2013/14 Air Quality Progress Report for Greater Manchester

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

Date: December 2014

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Executive Summary

This report is for the Greater Manchester districts Bury, Bolton, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan.

It is the second report for the ten districts. Previous progress reports were prepared and submitted separately by the constituent authorities, although these authorities have successfully worked closely together drafting previous district reports.

Long term trends shown that there has been an improvement in air quality but areas still remain above the air quality objective for the annual mean nitrogen dioxide

The assessment of monitoring data shows that real time monitoring data for the nitrogen dioxide annual mean objective broadly confirms the existing AQMA boundaries. Exceedences were noted at several roadside monitoring sites.

Measurements from the Greater Manchester's diffusion tube network confirms there are locations that continue to be above the annual mean nitrogen dioxide. There are no exceedences of the hourly nitrogen dioxide objective.

Real time monitoring data for particulate matter (less than 10 microns) shows that annual average objectives are not exceeded and are following a downward trend. No sites had more than 35 occurrences of the daily mean particulate objective and therefore this objective is met.

Reporting of pollutants, sulphur dioxide, carbon monoxide and benzene, has been discontinued as previous assessments, indicated no exceedences.

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1 Introduction

1.1 Description of Local Authority Areas

The Greater Manchester regional pollution group represents the ten authorities that constitute the Greater Manchester Combined Authority (GMCA). These authorities are Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford, and Wigan. These are also the main members of the Association of Greater Manchester Authorities (AGMA). The Combined Authority, shares the same statutory powers for Local Air Quality Management (LAQM) Sections 82 to 84 of the Environment Act 1995 as the districts.

Greater Manchester has a population of over 2.5 million residents over an area of approximately 500 square miles. Within the conurbation there is a mix of high-density urban areas, suburbs, semi-rural and rural locations, and the area is characterised by the strong regional centre of Manchester, The Quays and Trafford Park.

Greater Manchester is the largest and strongest economic area in the North of the country, with over 40% of the North West's total productivity. However despite this, it contains some of the most deprived areas in the country.

There are over 9,000 km of roads, carrying annual traffic of 13,000 vehicle kilometres on the motorways and A and B roads. Manchester Airport is the largest regional centre outside London. The M62 sits on the edge of the conurbation as it forms the East – West main route, serving Liverpool and Hull. The M60 orbital route encompasses Greater Manchester is over 36 miles in length, annual average weekday traffic flows are over 200,000 and the network is often congested at peak times. Other major motorways are the M6, M56, M61, and M66.

1.2 Purpose of Progress 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.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

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 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	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 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
Particulate Matter (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

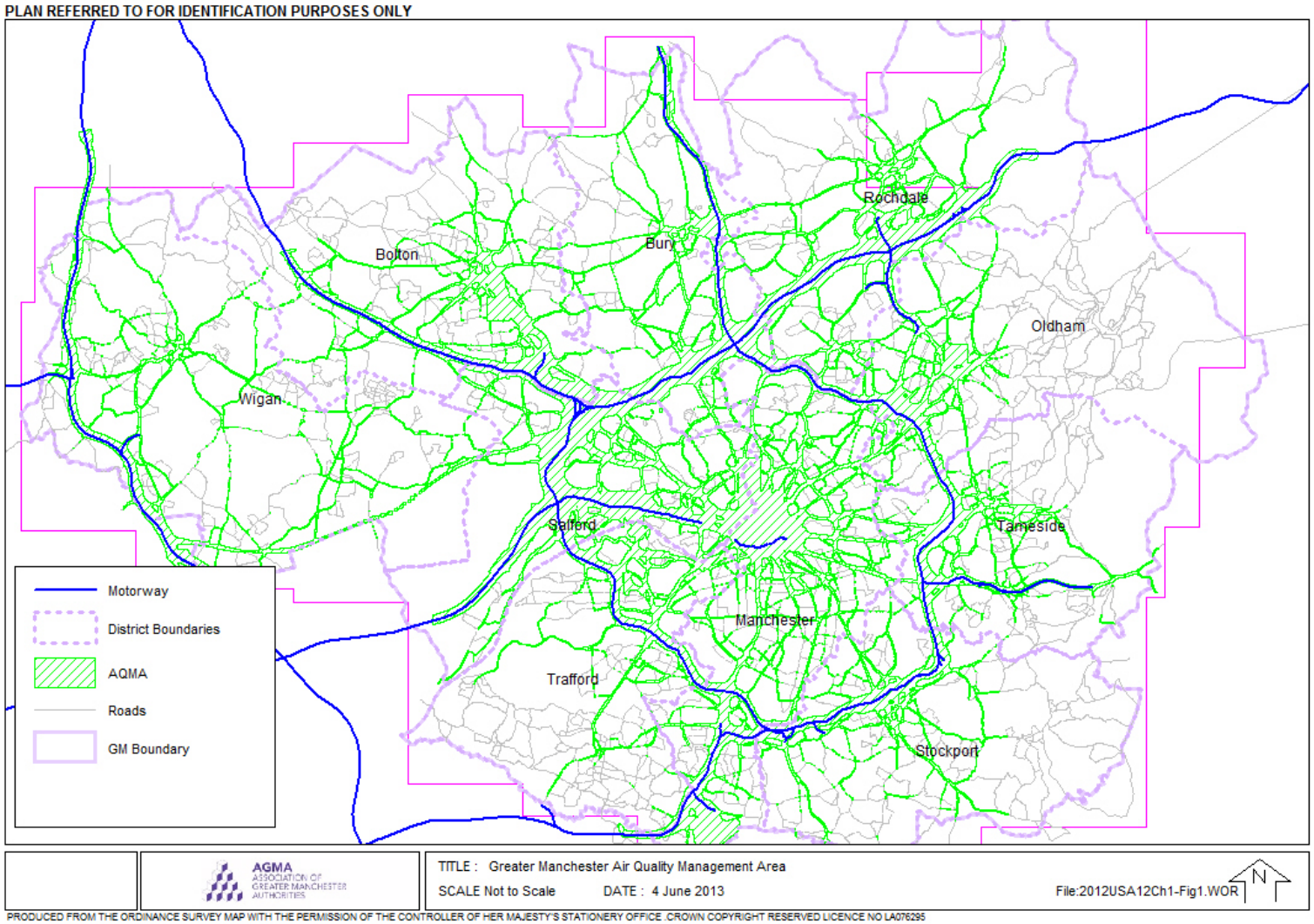
1.4 Summary of Previous Review and Assessments

A summary of Greater Manchester work is provided in the table 1.2 below:

Table 1.2 Summary of Greater Manchester Air Quality Assessment

Date	Report / Stage	Outcome
1999	1st Detailed Assessment Modelling Round 2	Emissions inventory 1997. Declared AQMA for annual mean NO2 including areas for daily PM10. AQMAs declared: 2001-2002.
2004	2nd Detailed assessment Modelling Round 2	Modelling Round 2 Base on emissions inventory for: 2001. AQMAs NO2 annual mean declared: 2005-2006. PM10 revoked.
2005-6		All LAs re-declared NO2 AQMA at 35 µg/m3 and revoked PM10.
2009	USA 2	Most districts recommended modelling work due to traffic emissions. Salford progressed to detailed assessment for railways, by monitoring and found to be below air quality standard.
2010-11	Progress Reports	Districts submitted reports direct to DEFRA.
2012	USA 2012	Joint Report for Greater Manchester Supported the re modelling of air quality in Greater Manchester.

Figure 1.1 Greater Manchester AQMA Boundaries (nitrogen dioxide, annual mean)



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Local Authorities carry out air quality monitoring programmes as part of their local air quality management responsibilities under the Environment Act 1995. The Greater Manchester Air Quality Network (GMAQN) was formed in 2013 to manage and provide a cost effective platform for the service, maintenance and data management of the monitoring equipment in the Greater Manchester Area. The network costs are shared equally among the 10 local authorities. DEFRA supports monitoring of some stations as part of the Automatic and Urban Rural Network (AURN).

The Greater Manchester authorities reviewed the automatic monitoring program in 2011 to ensure the network met future monitoring needs, to provide best value and help maintain key sites in the network. The review resulted in the decommissioning of a number of sulphur dioxide and carbon monoxide instruments. It also recommended a station for nitrogen dioxide and particulates to the north eastern side of Greater Manchester, which was commissioned in early 2014.

GMAQN and DEFRA, ensure that QA/QC checks and data validation of sites in the network are undertaken by external contractors to ensure that the objectives in the European Union's Air Quality Directive (2008/50/EC) are fulfilled. Ricardo–AEA provide data management and auditing for sites in the GMAQN. Data management at the AURN sites is undertaken by Bureau Veritas with Ricardo-AEA undertaking QA/QC audits. Prior to the formation of GMAQN some site data management was undertaken by Casella and then Bureau Veritas.

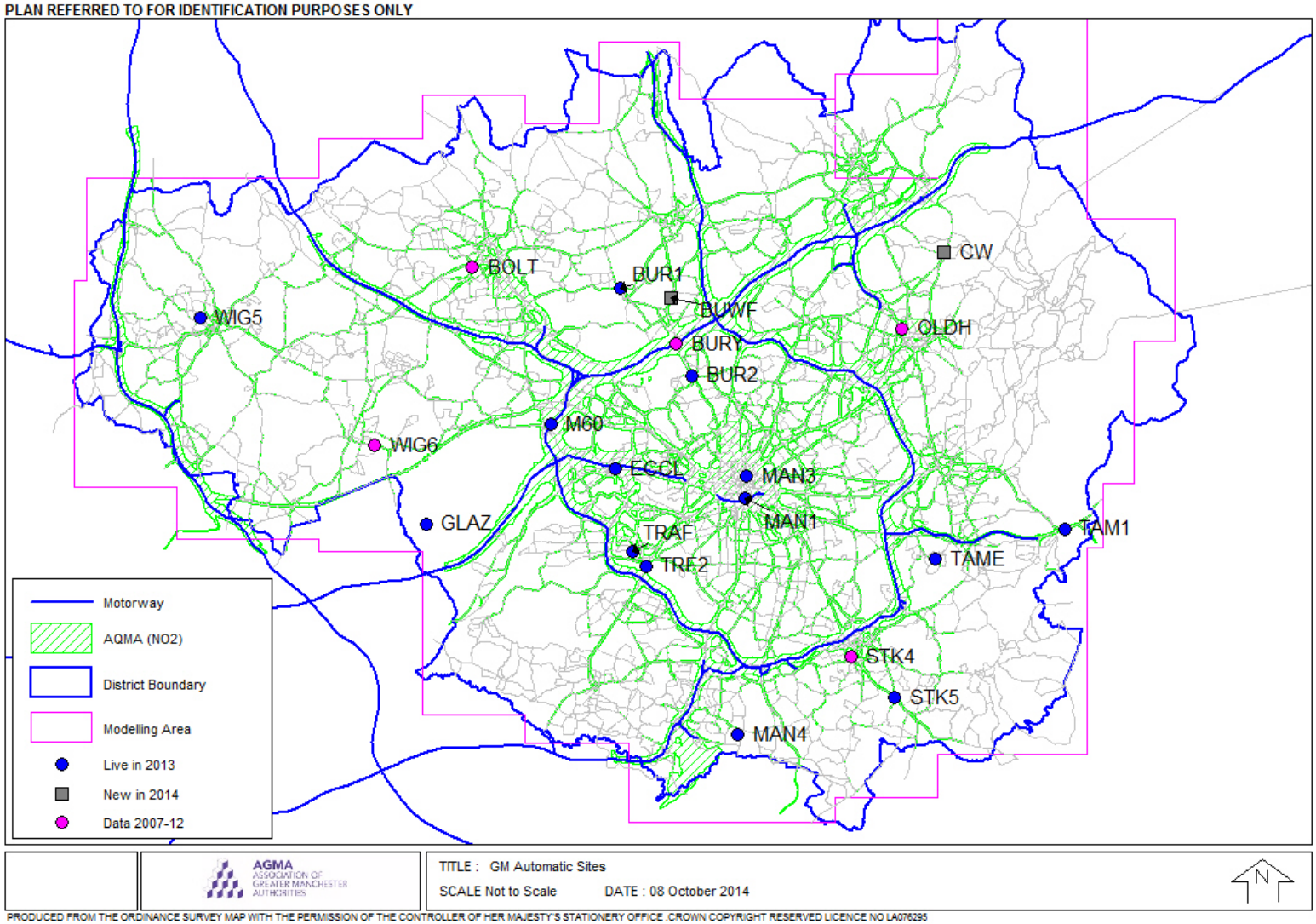
The results for the automatic sites in this report are based on the Ricardo-AEA spreadsheet, with additional data from districts, which is available on the Greatairmanchester website. Further details of data management are provided in Appendix 1. Table 2.1 and Figure 2.1 summarise the details of automatic sites in Greater Manchester operational during the period of the report.

