19	53.14	42.89	46.66	46.75	38.59	40.80	52.40	53.64	61.29	42.38	**47.07**
ST34	Oakhill Road	525772	165118	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	45.23	51.34	56.77	58.07	**52.85**
ST36	Croydon Rd, Beddington	530645	164839	n/a	35.81	46.86	38.05	37.02	32.60	39.19	29.86	46.73	36.24	51.73	39.32	39.40
ST37	St Nicholas Way	525718	164497	n/a	27.19	38.00	28.08	28.60	25.46	n/a	20.73	33.79	23.35	44.11	30.13	29.94
ST38A	Brighton Road, Sutton	526046	163636	n/a	n/a	n/a	n/a	n/a	32.21	30.56	36.80	53.09	46.57	58.70	40.95	**42.70**
ST40	38 High Street, Cheam	524357	163599	n/a	42.82	69.34	44.84	51.86	46.08	56.35	n/a	66.36	45.89	53.92	n/a	**53.05**
ST41	Benhill Road Allotments, Benhill Rd	526569	165146	n/a	20.11	28.35	20.81	19.58	14.19	18.50	14.15	24.95	n/a	n/a	n/a	20.08
H1	Hackbridge Road	528373	166077	n/a	36.3	52.37	36.04	33.31	39.21	32.06	24.98	43.08	n/a	n/a	36.05	37.04
H2	Clover Way	528437	166275	n/a	33.15	40.39	30.36	31.29	26.40	27.99	25.40	28.25	33.46	39.36	38.37	32.22
H3	57 London Rd	528499	166004	n/a	38.57	59.34	40.15	45.38	37.96	37.21	31.02	46.25	25.99	n/a	n/a	**40.21**