Table 2.1 Details of Automatic Monitoring Sites

Site Code	Site Name	Pollutants	Type	X(TfGM)	Y(TfGM)	AQMA	Open	Closed	Map
BOLT	Bolton College	CO NO2 O3 PM10 SO2	UB	371000	408496	N	03/02/1998	22/03/2011	Link
BURY	Bury Roadside	CO NO2 PM10(F) PM25(F)	RS	380906	404757	Y	20/01/1997	06/09/2012	Link
BUWF	Bury Roadside 2 (See note)	NO2 PM10 (F) PM2.5(F)	RS	380637	406976	Y	Oct-14		Link
BUR2	Bury Prestwich	NO2 PM10	RS	381650	403222	Y	19/09/2002		Link
BUR1	Bury Radcliffe	NO2 PM10	RO	378190	407480	Y	01/09/2002		Link
GLAZ	Glazebury	NO2 O3	RU	368759	396028	N	26/01/2004		Link
MAN3 MAN7	Manchester Piccadilly	NO2 O3 PM10(B) PM25(F) SO2	UC	384310	398337	Y	18/12/1995		Link
MAN4 MAN8	Manchester South	NO2 O3 SO2 PM10(P) PM2.5(P)	SU	383904	385818	N	06/12/1996		Link
ECCL	Salford Eccles	NO2 O3 PM10(F) PM25(F)	UI	377926	398728	Y	20/03/1997		Link
WIG5 WIG7	Wigan Centre	NO2 O3 PM25; PM10	UB	357815	406022	N	08/10/2004		Link
MAN1	Manchester Oxford Rd	NO2 PM10 (B)	KS	384233	397287	Y	08/03/2010		Link
OLDH	Oldham West End Huse	CO NO2 O3 PM10 SO2	UC	391860	405514	Y	04/12/1998	05/07/2011	Link
CW	Oldham Crompton Way	NO2 PM10(B)	RS	393887	409191	Y	Feb-14		Link
M60	Salford M60	CO NO2 O3 PM10	RS	374810	400855	Y	01/01/1999		Link
STK5	Stockport Hazel Grv	NO2 PM10	RS	391481	387637	Y	12/04/2005		Link
STK4 STK6	Stockport Shaw Health	NO2 PM10	UB	389384	389605	Y	09/10/2002	06/02/2011	Link
TAM1	Tameside Mottram M'r	NO2 PM10	RS	399719	395804	Y			Link
TAME	Tameside Two Trees Sch	NO2 O3 PM10	UB	393454	394330	N	09/12/1998		Link
TRAF	Trafford	NO2 PM10 SO2	UB	378783	394726	N	01/11/1998		Link
TRF2	Trafford A56	NO2 PM10	RS	379413	394014	Y	30/09/2004		Link
WIG6	Wigan Leigh 2	NO2 PM10	UB	366290	399861	N	01/01/2006	10/08/2012	Link

Notes: F: FDMS, P:Partisol;
Roadside (RS), Kerbside (KS), Rural (RU), Urban Background(UB), Suburban, (SU), Urban industrial (UI), Urban Background (UB)and Urban Centre (UC)
Source: GMAQN\Automatic\GIS\GMAQNSites.xlsx

Figure 2.1 Map of Automatic Monitoring Sites



2.1.2 Non-Automatic Monitoring Sites

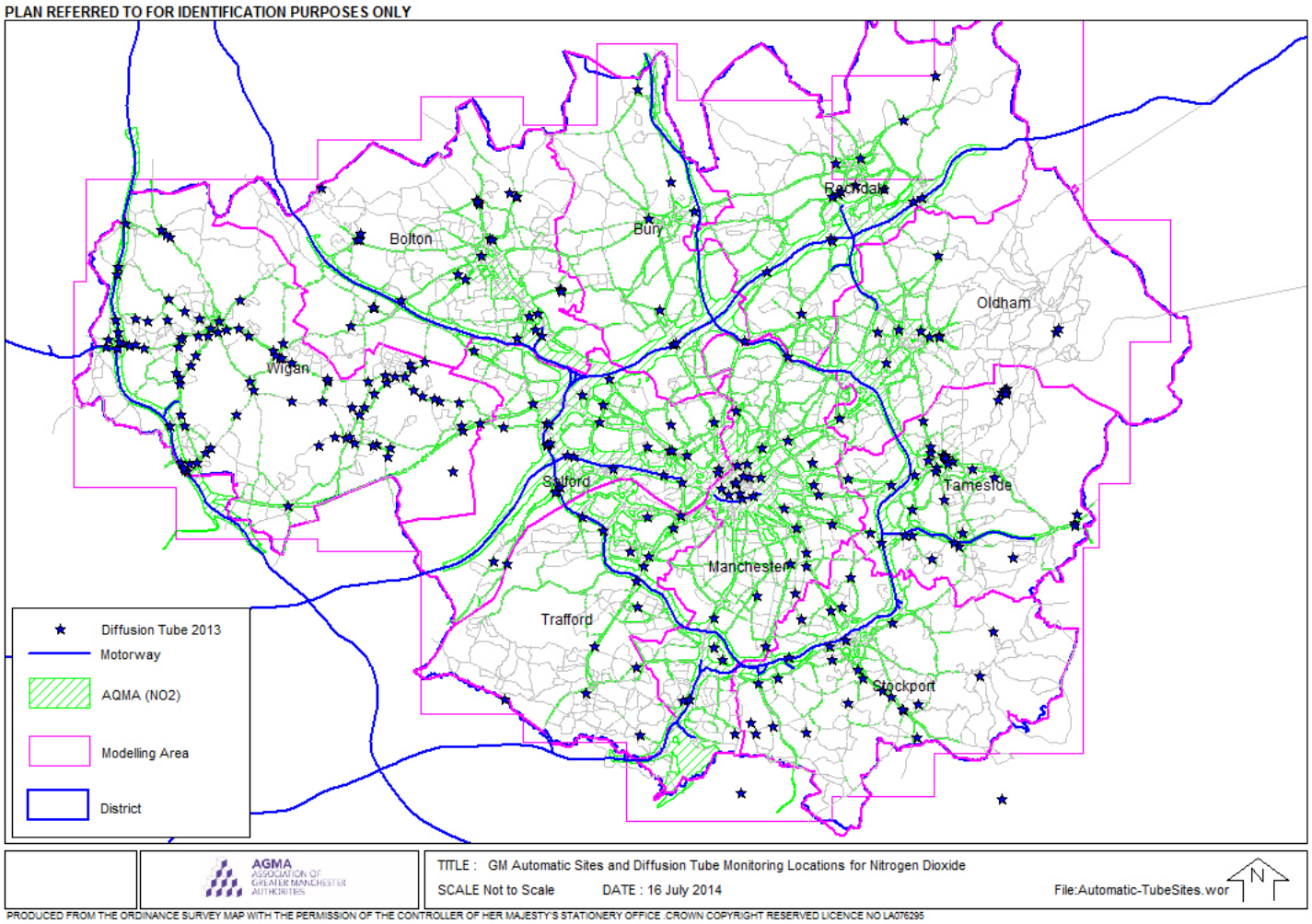
Details of Non-Automatic Monitoring Sites are listed in Appendix 2. Non automatic monitoring network using nitrogen dioxide diffusion tubes supports the information from automatic stations providing annual means and a larger data set for trend analysis across various site environments. The following information has been collated from the 10 districts using previous reports from their own data sets for the period 2007 to 2010. If you require further information about specific aspects of diffusion tube monitoring please contact the local authority directly. From 2011 the diffusion tube data are processed as a single data set with single bias factor for each year.

Table 2.2 summarises the site types in the Greater Manchester by district. The site classification types are summarised using the DEFRA site criteria Roadside (Rs), Kerbside (Ks), Rural (RU), Urban Background (UB), Suburban, (Su), and Urban Centre (UC). See Technical Guidance LAQM.TG(09) page 160. Figure 2.2 shows the monitoring locations in Greater Manchester for tubes reported in 2013.

Table 2.2 Summary of Non- Automatic Diffusion Tubes by Site Type

District	Kerbside	Roadside	Rural	Suburban	Urban Background	Urban Centre	Total
Bolton	2	7			12	1	22
Bury	2	3			3		8
Manchester	9	7		2	9	4	31
Oldham	1	2			4		7
Rochdale		9	1		4	2	16
Salford	2	19			8		29
Stockport		9	2		15	1	27
Tameside	5	24		3	8		40
Trafford	2	4	1		3	6	16
Wigan		70			3	1	74
Total	**23**	**154**	**4**	**5**	**69**	**15**	**270**

Figure 2.2 Map of Non-Automatic Monitoring Sites



2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

In 2013 the Greater Manchester Air Quality Network (GMAQN) operated 14 nitrogen dioxide chemiluminescence monitors. The annual mean nitrogen dioxide results are provided in Table 2.4 which details the results from 2007 to 2013 and Figure 2.3 shows the trends.

The following stations were decommissioned during 2011/12

- Bolton College, Oldham West End, Stockport Shaw Heath in 2011
- Wigan Leigh 2, Bury Roadside in 2012

The Bury roadside, decommissioned by DEFRA as if did not meet EU site criteria side, was relocated in 2014 to the A56. No sites were closed in 2013. Bury Radcliffe and Prestwich were re-commissioned in 2011.

Sites with low data capture have been annualised using the method given in LAQM Technical Guidance TG(09). A suite of 9 to 10 AURN background sites within a 50 mile radius of central Manchester were used to derive a factor for the annual mean to period mean for the relevant year. Table 2.3 gives the factors for the adjusted sites.

Table 2.3 Annual Mean Adjustment of NO2 Automatic Monitoring for NO_2 with Low Data Capture.

Code	Name	Year	Data Capture	Site Mean	Factor	Annualised mean
Bury	Bury Roadside	2012	58.4	56	1.02	57.4
WIG6	Wigan Leigh2	2012	60.6	25	1.04	25.9
TAM1	Tameside Mottram Moor	2013	24	37	0.95	35.1
TAME	Tameside Two Trees School	2013	57.6	18	0.95	17.1
TRF2	Trafford A56	2013	45.1	47	0.84	39.3
Source: \\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\WIP\Anal\output\fac-site.xlsx, \\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\WIP\Anal\Sitename.r						

Figure 2.3 and Figure 2.4 show a downward trend over the period with non roadside sites generally falling below the air quality objective of 40 µg/m^3. Nonetheless three locations are above the air quality objective in 2013 and two are just below it. All are

in the AQMA. Salford M60 recorded the highest concentration at 61 µg/m^3 (88% data capture) and has remained fairly constant from 2010. The air quality station is a motorway site with some of the highest traffic flows on the M60 carrying traffic between Liverpool and Hull. Manchester Oxford Road is the second highest site with 55µg/m3; compared to 2012 there has been a fall of 7 µg/m^3 in the roadside levels. Oxford road is one of the main corridors from south Manchester in to the city centre with two major Universities, student accommodation and a teaching hospital making it one of the busiest commuter routes in Europe with a high proportion of buses.

Four automatic sites are in the AQMA with concentrations ranges between 26 µg/m^3 to 35 µg/m^3. For sites outside the AQMA, concentrations range from 15 µg/m^3 to 25 µg/m^3.

Table 2.5 shows the number of hourly exceedences above 200 µg/m3 with 99.8 percentile in brackets for some years. The hourly air quality objective was not exceeded as no site had more than 18 exceedences in 2012 or 2013. The number of exceedences across the network has fallen considerably compared to 2012 with the greatest number of exceedences recorded by the two roadside sites, M60 and A56 with 4 and 7 hourly exceedences respectively.

The 99.8 percentile is a useful indicator to compare against the 200 µg/m^3 for sites with low data capture. If the 99.8 percentile is above 200 µg/m^3, then the hourly standard is likely to be exceeded. No sites have a 99.8 percentile above 200 µg/m^3 in 2012 and 2013 supporting the above finding that the hourly standard is not exceeded in Greater Manchester.

Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective of 40 µg/m^3

Unit: µg/m^3

AURN Code	Site ID	Site Type	In AQMA	2007		2008		2009		2010		2011		2012		2013	
				Conc	%	Conc	%	Conc	%	Conc	%	Conc	%	Conc	%	Conc	%
BOLT	**Bolton College**	UB		-	-	25	75	27	84	28	91	29	23	-		-	
BURY	**Bury Roadside**	RO	Y	**65**	81	**69**	96	**72**	83	**69**	99	**71**	89	**57**	58	-	
BUR2	**Bury Prestwich**	RO										**46**	99	**48**	89	**45**	92
BUR1	**Bury Radcliffe**	RO										30	99	28	88	26	98
GLAZ	**Glazebury**	RU		18	97	17	49	16	94	19	99	18	97	19	76	15	99
MAN1	**Manch Oxford Rd**	KE	Y	-	-	-	-	-	-	**64**	77	**66**	94	**62**	95	**55**	84
MAN3	**Manch. Piccadilly**	UC	Y	**44**	96	**43**	78	**42**	92	**45**	95	**44**	97	**41**	89	39	94
MAN8	**Manchester South**	SU		21	86	24	92	24	96	28	99	23	99	24	97	22	92
OLDH	**Oldh'm West End**	UC	Y	31	99	32	89	30	98	33	89	31	50	-	-	-	
ECCL	**Salford Eccles**	UI	Y	34	91	36	92	39	65	**42**	86	33	87	28	89	30	98
M60	**Salford M60**	RO	Y	**63**	96	**68**	70	**70**	97	**60**	98	**64**	99	**62**	99	**61**	88
STK5	**Stockp't Hazel Grv**	RO	Y	29	61	30	46	31	78	36	55	24	79	29	94	30	90
STK6	**Stockp't Shaw H'th 2**	UB	Y	39	24	28	98	27	99	31	93	31	10	-	-	-	-
TAM1	**Tameside Mott'm M'r**	RO												-	-	35	24
TAME	**Tameside Two T's**	UB		19	94	19	95	19	89	24	68	21	90	19	100	17	58
TRAF	**Trafford**	UB		30	100	32	81	34	98	33	99	26	99	26	87	22	87
TRF2	**Trafford A56**	RO	Y	**42**	89	**46**	93	**44**	96	**46**	99	**41**	90	**49**	99	39	45
WIG6	**Wigan Leigh 2**	UB		27	93	26	100	25	95	29	92	25	96	26	61	-	-
WIG5	**Wigan Centre**	UB		22	96	24	99	24	99	26	99	23	98	24	100	25	98

Annual means annualised where data capture falls below 75 % (grey shading) see Box 3.2 TG(09). Bold standard exceeded, Orange 75 – 90%, Red < 75% data capture
Closures: Stockport Shaw Health 6/2/11; Oldham 5/7/11. Included in report for 2013 Tameside Mottram Moor
Roadside (RS), Kerbside (KS), Rural (RU), Urban Background(UB), Suburban, (SU), Urban industrial (UI), Urban Background (UB)and Urban Centre (UC)
Source: \\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\WIP\Gtr Manchester Summary.xlsm

Figure 2.3 Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

Sites above AQS marked with *

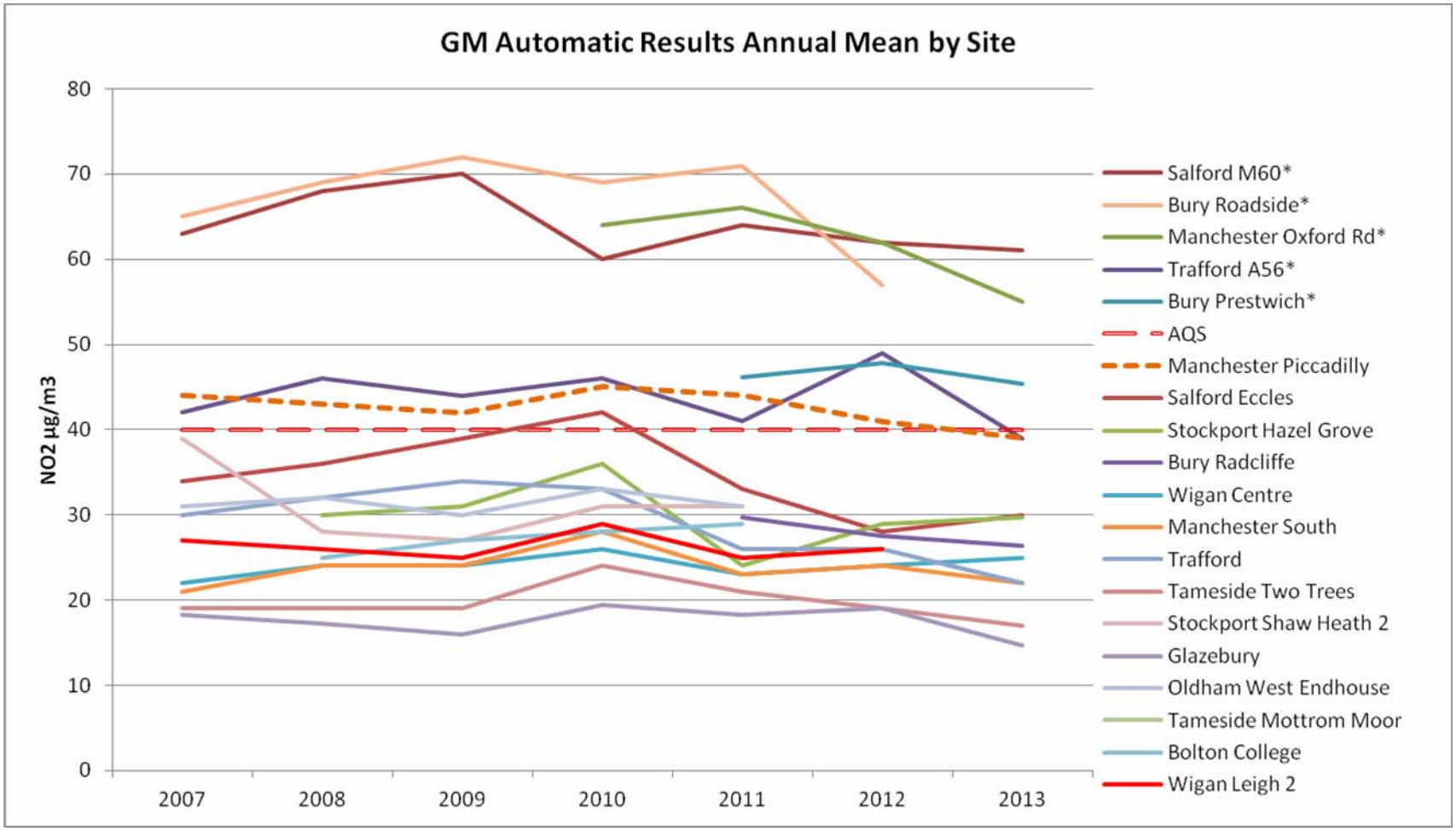


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Figure 2.4 Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring by Site Classification

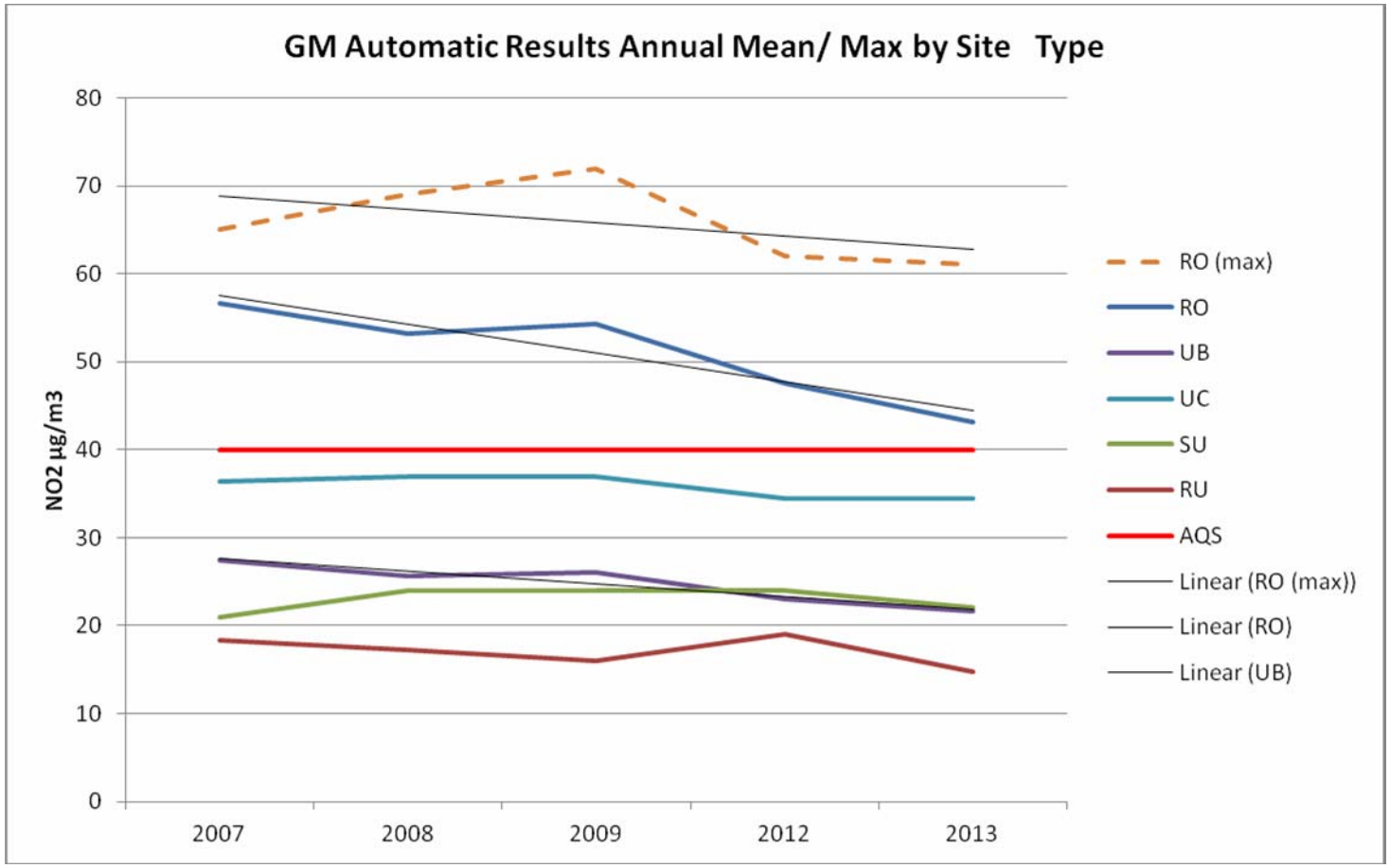

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Table 2.5 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

LA	AURNSite Code	Site ID	Site Type	In AQMA	Valid Data Capture 2013 % [a]	Number of Hourly Means > 200µg/m^3(98.8PC[b])						
						2007	2008	2009	2010	2011	2012	2013
Bolton	BOLT	Bolton College	UB			-	0	0	0			
Bury	BURY	Bury Roadside	RS	Y		3	4	11	23	7(189)	10 (199)	
BUR2	Bury	Prestwich	RS		91.9						0(151)	0(126)
BUR1	Bury	Radcliffe	RS		97.5						0(131)	0(114)
Salford	GLAZ	Glazebury	RU		98.8	0	0	0	0	0(84)	0(71)	0
Manchester	MAN1	Manchester Oxford Rd	KS	Y	83.6	-	-	-	2	5(166)	13 (181)	0(138)
Manchester	MAN3	Manchester Piccadilly	UC	Y	93.8	0	12	0	0	0(109)	0(101)	0(97)
Manchester	MAN8	Manchester South	SU		91.7	0	0	0	7	0(101)	0(109)	0(95)
Oldham	OLDH	Oldham West Endhouse	UC	Y		0	0	0	0	0(99)		
Salford	ECCL	Salford Eccles	UI	Y	98.2	0	3	0	15	0(136)	2(151)	0(123)
Salford	M60	Salford M60	RS	Y	88.1	47	65	106	13	13(195)	8(191)	4(187)
Stockport	STK5	Stockport Hazel Grove	RS	Y	89.8	1	0	0	4	0(195)	0(111)	0(109)
Stockport	STK6	Stockport Shaw Heath 2	UB	Y		0	1	0	5			
Tameside	TAM1	Tameside Mottram Moor	RS		24							0(141)
Tameside	TAME	Tameside Two Trees	UB		57.6	0	0	0	0	0(103)	0(78)	0(80)
Trafford	TRAF	Trafford	UB		87.4	0	2	0	18	0(113)	0(117)	0(86)
Trafford	TRF2	Trafford A56	RS	Y	45.1	0	2	0	12	0(132)	14(195)	7
Wigan	WIG6	Wigan Leigh 2	UB			0	0	0	0	0(88)	0(113)	
Wigan	WIG5	Wigan Centre	UB		98.1	0	0	0	0	0(82)	0(97)	0(86)

In bold, exceedence of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

Roadside (RS), Kerbside (KS), Rural (RU), Urban Background(UB), Suburban, (SU), Urban industrial (UI), Urban Background (UB)and Urban Centre (UC)

[a] i.e. data capture for the full calendar year ; [b] If the data capture for full year is less than 90%,the 99.8th percentile of hourly means (in brackets) is a useful predictor of possible exceedence of the .AQO

Diffusion Tube Monitoring Data

A summary of the diffusion tube results for 2007 to 2013, above 40 µg/m^3 by site type and by local authority, are presented in Tables 2.6, 2.7 and 2.8. A full data set is presented for all tubes in Appendix 2 and attached spreadsheets.

Diffusion tube monitoring is affected by several factors and the NO_2 concentrations are adjusted by comparing results from collocated tubes to a reference using a NO_2 continuous analyser. A bias factor is calculated using a spreadsheet provided by Ricardo–AEA. Bias factors are collated in a national database enabling a large number of factors at a range of different site locations using the same laboratory and analysis method. There is a choice of using a locally derived bias factor based on local data or using the national dataset. For 2012 and 2013 the national bias factor was selected as it is based on a larger number of studies, is compatible with results in 2011 and as shown below there is minimal difference between the two sets. National and locally derived factors are compared below:

National Factor
2013: 0.87 (from national database11 studies, Version: 03/14)
2012: 0.86 (from national database 13 studies, Version: 03/13)

Greater Manchester (local factor)
2013: 0.896 (from national database 6 studies, Version: 03/14)
2012: 0.869 (from national database 6 studies, Version: 03/13)

Although the local factor for 2013 is slightly higher at 0.896, the national factor was preferred as more studies are used and it was also used in 2012.

Where the data capture was less than 9 months the results were annualised using non roadside/ kerbside sites with 100% data capture by deriving a factor based on period means from either diffusion tubes or background automatic stations with good data capture to 12 month mean. In 2013, 37 tubes with less than 9 months were corrected using the diffusion tube approach.

To assess the difference between the two methods the average for the corrected data using automatic sites and tube data was compared for all the tubes adjusted in 2013. The average for tubes adjusted with automatic site data was 32.2 µg/m^3 compared with 31.7 µg/m^3 for the tube data. The difference between the two methods is very small and as the tube data is more representative of the area the tube based correction was used.

The results of NO_2 2013 Diffusion Tubes (template table no Table 2.5) and annual mean concentration adjusted for bias (template table no 2.6) are reported in Appendix 2 due to the large number of tubes in the data set. Table 2.6 shows that 39 locations exceeded the air quality standard, 37 of these were in the air quality management area. All districts except Oldham and Bolton recorded a location where the annual mean objective is exceeded. Tables 2.7 and 2.8 summarise the diffusion tube results by site type and local authority. Figure 2.5 plots the annual mean NO_2 concentrations trend by site type and indicates that sites with higher concentrations such as roadside, kerbside and urban centre have a larger fall off over the period. Figure 2.6 thematically maps diffusion concentrations across the conurbation. Sites with a triangle exceed the annual mean air quality objective in 2013 and are mainly located by major roads and in urban centres.

Table 2.6 Number of NO_2 Diffusion Tubes (2009 to 2013) over 40 µg/m^3

Row Labels	2007	2008	f 2009	2010	2011	2012	2013
Bolton	4	5	9	6	8	6	
Bury		3	6	6	3	2	2
MAN	12	18	17	22	18	16	11
Oldham	3	3	8	1	1		
Rochdale		7	6	6	6	5	4
Salford	7	9	14	15	6	7	5
Stockport	8	5	8	8	8	8	7
Tameside	11	14	11	8	11	8	4
Trafford	3	5		5		2	
Wigan	24	30	8	32	24	27	6
Total	**72**	**99**	**87**	**109**	**85**	**81**	**39**

Table 2.7 Results of NO_2 Diffusion Tubes (2009 to 2013) by site type

Average (min – max) Unit: µg/m^3

Site Type	2007	2008	2009	2010	2011	2012	2013
KS	55(36-81)	50 (33-85)	46 (31-71)	47 (31-72)	45 (30-68)	43 (30-66)	38 (29-61)
RS	40(22-66)	42 (23-75)	38 (24-73)	40 (24-82)	39 (25-73)	37 (24-61)	35 (23-68)
RU	18(9-27)	17 (8-27)	13 (9-17)	19 (11-30)	19 (10-39)	16 (9-20)	15 (10-18)
SU	23(19-27)	23 (15-29)	24 (17-29)	23 (19-28)	24 (17-29)	22 (15-26)	22 (14-27)
UB	27(15-47)	27 (13-45)	29 (15-48)	30 (17-53)	28 (15-45)	27 (16-45)	25 (11-45)
UC	42(28-53)	41 (30-51)	38 (27-48)	41 (31-52)	36 (24-47)	38 (27-51)	34 (26-43)
Average	37(9-81)	38 (8-85)	35 (9-73)	38 (11-82)	36 (10-73)	35 (9-66)	32 (10-68)

Roadside (RS), Kerbside (KS), Rural (RU), Urban Background(UB), Suburban, (SU), Urban Background (UB)and Urban Centre (UC)

Table 2.8 Results of NO_2 Diffusion Tubes (2009 to 2013) by Local Authority

Average (min – max) Unit: µg/m^3

LA	2007	2008	2009	2010	2011	2012	2013
Bolton	31(18-45)	30(16-53)	33(17-52)	31(17-49)	33(19-49)	32(16-45)	31(16-40)
Bury		44(29-69)	46(32-71)	50(33-82)	41(31-64)	39(27-59)	37(26-58)
MAN	51(22-81)	45(15-79)	42(17-71)	46(19-72)	41(17-68)	40(15-66)	37(14-61)
Oldham	38(20-72)	39(21-85)	47(29-66)	33(21-50)	32(25-45)	32(23-39)	27(18-33)
Rochdale		36(18-54)	34(11-52)	35(15-55)	36(16-56)	35(19-50)	32(18-49)
Salford	37(25-58)	40(25-68)	43(27-71)	42(32-64)	36(22-57)	34(24-51)	33(21-50)
Stockport	30(9-60)	27(8-55)	28(9-63)	32(11-66)	30(10-56)	31(9-61)	28(10-51)
Tameside	34(15-66)	37(17-75)	35(16-73)	34(18-60)	36(17-72)	33(16-59)	31(11-68)
Trafford	34(21-45)	34(20-45)	31(17-39)	37(23-46)	26(17-33)	31(20-46)	28(17-39)
Wigan	40(26-57)	41(26-65)	33(16-52)	38(25-57)	37(25-73)	35(25-51)	32(21-43)

Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

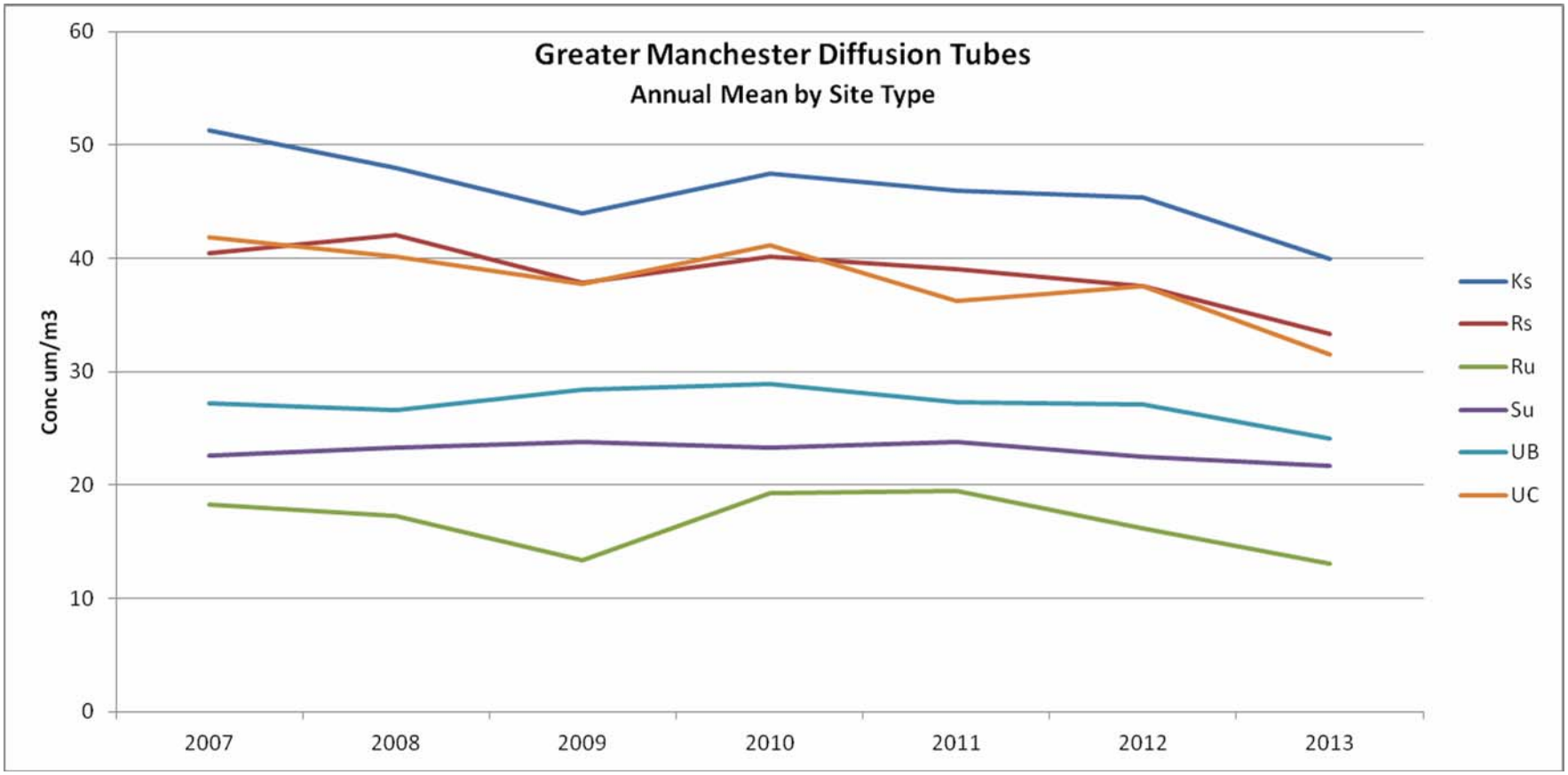
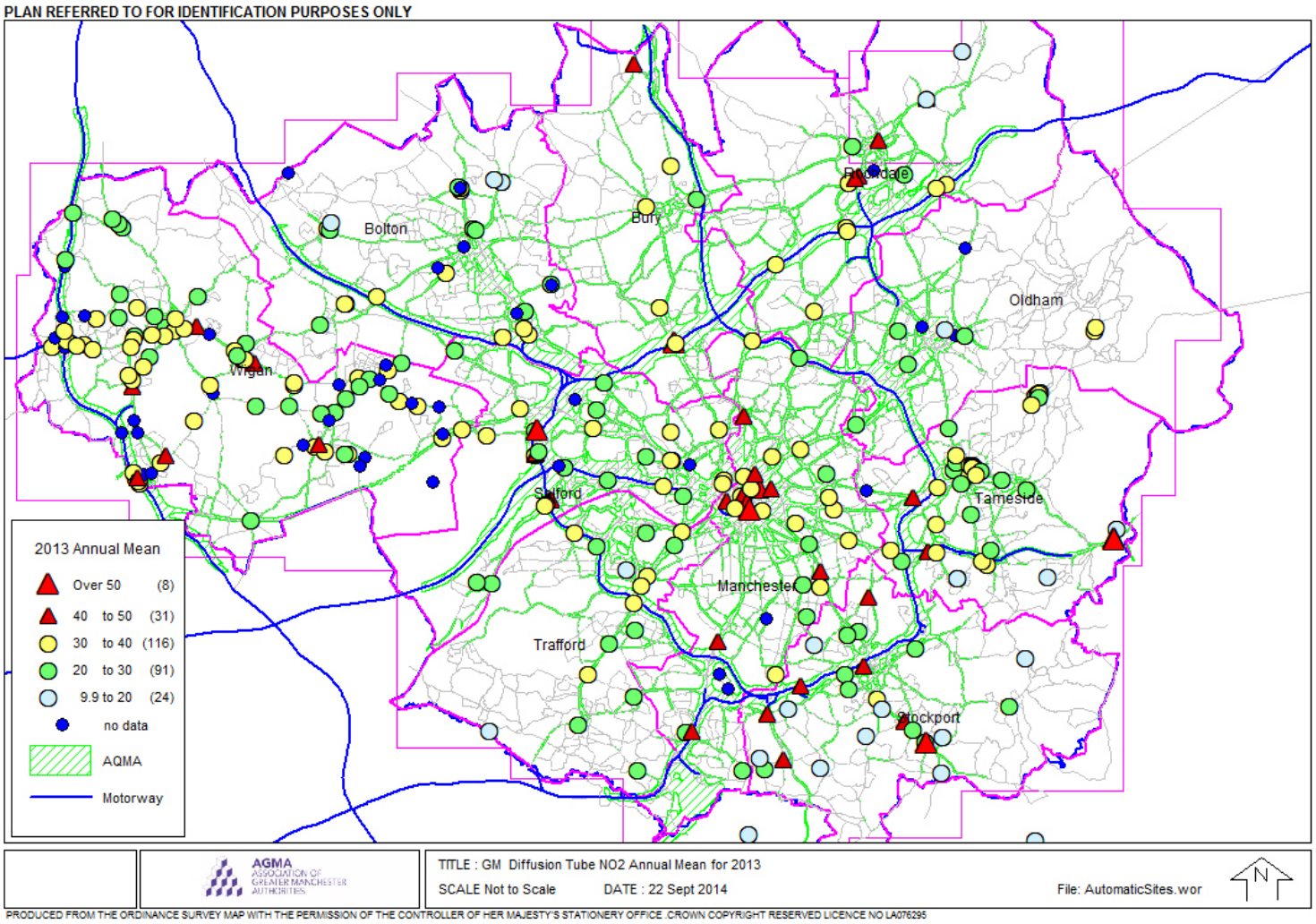


Figure 2.6 Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites for 2013



2.2.2 Particulate Matter (PM_{10})

Table 2.9 shows the annual mean PM10 for sites in Greater Manchester, as can be seen in Figure 2.7 there have been long term improvements but concentrations have remained consistent over the last few years. There are no sites that exceed the annual mean air quality objective.

Ricardo-AEA corrected the TEOM data using the volatile correction model provide by King's College London (KCL) and the BAM data by dividing by 1.2. TEOM data in the Ricardo-AEA spreadsheet prior to 2009 is corrected by 1.3 unless otherwise stated. FDMS and Partisol data does not required to be corrected.

Tameside Mottram Moor was with a data capture of 53% in 2013 was annualised using TEOM data at using four background sites as set out in LAQM Technical Guidance TG(09).

As expected, the roadside and kerbside sites remain higher than other sites in the network. The two highest sites record 26 µg/m^3 and 31 µg/m^3 at roadside locations, compared with 15 µg/m^3 seen at the site with the lowest concentration.

Table 2.10 summaries the results for the PM10 daily mean air quality objective; no site exceeds this objective.

2.2.3 Particulate Matter (PM2.5)

The results of the air quality measurements for PM2.5 for five sites in Greater Manchester are summarised in Table 2-9. PM2.5 is monitored using FDMS at four sites and a Partisol. No corrections are required. All results are within the Stage 2 limit value (20 µg m-3 to be achieved by 1st Jan 2020).

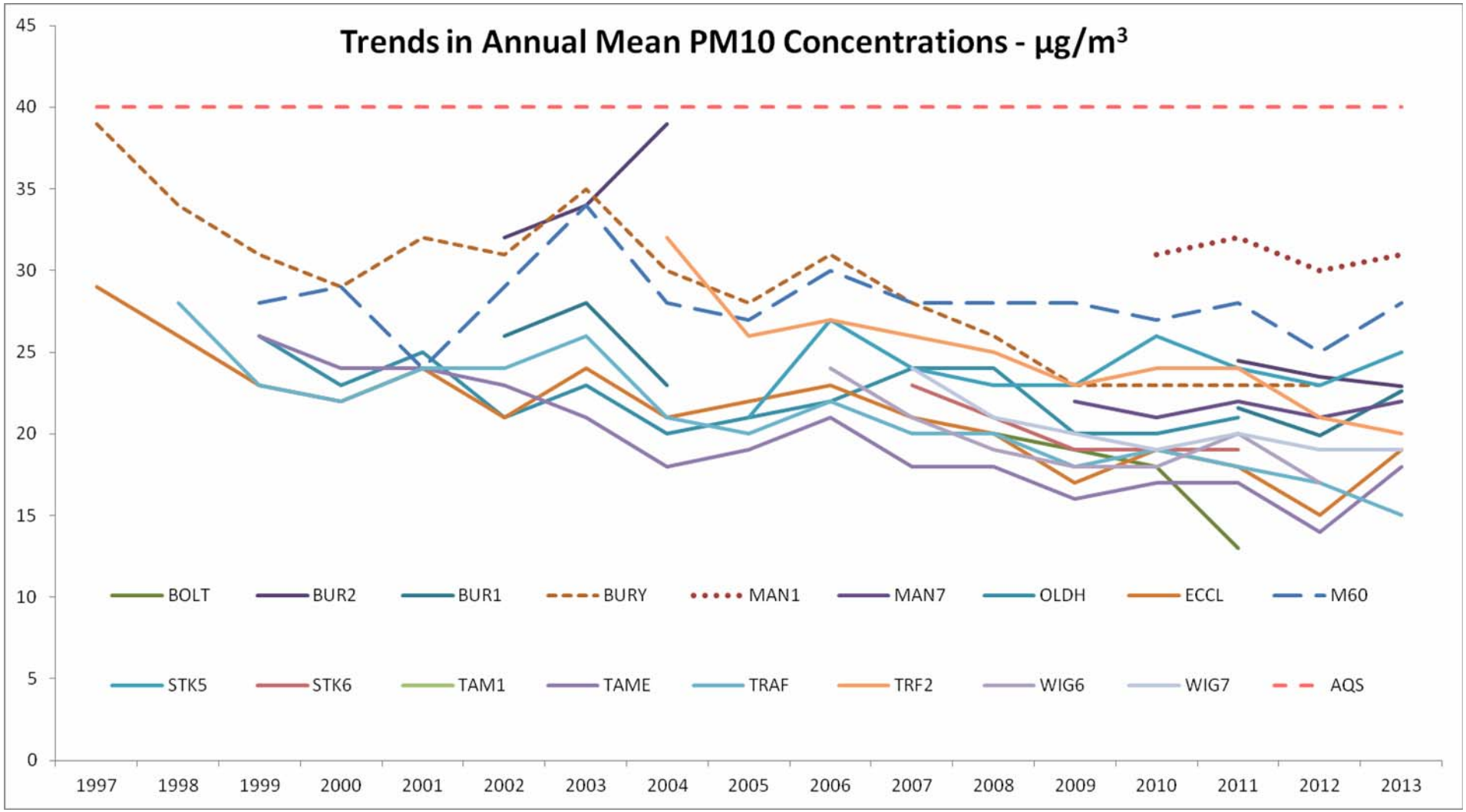
Table 2.9 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site	Site Code	Type	Method	Method	Data Capture (2013)	2009	2010	2011	2012	2013
Bolton College - closed 2011	BOLT	UB	TEOM	VCM	18.8	18	17	15		
Bury Radcliffe	BUR1	RS	TEOM	VCM	87.7			21.6	19.9	22.6
Bury Prestwich	BUR2	RS	TEOM	VCM	98.1			24.5	23.4	22.9
Bury Roadside AURN	BURY	RS	FDMS			23	23	**23**	**23**	
Oldham West Endhouse - closed 2011	OLDH	UC	TEOM	VCM		19	19	22		
Manchester Oxford Rd	MAN1	KE	BAM	GR	86.7		31	32	30	31
Manchester Piccadilly LA	MAN7	UC	BAM	GR	95.1	22	21	22	21	22
Manchester Sth		SU	P		99.5	18	16.6	15.3	13.4	15.4
Salford EcclesAURN	ECCL	UI	FDMS		98	17	19	18	15	19
Salford M60	M60	RS	TEOM	VCM	96.7	25	24	25	23	26
Stockport Hazel Grove	STK5	RS	TEOM	VCM	97.5	22	23	22	21	23
Stockport Shaw Heath 2 -closed 2011	STK6	UB	TEOM	VCM		18	18	18		
Tameside Mottram Moor	TAM1	RS	TEOM	VCM	A(53.3)					23
Tameside Two Trees	TAME	UB	TEOM	VCM	88.2	16	16	17	14	18
Trafford	TRAF	UB	TEOM	VCM	99.2	17	17	18	17	15
Trafford A56	TRF1	RS	TEOM	VCM	94.2	21	21	22	19	20
Wigan Leigh 2 - closed 10/08/12	WIG6	UB	TEOM	VCM		17	17	19	17	
Wigan Centre PM10	WIG7	UB	TEOM	VCM	96.4	19	18	19	18	19

FDMS: Filter Dynamic Measurement System;P:Partisol ; TEOM : Tapered Element Oscillating Microbalance
VCM: Volatile Correction Model , GR Gravimetric;
Data Capture: Where VCM correction applied the data capture for the modelled results is given and will differ from instrument data capture. A Annualised Partisol data supplied by Manchester CC.
Roadside (RS), Kerbside (KS), Rural (RU), Urban Background(UB), Suburban, (SU), Urban industrial (UI), Urban Background (UB)and Urban Centre (UC)
Source: \\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\Gtr Manchester Summary_Updated_June14_V1 - teom.xls

Figure 2.7 Trends in Annual Mean PM_{10} Concentrations

(Teom (gravimetric) and FDMS data)



\\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\Gtr Manchester Summary_Updated_June14_V1 - teom.xls

Table 2.10 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Year	Site Code	Type	Method	Correction	2009	2010	2011	2012	2013
Bolton College	BOLT	UB	TEOM	VCM	0	0	0		
Bury Prestwich	BUR2	RS	TEOM	VCM			19	14	8
Bury Radcliffe	BUR1	RS	TEOM	VCM			15	11	9
Bury Roadside AURN	BURY	RS	FDMS		7	2	14	14	
Manchester Oxford Rd	MAN1	RS	BAM	GR		17	33	28	21
Manchester Piccadilly (AURN/LA)	MAN7	UC	BAM	GR	6	1	8	11	7
Manchester South		SU	P	GR	11	4	5	7	6
Oldham West Endhouse	OLDH	UC	TEOM	VCM	1	1	0		
Salford Eccles AURN	ECCL	UI	FDMS		6	3	13	6	6
Salford M60	M60	RS	TEOM	VCM	10	8	12	16	19
Stockport Hazel Grove	STK5	UB	TEOM	VCM	9	15	23	20	12
Stockport Shaw Heath 2	STK6	UB	TEOM	VCM	3	0	0		
Tamseside Mottram Moor	TAM1	RS	TEOM	VCM					0
Tameside Two Trees	TAME	UB	TEOM	VCM	1	0	2	1	3
Trafford	TRAF	UB	TEOM	VCM	2	3	2	2	0
Trafford A56	TRF1	RS	TEOM	VCM	3	3	6	3	1
Wigan Leigh 2	WIG6	UB	TEOM	VCM	0	2	4	0	
Wigan Centre AURN /LA	WIG7	UB	TEOM	VCM	1	2	3	3	1

FDMS: Filter Dynamic Measurement System; P:Partisol TEOM : Tapered Element Oscillating Microbalance;
VCM: Volatile Correction Model from 2009, GR Gravimetric;
Data Capture: Where VCM correction applied the data capture for the modelled results is given and will differ from instrument data capture.
Partisol data supplied by Manchester CC.
Source: \\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\Gtr Manchester Summary_Updated_June14_V1 - teom.xls

Table 2.11 Results of Automatic Monitoring for PM2.5: Annual Mean Result

Site	Method:	Data Capture	2008	2009	2010	2011	2012	2013
Bury Roadside AURN	**FDMS**			14	17	19	19	
Manchester Piccadilly AURN	**FDMS**	79.1		12	18	14	14	12
Salford Eccles AURN	**FDMS**	98.2	20	14	15	16	13	15
Wigan Centre AURN	**FDMS**	96.2	28	14	20		9	13
Manchester South	**Partisol**	89.9		9.4	10.5	10.0	9.0	10.2

2.2.4 Other Pollutants

Previous monitoring results for the following pollutants have shown that concentration levels in Greater Manchester are consistently below the relevant air quality objective. Therefore reporting of these pollutants has been discontinued. Data is available on request from the local authority.

- Sulphur Dioxide
- Benzene
- 1,3 Butadiene
- Lead
- Carbon Monoxide

2.2.5 Summary of Compliance with AQS Objectives

This report has examined the results from monitoring in the 10 districts of Bury, Bolton, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford, and Wigan. Annual mean nitrogen dioxide in the AQMA remain above the air quality objective and therefore the AQMA should remain.

Assessments of the hourly mean nitrogen dioxide objective and the PM10, annual and daily objectives are not exceeded.

3 New Local Developments

3.1 Road Traffic Sources

Each of the 10 Greater Manchester authorities committed to undertaking a detailed air quality review and assessment in relation to road traffic following the last updating and screening assessment in 2009. The dispersion modelling has been delayed due to difficulties in obtaining accurate emissions data, particularly for some point sources and also because new road transport emission factors were due to be published, which are expected to be more representative of real world .

The detailed assessment is currently being completed and will be submitted later in 2015. Road traffic emissions will be considered as part of the detailed assessment.

For the Progress Report authorities in Greater Manchester have been asked to identify and roads traffic sources that have not previously been assessed either in reports that have been submitted previously or in the detailed assessment that is currently being written. This has been based on local knowledge of any major changes to road traffic flows and any significant developments (e.g. new road or bus stations) which have been constructed since the last report was submitted.

Table 3.1 Road Traffic Sources

Source Type	Local Authority	New or Previously not Assessed Sources Identified?	Air Quality Assessment Carried Out as Part of Environmental Statement?	Outcome of the Environmental Statement
Narrow Congested Streets with Residential Properties Close to the Kerb	All 10 Greater Manchester Authorities	No	No	N/A
Busy Streets Where People May Spend 1 hour or More Close to Traffic	All 10 Greater Manchester Authorities	No	No	N/A
Roads with a High Flow of Buses and/or HGVs	All 10 Greater Manchester Authorities	No	No	N/A

Source Type	Local Authority	New or Previously not Assessed Sources Identified?	Air Quality Assessment Carried Out as Part of Environmental Statement?	Outcome of the Environmental Statement
Junctions	All 10 Greater Manchester Authorities	No	No	N/A
New Roads Constructed or Proposed Since the Last USA	Bolton Bury Oldham Manchester Rochdale Trafford Tameside Salford Stockport	No	No	N/A
	Wigan	Yes (Southgate)	No	N/A
Roads with Significantly Changed Traffic Flows	All 10 Greater Manchester Authorities	No	No	N/A
Bus and Coach Stations	All 10 Greater Manchester Authorities	No	No	N/A

3.2 Other Transport Sources

Each of the 10 Greater Manchester authorities have identified any new other transport sources that have not previously been assessed either in reports that have been submitted previously or in the detailed assessment that is currently being written. This has been based on local knowledge of any major changes to airports, railways (diesel and steam trains - stationary and moving) and ports (shipping) since the last report was submitted. The results are presented in Table 3.2.

Table 3.2 Other Transport Sources

Source Type	Local Authority	New or Previously not Assessed Sources Identified?	Air Quality Assessment Carried Out as Part of Environmental Statement?	Outcome of the Environmental Statement
Airport Railways – Stationary Trains Port	Bolton Bury Manchester Oldham Rochdale Salford(1) Stockport Tameside Trafford Wigan	None	N/A	N/A
Salford: see Western Gateway Infrastructure (WGIS)				

Salford: **Western Gateway infrastructure (WGIS)**

The Western Gate Infrastructure (also known as Port Salford) is a multi-modal freight facility interchange for distribution/ warehousing with road, rail and canal access. Small freight carrying ships will access the facility via the Manchester Ship Canal and berth at Port Salford. Construction of the site commenced in 2013 and is expected to be completed in 2015. The planning application and air quality assessment were considered in Salford's 2009 Updating and Screening Assessment (USA). The development is included in the Greater Manchester Emissions Inventory (EMIGMA) and out latest dispersion modelling of Greater Manchester. No detailed assessment is required.

3.3 Industrial Sources

In England Industrial sources are controlled by the Environment Agency (EA) and by local authorities under the Pollution Prevention and Control Regulations. Local authorities also have controls over 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 to local

authorities under the Local Air Quality Management (LAQM) regime. Many of these sources will have been addressed during previous rounds of Review and Assessment. The focus should thus be on new installations and those with significantly changed emissions.

While the number of sources that may be significant is limited, there is a wider range of pollutants to be considered.

For the purpose of this report we will divide industrial sources into four sections:

- Industrial installations;
- Major fuel (petrol) storage depots;
- Petrol stations; and
- Poultry farms.

Industrial sources are unlikely to make a significant local contribution to annual mean concentrations, but could be significant in terms of the short-term objectives. The approach to the assessment will depend on whether an assessment has been carried out as part of the planning or permitting process. The assessment should consider all of the regulated pollutants although those most at risk of requiring further work are SO2, NO2, PM10 and benzene.

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

A review of industrial processes in Greater Manchester has produced the following table 3.3.

Table 3.3 New or Proposed Installations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial (New / Proposed Installations with Air Quality Assessment)	Bury Bolton Manchester Oldham Rochdale Stockport Trafford	No	No	N/A	N/A
	Salford Trafford	Yes	No	N/A	N/A

Salford

20 MW Barton Biomass Renewable Energy Plant
Trafford Planning Ref: 76153/FULL/2010
Environment Agency Ref EPR/SP3234HY/A001

Peel Energy submitted a planning application to Trafford (Ref-76153/FULL/2010) for a 20 MW biomass plant, located on the boundary with Salford. Salford provided comments on the planning application and on the Part A permit application. Comments to the Environment Agency on the likely adverse impact of the facility were:

- it would worsen air quality in an area that already significantly exceeds the annual mean air quality objective for nitrogen dioxide and
- delay the attainment of the EU limit value and
- prevent progress on Salford's Air Quality Action Plan (AQAP).

The Environment Agency considered these points and others, concluding that "*even assuming that the existing background levels might exceed the EU EQS the process contribution is negligible when compared to the existing air quality*". EQS = Environmental Quality Standard. Ref: letter to Salford City Council (M/95814/No14)

dated 25 July 2012 EPR/SP3234HY/A001. Approval was given for the operation of the plant.

Island Gas Exploratory Shale Gas Exploratory Well
Environment Agency Ref EPR/AB3709LD/A001

The application was for a license to drill two exploratory wells to evaluate the potential resources of methane in the locality over a short period. The application included an air quality assessment of the likely impact of the operations on the surrounding environment and found no significant effect.

Trafford

20 megawatt biomass fuelled renewable energy plant
Planning Ref-76153/FULL/2010

Planning permission for the development was granted by the Secretary of State. This followed a planning appeal after the original application by Peel Energy was dismissed by the Council. The site is a Part A permitted process regulated by the Environment Agency.

Site for exploration, production testing and extraction of coal bed methane
Planning ref-81446/RENEWAL/2013

This application included a combined heat and power facility, erection of temporary 34m high drilling rig and formation of two exploratory boreholes. No decision has yet been made on this application.

Carrington Power Station, Carrington Combined Cycle Gas Turbine (CCGT) Power Station. The power station is located on Manchester Road, Carrington, Trafford.

The Section 36 consent for the project was granted in 2008. The site is currently being developed with first firing hoped to be in 2015.

The impact of the proposed development on nitrogen dioxide concentrations at the most affected residential receptors near roads within the Air Quality Management Area was assessed as “slight adverse”. This is likely to be acceptable provided that other measures in the Greater Manchester Air Quality Action Plan are sufficient to reduce the nitrogen dioxide concentration to levels below the air quality objective irrespective of the operation of the power plant.

There are several new or proposed industrial developments that may affect air quality in the area. These include the SAICA paper mill, the Barton biomass plant and the Carrington II power station.

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

The review and assessment process recommends that Local Authorities determine whether any industrial sources identified during previous rounds of review and assessment have either:

a) experienced substantially increased emissions (greater than 30%); or
b) received new relevant exposure in their vicinity.

A review of industrial process in Greater Manchester has found no installations that increased emissions substantially or introduced new relevant exposure.

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

A review of new or significantly changed installations in Greater Manchester with no previous air quality assessment has produced the following table:-

Table 3.4 New or Significantly Changed Installations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Industrial (New Installation / Increased Emissions without Air Quality Assessment)	Bury Bolton Oldham	Yes	No	N/A	N/A
	Manchester Rochdale Salford Stockport Tameside Trafford Wigan	No	No	N/A	N/A

Bolton

The following processes were identified. Approach 3 in Section C.1 of box 5.5 of TG(09) was followed, and none of the new industrial installations are associated with air pollutant emissions which are potentially significant in terms of air quality.

- Tumble Dwyers and Farnworth Dry Cleaners,, new processes - no exceedence predicted

Bury

There are five new or changed processes since 2012 and none of these have significant emissions to air.

Oldham

- Axiom Displays, Mersey Road North, Failsworth, M35 9LT. An application for a permit for a timber manufacturing installation was received in May 2014. This has not been determined yet. No air quality assessment has been provided as part of the application, if approved emissions from the site will be controlled by the use, and if necessary enforcement, of permit conditions.
- Neild Street Garage, Neild Street, Oldham, OL8 1QG. A permit was issued for a waste oil burner (<0.4 mW) at this site in January 2014. An air quality assessment was not included as part of the application. Controls are in place through the site permit, which was issued using the Process Guidance Note for this type of installation.
- DC Cook, Middleton Road, Chadderton, Oldham. A permit was issued for a waste oil burner (< 0.4 mW) at this site in January 2014. An air quality assessment was not included as part of the application. Controls are in place through the site permit, which was issued using the Process Guidance Note for this type of installation.
- Ferguson Polycom, Drury Lane, Chadderton, Oldham. A permit was issued for a rubber and textile coating installation at the site in August 2012. The site is not yet fully operational. An air quality assessment was not carried out, but measures are in place through the environmental permit for the site to control air quality from the site.

3.3.4 Major Fuel (Petrol) Storage Depots

Since the last report there are no new or previously not assessed storage depots.

3.3.5 Petrol Stations

An assessment of appropriate petrol stations in Greater Manchester has produced the following table:-

Table 3.5 Petrol Stations

Source Type	Local Authority	New or previously not assessed sources identified?	Detailed Assessment required?	Description of Area to be assessed	Pollutants and objectives to be assessed
Petrol Stations	Bolton	Yes	No	N/A	N/A
	Bury Manchester Oldham Rochdale Stockport Tameside Trafford Wigan	No	No	N/A	N/A

Bolton

The following processes were identified. Section C.3 of TG(09) was followed, and none of the new industrial installations are associated with air pollutant emissions which are potentially significant in terms of air quality.

- Bolton (Dawes) Petrol Station new processes - no exceedence predicted.

3.3.6 Poultry Farms

An assessment of poultry farms in Greater Manchester has found no there are no new or identified sources.

3.4 Commercial and Domestic Sources

Table 3.6 Commercial and Domestic Sources

Source Type	Local Authority	New or Previously not Assessed Sources Identified?	Air Quality Assessment Carried Out as Part of Environmental Statement?	Outcome of the Environmental Statement
Biomass Combustion (Individual) Biomass Combustion (Combined) Domestic Fuel Burning	Bolton Bury Manchester Oldham Rochdale Salford Stockport Tameside Trafford Wigan	NO	N/A	N/A

3.5 New Developments with Fugitive or Uncontrolled Sources

Table 3.7 Fugitive or Uncontrolled Sources

Source Type	Local Authority	New or Previously not Assessed Sources Identified?	Air Quality Assessment Carried Out as Part of Environmental Statement?	Outcome of the Environmental Statement
Fugitive or Uncontrolled Sources	Bury	YES	YES	NOT SIGNIFICANT
	Bolton Manchester Oldham Rochdale Salford Stockport Tameside Trafford Wigan	NO	N/A	N/A

Bury Council

A planning application was received for the revised restoration of Fletcher Bank Quarry involving the further importation of inert waste to December 2036. This is an

extension to existing activities and the air quality assessment submitted with the planning application indicated that the impact would be insignificant. These conclusions were accepted by the council.

This chapter of the report confirms than in the 10 GM Districts that there are no new or newly identified local developments which may have an impact on air quality within the their areas.

The 10 local authorities confirm that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

Local \ Regional air quality strategies provide an opportunity for local authorities to set out the key air quality issues in the region and the principles for improving air quality while taking into account regional and national policies. Local authorities are responsible for a number of functions that may affect air quality and are therefore in a position to influence local measures to improve air quality.

The 10 Greater Manchester Authorities have formed a combined authority to improve governance on policies and strategies for the city region. The Greater Manchester Combined Authority (GMCA) has the same powers as the local authorities in respect of the air quality powers under Section 82 to 84 of the Environment Act 1995 to review, and access air quality and declares and undertake duties in an air quality management area.

The Greater Manchester Officers continue to work under the auspices of the Public Protection Managers as they develop and promote polices for reporting and improving air quality in the region. The group is well established and meets at regular intervals. The GMCA will take an increasing lead in co-ordaining air quality polices with transport and the low carbon economy.

The first Greater Manchester Air Quality strategy was set out in 2002 with the Greater Manchester Air Quality Management Strategy ‘Clearing the Air’. This set the scene for developing the Greater Manchester Air Quality Action Plan, which was published in 2004. Following guidance to link air quality strategies with Local Transport Plans, where transport was the main contributor, key air quality objectives were transposed into Local Transport Plan 2011-2016 (LTP3). The Air Quality Local Transport strategy sets out the steps to reduce emissions associated with local transportation in Greater Manchester.

The air quality strategy is embedded in the LTP cycle, is reviewed in five yearly cycles and the current LTP plan is available on line at:

http://www.tfgm.com/ltp3/documents/Greater_Manchester_Local_transport_Plan_Core_Strategy.pdf

Poor air quality has a real and significant effect on people's lives and on the economy as a whole. Across the UK, current estimates are that up to 35,000-50,000 people die prematurely from exposure to air pollution. Our principal aim is substantially to reduce the negative impacts of air pollution on health and the environment in Greater Manchester. Whilst in the short and medium term the priority is to meet statutory limits for major pollutants in all areas, the longer term aims are to promote the image of Greater Manchester as a progressive city region with a high quality environment and to reduce the contribution of air pollution to poor health in deprived areas (which can compound and propagate the problems of deprivation). The encouragement of active travel modes will assist in reducing emissions whilst simultaneously improving air quality and the health and productivity of our residents.

Currently many areas within the conurbation, as in many other urban areas across the UK, exceed EU thresholds for nitrogen dioxide (NO2) concentrations and the requirement to meet these limits in all areas by 2010 has not been met. Current forecasts commissioned by Department for Environment, Food and Rural Affairs indicate that many parts of Greater Manchester and other urban areas will continue to exceed the limit values in 2015.

The Greater Manchester Air Quality Strategy and Action Plan (2006) set's out a wide reaching package of measures to address air pollution from road transport, accounting for more than 70% of all emissions of NO2 and PM10 (particulate matter) according to the 2010 EMissions Inventory for Greater MAnchester (EMIGMA). A particular focus of the strategy was to ensure that all areas of Greater Manchester would meet EU limits for NO2 in 2010. However, it is apparent that the action plan has made very little difference to NO2 concentrations at most road side locations, since the impact of the individual measures was dispersed across the conurbation. We therefore need to focus activity on the most beneficial options and to concentrate initiatives geographically.

Different modes contribute differently to emissions of NOx, carbon dioxide and particulates. Whilst cars constitute half of road transport emissions of carbon dioxide, 'other goods vehicles' (OGVs), including rigid and articulated HGVs, are the major contributors to NOx. The potential impact of measures targeted at OGVs is high, given that they represent only 6.5% of the total vehicle distance travelled on major roads (including motorways) in Greater Manchester. Although buses are responsible for a far smaller proportion of NOx emissions, these emissions are concentrated on congested urban corridors where the exposure of the population is high, which adds to their significance. The need to reduce NO2 concentrations in the short term will therefore require a focus on HGV and bus emissions.

In the longer term the approach will be to influence and integrate air quality strategy with parallel climate change strategy. The contribution of each mode to particulate emissions is similar to that for carbon, which means that measures to reduce carbon emissions will also reduce emissions of particulates.

The Greater Manchester overall strategy to improving air quality will be based on:

1. Increasing travel by sustainable modes,
2. Reducing acute pollution incidents from traffic,
3. Improving vehicle efficiency including vehicle and fuel technology and efficient driving techniques,
4. Encouraging smarter travel through improved fares, ticketing and information, management of demand for car travel and promotional campaigns,
5. Better integration of transport and new development,
6. Reducing trips by motor vehicles by improvements to public transport and to infrastructure for walking and cycling; and
7. Improving network efficiency.

The impact on air quality of a mode shift to public transport will be greatest on the main corridors to the Regional Centre, where passengers have access to newer buses, introduced through Quality Bus Corridor schemes, and Metrolink, which is pollution free at the point of usage. Elsewhere, the picture is complicated by the fact that many buses perform poorly in environmental terms, but our proposals to raise the quality of bus vehicles, in partnership with operators, will be beneficial in terms of

air quality. Different types of diesel train use different quantities of fuel, and the better quality diesel trains we are seeking in order to improve passenger comfort will use more fuel per passenger mile. Electrification is always better in air quality terms, and we will continue to support, and lobby for, further electrification of the rail network. The Manchester - Liverpool line will be electrified by December 2014 as part of northern hub to improve the network infrastructure supporting the economy and low carbon strategies. The approach to managing the highway network aims to reduce the variability of journey times and maximise efficiency of the network. Reducing congestion will cut emissions by reducing the need for excessive acceleration and deceleration or for travelling at slow speeds, at which engine performance is sub-optimal. However, this may not be the case in all instances and so impacts on air quality need to be understood in the context of local conditions.

In the short term, options to reduce acute pollution incidents from traffic and to improve vehicle efficiency are or have included:

- an annual programme of vehicle emissions testing on major transport corridors;
- extending the enforcement of idling vehicles, which is already carried out in the Regional Centre, to town and district centres;
- targeted renewal of buses on routes into the Regional Centre and in adjacent areas where permitted levels of pollutants are exceeded;
- support/lobby central government for a national HGV scrappage scheme and work with the government on complementary regulation measures; and
- co-ordinate the uptake of Safe and Fuel Efficient Driving (SAFED) training for smaller freight and bus operators and promote continued updates to driving skills through a best practice scheme.

Through these policies a switch away from car use will contribute to improved air quality, reduced carbon emissions and the protection of biodiversity.

Despite good progress on these local actions, local air quality has not improved as anticipated by the use of cleaner vehicles. The reasons are complex but increases in the number diesel cars in the fleet and higher nitrogen dioxide emissions from vehicles have hindered air quality improvements. DEFRA are reviewing how to reshape local air quality management to address these issues by undertaking a review in England with a consultation in 2013, focussing on greater use of action plan

measures to tackle poor air quality. DEFRA expect to publish further guidance in 2014.

5 Planning Applications

5.1 Introduction

The impact of new developments on air quality is taken into account where local assessments have shown that national and European targets are exceeded or are near the limit or where there is an air quality management area. Local authorities in Greater Manchester will require the applicant to make a local assessment of the impact of the development where there is a likely impact. Each district sets it own policies and procedures for the assessment of planning applications. The assessment will include the impact of the development on the local area, potential new exposure and cumulative effects taking in to account existing and proposed developments. The sections below provide information on local planning applications with a significant impact on air quality in each district.

5.2 Bolton

87582/12 Waste Recycling Centre and Waste Transfer Station
Former Xcide Batteries, Salford Road

Change of use of car park to household waste recycling centre, erection of waste transfer loading station, site office and formation of new vehicular access

6999/12
Former Bradley Mill, Lever Street. Little Lever

Erection of supermarket together with car parking, access, landscaping and associated works

87438/12
Land bounded by Bollings Yard/ Johnson Street/Newport Street/ Great Moor Street (including the railway triangle), Bolton

Part A - Demolition of Unity Centre, New bus station and ancillary facilities, Pedestrian Bridge to rail station, 2 Detached operators buildings, cycle centre, public realm, landscaping, highway works and amendments to the Bolton interchange on Newport St

Part B – Future commercial development approved under outline application 83971/10 which will be the subject of a future reserved matters planning application

90539/13
Former Cutacre Opencast Mining Site, Land to the south of the A6 (Salford Road / Manchester Road West)

Part A : Outline application(access details only) for phased employment development scheme comprising up to 102Ha of storage and distribution use (class B8), industrial use (calss B2), associated / ancillary uses including business (classB1). Hotel (class C1), shops services and food and drink (class A1-A5) with associated access, utilities, ground works and sustainable drainage system.

Part B Full application for access and drainage infrastructure to serve initial phases(s) of development

5.3 Bury

A number of planning applications have been received for developments that have the potential to have a significant impact on air quality. The air quality assessments received with these applications have satisfactorily demonstrated that the developments will have a negligible or slight adverse impact on air quality. Although impacts were predicted to be small the developers were asked to take all reasonably practicable steps to mitigate any negative impacts on air quality.

5.4 Manchester

Sainsburys Supermarket Ltd
Heaton Park Road,
Blackley,
Manchester,

M9 0QS.
Erection of replacement Use Class A1 superstore and 1 no. new non-food shop unit (total gross internal floorspace of 14,306 sq. m, including 400 sq. m net for the non-food unit), with associated car parking area, relocated servicing road, landscaping and recycling facilities.

Gateway House,
Station Approach,
Ducie Street,
Manchester.
The refurbishment of Gateway House to create a 270 bedroom hotel with restaurant, bar and meeting rooms above a ground floor retail space for use for Class A1 (Shop) use or Class A2 (Financial and Professional Services) Use or Class A3 (Restaurant and Cafe) Use or Class A4 (Drinking Establishment) Use or Class A5 (Hot Food Take Away) Use, erection of new 7 storey office connected to Gateway House by bridge link, erection of new 3 storey gym and demolition of existing single storey building on Ducie Street.

Land Bounded By Ashton New Road, Score Street, Ashton Canal, Clayton Lane, Wilson Street And Alan Turing Way
Openshaw West,
Manchester.
Outline application for development comprising football training facilities, a 7,000-capacity Arena and ancillary Offices and Media Centre, 12 full-size and 2 half-size football training pitches, detached building forming accommodation for Youth Development and First Teams and incorporating two full size football pitches, a grounds maintenance building, Energy centre, pedestrian bridge across Ashton New Road linking to the Etihad Stadium, associated parking, landscaping, boundary treatments and other infrastructure works with all matters to be considered: and, Outline application for an Institute for Sports Medicine (a medical assessment, diagnosis and treatment centre, and research and product development facility in the fields of physiotherapy and sports science) and new Sixth Form College in the South West corner of the site with all matters reserved; following the demolition of all existing on site structures.

Elisabeth House,
2 - 14 St Peters Square,
Manchester,
M2 3DE
Redevelopment to create a 14 storey plus basement building incorporating Class B1 offices on upper floors, ground floor cafe, restaurant and bar uses (Class A3 and A4) and basement car parking with related highways, access, servicing and landscaping works, following demolition of existing building.

Howells Railway Products Ltd,
Sharston Industrial Area,
Longley Lane,
Northenden,
Manchester,
M22 4SS.
Erection of a two storey side extension to existing industrial building (B2) following demolition of detached single storey building.

Units 2-6,
Cheetwood Road,
Cheetham Hill,
Manchester,
M8 8AT.
Change of use to 7 ground floor and 1 basement wholesale cash and carry units (sui generis), with associated elevational alterations

5.5 Oldham

The following air quality assessments have been submitted in relation to planning applications in the Oldham area:

PA/335177/13 – Land at the junction of Henshaw Street and Lord Street. This is a planning application for the installation of a replacement boiler. The air quality assessment identified that there would be a slight adverse to negligible impact for

nitrogen dioxide and a negligible impact for PM10. Predicted air quality concentrations were all below the air quality limit values at all relevant locations. There are therefore no proposals to undertake further air quality assessments in relation to this development.

PA/334355/13 – Foxdenton Strategic site, Broadway/Foxdenton Lane, Chadderton, Oldham, OL9 9QR. This application is for a large mixed use development including a new road, offices, industrial use, residential and public open space. A decision on the application is pending. The air quality report submitted with the application identified a slight adverse at some receptor locations and a negligible impact at other locations. The impact on PM10 concentrations is negligible / not significant. If approved the development will be considered in future air quality reports.

PA/335177/14 – Land bound by Radcliffe Street, Park Street and Cardigan Street, Royton. This application is for the demolition of an existing pool and police station and the construction of a new leisure centre. The air quality impact identified that the development would have a negligible impact on air quality and that concentrations would all be below the air quality standards.

PA/335065/14 – Land bounded by Middleton Road, St. Domingo Street and Booth Street. This application is for the demolition of two public houses and the erection of a new leisure centre. The site was previously used as a food store, health centre and clinic. The air quality assessment identified that there would be a decrease in pollution concentrations as a result of the development. No exceedances of the air quality objectives have been identified.

5.6 Rochdale

NO INFORMATION RECEIVED

5.7 Salford

Urban Vision assess all major planning applications for Salford City Council. If necessary the Council will require the developer to put in place mitigation measures to reduce the impact of a development to protect new or existing residents in the

locality. Dust Management Plans are required on large schemes during construction and complaints are monitored by our Environmental Protection Team.

Major applications, meeting our validation criteria will require air quality assessments. Salford also provided comments to Trafford on impact of a 20 MW Biomass Plant at the planning stage (2011/12) and permitting stage (2012). The application was approved on appeal. Other applications had no significant air quality impacts in Salford. Monitoring programmes and review and assessment reports ensure that changes in local exposure are captured.

5.8 Stockport

Proposal: Construction of the A6 to Manchester Airport Relief Road (whole route), incorporating: Seven new road junctions;
Modification to four existing road junctions;
Four new rail bridge crossings;
Three new public rights of way/accommodation bridges;
Four new road bridges;
A pedestrian & cycle route;
Six balancing ponds; and
Associated landscaping, lighting and infrastructure works.

Within Stockport:

Six new road junctions;
Modification to three existing road junctions;
Three new rail bridge crossings;
One new public right of way/accommodation bridge;
Three new road bridges;
A pedestrian cycle route;
Four balancing ponds; and
Associated landscaping, lighting, engineering and infrastructure works.
Location: Land to the south of Stockport, adjacent to and between the A6 (Buxton Road) and land to the east of the Styal railway line, north of Styal Golf Course.

5.9 Tameside

Tameside's Environmental Protection Unit reviews all planning applications submitted to the authority. Where necessary, they will require the developer to implement measures to reduce any adverse impact the development will have on local air quality, protecting both existing and future residents in the area.

In 2012/13 there were no developments that had significant impacts on air quality.

5.10 Trafford

The Trafford Core Strategy, as part of the Local Development Framework, contains the relevant planning policy to protect and improve air quality in the borough. In this reporting period there were no new developments that had significant impacts on air quality.

5.11 Wigan

Business compliance and Improvement at Wigan Council review all planning applications, and where required condition the planning application so that a full assessment is undertaken and measure implemented to reduce or negate the impacts, including Air Quality.

Tesco retail and petrol station and cinema complex:
Barlo House,
Spinning Jenny Way,
Leigh.
Redevelopment of former radiator site to provide supermarket (Class A1), a seven sc reen cinema (Class D2), four restaurant units (Class A3), a petrol filling station and a ssociated kiosk, alterations to the access arrangements, associated servicing, car.

Morrisons Food Store and Petrol Station:
Leigh Sports Village,
Atherleigh Way,
Leigh.
Leigh Sports Village Phase III commercial and related works, comprising alterations

in the floor space composition and positioning of planning permission A/03/58535 to provide for a food store and ancillary petrol filling station, class A1 - A5 units

Bickershaw South,
Bickershaw Colliery Site,
Plank lane,
Leigh.
Mixed use development comprising 471 residential units (437 dwellings and 34 apart ments), 644 square metres of office space, a community centre and cafe, together with associated public open space and landscaping.

Parsonage Retail - Sainsburys Food store and petrol station
Sainsburys,
Parsonage Retail Park,
Parsonage Way,
Leigh.
Demolition of existing retail unit to create customer car park, new access point from Atherleigh Way and associated works.

6 Air Quality Planning Policies

Air quality is a material consideration when a development is planned. Each council will require an air quality assessment where it considers impacts from the development may affect air quality or be detrimental to the environment or people's health. Districts will provide guidance and advice using local and national polices to assist developers, consultants, on air quality issues regarding developments in their area. Appendix 3 contains the individual policies of the Greater Manchester Authorities.

Nationally policy is set by the National Planning Policy Framework which replaced the previous guidance on air quality and pollution set in PPS 23. The document states that the planning system should contribute and enhance the natural and local environment by preventing new and existing development from contributing to or being put at an unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution. It also states that planning decisions should take into account the presence of AQMAs, and that any new development is consistent with the air quality action plan.

The 10 Greater Manchester Authorities have formed a Combined Authority (CA) to improve governance on policies and strategies for the city region. Together with the Association of Greater Manchester Authorities (AGMA) the Combined Authority will develop a range of sub-regional planning documents including the Greater Manchester Strategy 2013-2020 Stronger Together. The CA also shares the same powers as the local authorities in respect of the air quality powers under Section 82 to 84 of the Environment Act 1995 to review, and access air quality and declares and undertakes duties in an air quality management area.

The Greater Manchester Strategy (GMS) sets our direction of travel and priority actions to 2020. Among its key priorities, are a low carbon economy and sustainable development to underpin future prosperity and economic development for the city region. Optimising the low carbon economy to reduce air quality emissions though

the LTP can yield additional benefits to the economy such as reducing health costs, while also making more effective use of limited funds.

The first Greater Manchester Air Quality strategy was set out in 2002 with the Greater Manchester Air Quality Management Strategy 'Clearing the Air'. This set the scene for developing the Greater Manchester Air Quality Action Plan, which was published in 2004. Following guidance to link air quality strategies with Local Transport Plans, where transport was the main contributor, key air quality objectives were transposed into the Local Transport Plan 2011-2016 (LTP3). The Air Quality Local Transport strategy sets out the steps to reduce emissions associated with local transportation in Greater Manchester. The air quality strategy is embedded in the LTP cycle, is reviewed in five yearly cycles and the current LTP plan is available on line at: http://www.tfgm.com/ltp3/Pages/Local-Transport-Plan.aspx

7 Local Transport Plans and Strategies

Greater Manchester published its third Local Transport Plan in April 2011, setting out the plans and spending priorities of Transport for Greater Manchester. The Greater Manchester Air quality Strategy is in the LTP aims to substantially reduce the negative impacts of transport on heath and the environment by modal shift away from vehicles and integrating with measures with the low carbon economy. The Plan includes a Long-Term Strategy outlining our transport vision for the next fifteen years; together with a series of detailed Local Area Implementation Plans which set out our collective spending plans for the next four years, up to 2025. This plans cover all modes of travel, including buses, heavy rail, Metrolink, walking, cycling, cars and freight, as well as the other issues which affect people's travel choices - fares, ticketing, passenger information, accessibility and safety

The current levels of poor air quality and concerns over general health have highlighted the need to increase the walking or cycling for shorter journeys. At the time of writing the plan, 15 per cent of people commuting by car travel less than 2km (just over 1 mile) and more than 30 per cent of car commuters travel less than 5km (around 3 miles). The aim is to encourage more people to make shorter journeys on foot or by bicycle to reduce local car traffic and emissions while also promoting an active lifestyle to promote healthier living.

8 Climate Change Strategies

8.1 Introduction

Although aimed primarily at carbon emissions one of the principle outcomes of this strategy will be a significant reduction in fossil fuel use, which in most cases will lead to a corresponding reduction in the release of nitrogen dioxide and particulates. It is envisaged that this strategy and the momentum that it builds in our communities will contribute immensely to the improvement of air quality in the Greater Manchester Area.

8.2 Objectives

This strategy sets out 4 main objectives and these are outlined as follows:-

- To make a rapid transition to a low carbon economy
- To reduce carbon emissions by 48% (from a 1990 baseline) by 2050
- To be prepared for and actively adapt to a rapidly changing climate
- To embed carbon literacy into the culture of organisations, lifestyles and behaviours.

A number of actions are described which will help Greater Manchester to pursue these objectives and are divided into specific themes.

8.3 Actions

The following action themes from the Greater Manchester Climate Change Strategy are likely to have a positive impact on air quality.

8.3.1 Transport

Transport accounts for 30% of our total emissions and future growth patterns suggest that this is likely to increase if no action is taken. This area of activity is likely to have the biggest impact on air quality and actions include:-

- Setting targets for reducing carbon emissions from transport
- Reducing congestion
- Manage freight including the introduction of consolidation centres

- Continue investment in bus rail and Metrolink services to encourage modal shift and manage the impact of transport emissions from new developments.
- Improving passenger information/communication re public transport along with pricing improvements to encourage large scale behavioural change.
- Introduce smart ticketing across Greater Manchester to encourage use of public transport
- Encourage flexible and home working policies to reduce the need to travel at peak times.
- Support community initiatives that encourage behavioural change e.g. cycle training, cycle loan agreements improved cycle infrastructure.
- Establish Greater Manchester as a centre for car clubs and car sharing
- Market and promote cycling.
- Partnership contracts with bus operators to improve performance, reliability, affordability and accessibility on the bus network.
- Work with all Greater Manchester councils to tackle emissions relating to commuting into Manchester centre.
- Develop new approaches to reduce emissions from freight- looking specifically at logistics, technology, driving styles and fuels.
- Support the uptake of low carbon vehicles and fuels.
- Utilise intelligent traffic management systems to relieve congestion and reduce emissions.

8.3.2 Buildings

Buildings account for 36% of carbon emissions and therefore this is a key area of activity. Actions include:-

- Retrofitting energy efficiency and micro generation technologies to existing buildings both domestic and commercial.
- Improving the low carbon performance of new build.
- Promoting Green Deal.
- Adapting to climate change.
- Improving carbon literacy.
- Promoting low carbon businesses.
- Supporting research and technological development.

8.3.3 Energy Distribution, Generation and Use.

Greater Manchester is powered by a mix of gas, electricity, transport fuels and a small amount of oil, solid fuel and biomass. Only a small percentage of our energy comes from renewable energy sources. This area of the strategy aims to address this by promoting renewables and reducing our dependency on fossil fuels. Actions include:-

- Create market conditions which promote low and zero carbon energy generation and distribution.
- Develop understanding of the need to decarbonise energy supplies.
- Support and invest in renewable and low carbon generation.
- Integrate development of new heating/generation networks with major retrofitting programmes.
- To be early adopters of smart grids and smart technologies.

8.3.4 Sustainable Consumption

Everything we consume has a carbon impact. The goods and services we purchase, the food we eat, the way we use buildings and the way we choose to travel all result in what we call embedded emissions in their production, use and disposal. This strategy recognises the importance of embedded emissions and the need for a “consumption based” approach to emissions reduction. Although aimed at carbon, the reduction of embedded carbon emissions is likely to lead to an associated reduction in other air pollutants such as nitrogen dioxide and particulates.

Actions include:-

- Developed understanding of embedded emissions.
- Continue and extend business pledge and ENWORKS programmes to identify, engage and nurture the next generation of low carbon business leaders.
- Improve waste and resource management.
- Develop innovative approaches to increase local manufacture, assembly and repair of low carbon products.
- Promote sustainable procurement with local business partners.
- Enable and promote a sustainable framework of local food production to connect local producers and consumers.

8.3.5 Enabling and Cross Cutting Actions

In addition the clearly identified areas of action above the GM strategy includes a number of actions that cut across these themes and these can be outlined as follows.

- Creating Green Jobs- to create a thriving low carbon economy.
- Working across spatial levels – ensuring collaboration of all appropriate agencies to deliver objectives.
- Developing a common measurement methodology – to ensure a robust common approach to carbon accounting.
- Co-ordinating business and organisation networks – to ensure businesses realise their full potential in contributing to and benefiting from the low carbon economy.
- Recognising inequality, health and wellbeing – to address the risk that people and places facing poverty are likely to be disproportionately affected by climate change.
- Embedding action on climate change within the spatial strategy - to ensure that local planning frameworks will help to deliver the Greater Manchester objectives.

8.4 Conclusions

The Greater Manchester Climate Change Strategy is an ambitious strategy to reduce carbon emissions and to embed carbon management into business, economic and training activities in our region. Although aimed at carbon the strategy will seek to set up robust systems to reduce fossil fuel use into the future and this will also have a positive impact on the reduction of emissions of nitrogen dioxide and particulates.

9 Implementation of Action Plans

The progress report on the Air Quality Action Plan will be submitted separately.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

The annual mean air quality objective for nitrogen dioxide is exceeded at some automatic sites and diffusion tube locations in Greater Manchester and the Air Quality Management Area (AQMA) should remain in place.

There are some sites in the AQMA that are below the threshold of it's declaration at 35 µg/m^3 and Greater Manchester has recently re-modelled the area to update the area of likely exceedences. A modelling report will be submitted to DEFRA on the proposed changes to the AQMA.

There are no exceedences of the hourly nitrogen dioxide standard.

Particulate matter (less than 10 microns) annual averages are not exceeded and have a downward trend. No sites had more than 35 occurrences of the daily mean and therefore the air quality objective was met.

10.2 Conclusions relating to New Local Developments

The assessment of new local developments has not identified any significant impacts on air quality. It is concluded that it will not be necessary to proceed to Detailed Assessment.

10.3 Proposed Actions

The Progress Report shows an improvement in local air quality and but area remain above the air quality objective. Greater Manchester has completed a modelling assessment and will submit a report on proposed changes to the air quality management area to DEFRA..

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http://www.gmtu.gov.uk/reports/emigma/HFASReport1679v1.0.pdf

2008 Update published March 2013
http://www.gmtu.gov.uk/reports/emigma/HFASReport1692v1.0.pdf
2010 Update published May 2014
http://www.gmtu.gov.uk/reports/emigma/HFASReport1750v1.0.pdf

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http://www.manchester.gov.uk/download/downloads/id/14851/greater_manchester_air_quality_action_plan_-_2004

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http://www.tfgm.com/ltp3/

Local Transport Plan (LTP)
http://www.tfgm.com/ltp3/Pages/Local-Transport-Plan.aspx

Local_ transport_Plan_Core_Strategy.pdf
http://www.tfgm.com/ltp3/documents/Greater_Manchester_Local_ Local transport_Plan_Core_Strategy.pdf

Local Transport Plan (Ltp3) Air Quality Strategy
http://www.tfgm.com/journey_planning/LTP3/Documents/Air-Quality-Strategy-and-Action-Plan.pdf

Manchester Strategy 2013-2020 Stronger Together
http://www.agma.gov.uk/gmca/gms_2013/index.html

Low Carbon Benefits to the Economy
http://europeanclimate.org/wp-content/uploads/2014/06/EY_ECF_Macro-economic-impacts-of-the-low-carbon-transition_Report_2014-06-05.pdf

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Appendices

Appendix 1: QA:QC Data

Appendix 2: Monitoring Data

Appendix 3: Local Authority Air Quality Planning Policies

Appendix 1: QA:QC Data

A1.1 Diffusion Tube Bias Adjustment Factors

The tubes are prepared and analysed by Staffordshire Scientific Services using the 20% triethanolamine (TEA) in water method. The laboratory method is UKAS accredited. Results from the quality control schemes published on the LAQM website give the laboratory a good precision rating.

NO2 diffusion tubes are affected by several factors, which may cause them to have bias (over-read), or negative bias (under-read) relative to the reference technique. To compare with the AQS objectives it's important that tubes are corrected (adjusted) by comparing with a chemiluminescent analyser reference method for NO2.

Bias 2012 and 2013 Diffusion Tube Data:

The national site database held by NPL is used to compare factors from national and locally calculated studies. For 2012 and 2013 the national bias factor was selected as it is based on a larger number of results, is compatible with results in 2011 and as shown below there is minimal difference between the two sets. For a local calculated factor the Manchester sites are selected, extracted and the average factor calculated as advised by the NPL[1].

NPL recommends that "*to obtain a new correction factor that includes your data, average the bias (B) values, expressed as a factor, i.e. -16% is -0.16. Next add 1 to this value, e.g. -0.16 + 1.00 = 0.84 in this example, then take the inverse to give the bias adjustment factor 1/0.84 = 1.19. (This will not be exactly the same as the correction factor calculated using orthogonal regression as used in this spreadsheet, but will be reasonably close).*"

Table A1.1 2013 Summary of 2012 and 2013 Bias Factors (applied in bold)

	2012	**2013**
National	**0.86**	**0.87**
GM only	.869	0.90
Version	Spreadsheet Version Number: 07/13	Spreadsheet Version Number: 03/14
File	Database_Diffusion_Tube_Bias_Factors-v07_13forGM-Final (L:\AQReports12\NO2\NO2Bias-NPL\NationalFactors)	Database_Diffusion_Tube_Bias_Factors-v03_14-Final-v2-GM L:\AQReports13\NO2\SalfordBias

[1] There are no filters on the NPL sheet to selected individual LAs to form a local factor.

Annualisation:

Data obtained from the diffusion tubes with less than 9 months data capture was annualised to a projected annual mean for 2012 and 2013 following a similar approach to that described in LAQM TG(09) (Defra, 2009). The period mean is calculated for matched periods using diffusion tubes for the years 2012 and 2013. A monthly mean for each exposure period using tubes with 100% data capture at urban centre suburban and background sites is calculated. A period mean, **Pm,** is calculated matching the tube exposure period and compared with the 12 month annual mean, **Am**. A factor **Am/Pm** is applied to the tube. A spreadsheet is used to derive and apply factors to the data. The period mean was calculated using the exposure dates from the national NO2 calendar but some tubes exposure period will be slightly different by up to a week. No adjustment was made for these tubes but within the 47 tubes used for 2013 analysis some would have had a similar spread in exposure periods. Tables A1.2 show calculation for a sample tube.

Table A1.2 Network Monthly Means and Annual Mean

	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Network Annual Mean (Am)**
Monthly Mean (100%)	41.7	35.6	25.9	21.2	20.3	21.1	27.97
	Jul	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	
	24.0	23.2	29.0	24.4	37.0	32.2	

Month	**S**	**O**	**N**	**D**	**Mean**
Network Annual Mean (Am)					27.97
Pm (Network Mean)	29.0	24.4	37.0	32.2	30.7
Measured Conc., **M**, Tube SA54	31.6	30.3	51.9	30.6	36.1
Factor **Am**/**Pm**					0.912
(**Am**/**Pm**) x **M**					32.93
Bias Factor (0.87)					28.65

LAQM TG(09) also recommends deriving a factor based on automatic sites within a 50 mile radius. The same adapted method was used to calculate the monthly mean using background AURN sites, (ECCL, Wigan, Manchester Piccadilly, Manchester South, Glazebury, Tranmere, and Warrington). Figure A1.1 compares the outcome using factors calculated by the automatic and diffusion network methods There are

variations within the group but overall the averages are within 1.56 %[2] of each other. The average for tubes adjusted with automatic site data was 32.2 µg/m3 compared with 31.7 µg/m3 for the tube data. The difference between the two methods is very small and so the tube based correction was used.

Table A1.3 2013 Bias Adjustment - National & Local Factors

Spreadsheet Version Number: 03/14

Original Sh \\salford.gov.uk\envs\AQData\AQReports13\NO2\SalfordBias\Database_Diffusion_Tube_Bias_Factors-v03_14-Final-v2-GM.xls

National Adjustment Factor.

Staffordshire 20% TEA in Water for all LA in scheme

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)	GM	Bias (Fraction
Staffordshire	20% TEA in water	2013	UC	Manchester	11	42	39	6.7%	G	0.94	Y	0.06
Staffordshire	20% TEA in water	2013	SU	Manchester	11	27	22	20.6%	G	0.83	Y	0.20
Staffordshire	20% TEA in water	2013	KS	Manchester	10	68	54	25.9%	G	0.79	Y	0.25
Staffordshire	20% TEA in water	2013	R	Cannock Cha	12	48	36	32.2%	G	0.76		0.32
Staffordshire	20% TEA in water	2013	UC	Stoke-on-Tre	11	31	29	6.5%	G	0.94		0.06
Staffordshire	20% TEA in water	2013	R	Stoke-on-Tre	11	57	49	15.8%	G	0.86		0.15
Staffordshire	20% TEA in water	2013	R	Stoke-on-Tre	11	39	32	19.7%	G	0.84		0.19
Staffordshire	20% TEA in water	2013	R	Stockport	9	32	28	12.8%	G	0.89	Y	0.12
Staffordshire	20% TEA in water	2013	UI	Salford City	12	33	30	9.3%	G	0.91	Y	0.09
Staffordshire	20% TEA in water	2013	R	Salford City	10	58	62	-5.9%	G	1.06	Y	-0.05
Staffordshire	20% TEA in Water	2013	KS	Marylebone	11	97	80	20.5%	G	0.83		0.20
Staffordshire	20% TEA in water	2013	Overall Factor[3] (11 studies)					Use		0.87		

Greater Manchester Districts

Staffordshire 20% TEA in Water for GM districts in scheme

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)	GM	Bias (Fraction)
Staffordshire	20% TEA in water	2013	UC	Manchester	11	42	39	6.7%	G	0.94	Y	0.067
Staffordshire	20% TEA in water	2013	SU	Manchester	11	27	22	20.6%	G	0.83	Y	0.206
Staffordshire	20% TEA in water	2013	KS	Manchester	10	68	54	25.9%	G	0.79	Y	0.259
Staffordshire	20% TEA in water	2013	R	Stockport	9	32	28	12.8%	G	0.89	Y	0.128
Staffordshire	20% TEA in water	2013	UI	Salford City	12	33	30	9.3%	G	0.91	Y	0.093
Staffordshire	20% TEA in water	2013	R	Salford City	10	58	62	-5.9%	G	1.06	Y	-0.059

Range	min	0.79	Avg Bias	0.116
Range	max	1.06	Add 1	1.116
Overall GM Factor[3] (6 studies)			Use	0.90

[2] % difference |(x-y)|/ (x+)y/2

Table A1.4 2012 Bias Adjustment - National & Local Factors

2012 Diffusion Tube Bias Adjustment Factor Spreadsheet

This sheet compares the bias factor calculated using only GM sites and the Nationally derived bias factor.
Where new co-located data is added or a local factor for GM; the bias factor is recalculated using the method outlined below 1

link to sept sheet
LinktoJuly
GM Version 1
2012 Bias factor = 0.86

Summary	Bias	Comment
National Bias Adjustment All SSS Studies	0.860	All SSS Studies (13)
Bias Adjustment Manchester Sites and Additional GM	0.869	Manchester Studies (6)

National Bias Adjustment All SSS Studies

National Bias Adjustment All SSS											Bias
Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)	Area GM or N= Neighbou
2012 No additional sites added GM Sites = 0.869 All sites =0.86		2012	R	Cannock Chase Cou	12	49	39	28.0%	G	0.78	
		2012	R	East Staffordshire B	9	49	31	55.1%	G	0.64	
Staffordshire Scie	20% TEA in	2012	UB	Stoke-on-Trent City	12	34	32	6.8%	G	0.94	
Staffordshire Scie	20% TEA in	2012	R	Stoke-on-Trent City	11	58	55	5.2%	G	0.95	
Staffordshire Scie	20% TEA in	2012	R	Stoke-on-Trent City	12	43	34	25.9%	G	0.79	
Staffordshire Scie	20% TEA in	2012	KS	Marylebone Road Int	12	106	95	11.9%	G	0.89	
Staffordshire Scie	20% TEA in	2012	UC	Manchester City Cou	10	46	41	12.5%	G	0.89	GM
Staffordshire Scie	20% TEA in	2012	SU	Manchester City Cou	12	30	24	22.7%	G	0.81	GM
Staffordshire Scie	20% TEA in	2012	KS	Manchester City Cou	12	77	62	23.4%	G	0.81	GM
Staffordshire Scie	20% TEA in	2012	O	South Staffordshire	12	38	39	-2.7%	G	1.03	
Staffordshire Scie	20% TEA in	2012	R	Stockport MBC	11	34	29	15.8%	G	0.86	GM
Staffordshire Scie	20% TEA in	2012	UB	WIGAN	12	29	24	19.2%	G	0.84	GM
Staffordshire Scie	20% TEA in	2012	R	Salford City Council	12	59	61	-3.2%	G	1.03	GM
Staffordshire Scie	20% TEA in	2012	Overall Factor[3] (13 studies)					Use		0.860	

Bias Adjustment 2012 Local Factor

Bias Adjustment Manchester Sites and Additional GM Studies (if available)

National Bias Adjustment All SSS											Bias
Analysed By	Method	Year	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision	Bias Adjustment Factor (A) (Cm/Dm)	Area GM or N= Neighbour
Staffordshire Scie	20% TEA in	2012	UC	Manchester City Cou	10	46	41	12.5%	G	0.89	GM
Staffordshire Scie	20% TEA in	2012	SU	Manchester City Cou	12	30	24	22.7%	G	0.81	GM
Staffordshire Scie	20% TEA in	2012	KS	Manchester City Cou	12	77	62	23.4%	G	0.81	GM
Staffordshire Scie	20% TEA in	2012	R	Stockport MBC	11	34	29	15.8%	G	0.86	GM
Staffordshire Scie	20% TEA in	2012	UB	WIGAN	12	29	24	19.2%	G	0.84	GM
Staffordshire Scie	20% TEA in	2012	R	Salford City Council	12	59	61	-3.2%	G	1.03	GM
Staffordshire Scie	20% TEA in	2012	Overall Factor[3] (6 studies)					Use			
							Avg Bias	0.151			
							Add 1	1.151			
Notes				Overall Factor[3] (6 studies)			Bias	0.869			

Bias Adjustment Factors 2007-2011

Prior to 2011 each district applied its own bias factor from co-located tubes at their automatic or nearby monitoring sites using the AEA spreadsheet to check the bias and precision and derive the bias factor. The factors are summarised below:

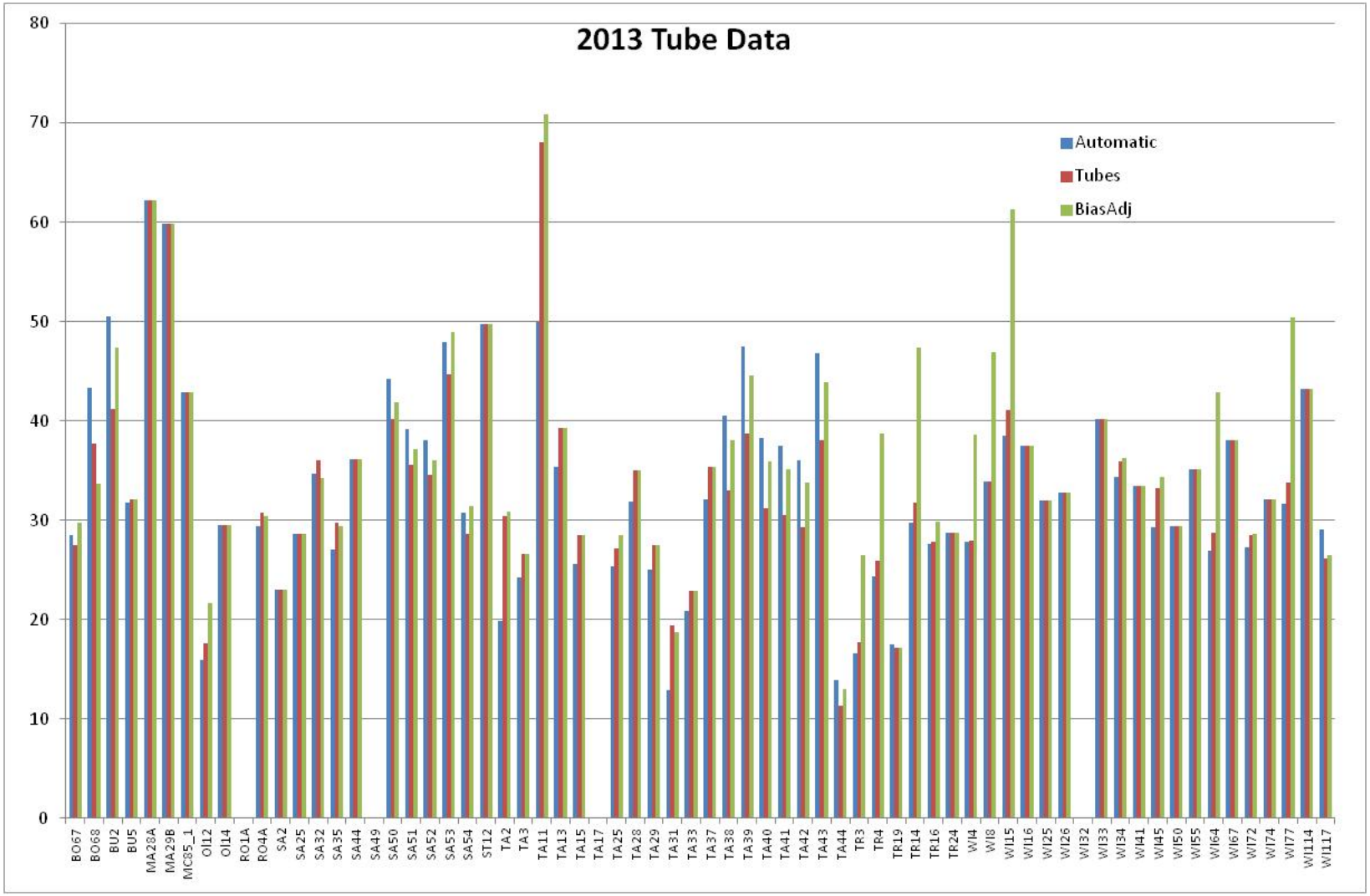
Table A1.5 Bias Adjustment Factors 2007-2011

Local Authority	2007	2008	2009*	2010	2011	Comments
Bury		0.87	0.93	0.99	0.883	
Botlon		0.83(a)	0.81/0.82(b)	0.85(c)	0.883	*(a)UWE Spreadsheet version 09/09.(b) Eurofins 0.82 to July 2009; Staffordshire Scientific Services 0.81 from August 2009.(c)UWE Spreadsheet version 06/11.*
Manchester	0.9	0.83	0.79/0.75 (a)	0.93/0.89 (a)	0.88	*(a)* 2009 = 0.79 kerbside, roadside, urban centre and urban background locations; 0.75 suburban and rural sites. 2010 = 0.93 kerbside, roadside, urban centre and urban background locations; 0.89 suburban and rural sites
Oldham	0.9	0.83	(a)	0.85	0.883	*(a)results for 2009 are included for completeness, but have not been bias adjusted due to a change in diffusion tube supplier part way through the year and also there was low data capture. It is best not to use these results to make any assumptions regarding compliance with the objectives or trends in pollution concentrations.*
Rochdale					0.883	
Salford	0.89	0.95	0.97	0.98	0.883	*2010 Two analyst Bureau Veritas(BV) (Jan-July) and Staffordshire Scientific Services (SSS), (Aug-Dec) used for survey . Bias factors calc for each analyst, for colocated*
Stockport	0.9	0.7	0.745	0.85	0.883	
Tameside	0.776	0.806	0.768	0.782	0.883	
Trafford	0.9	0.83	0.9/.81	0.85	0.883	
Wigan	0.9	0.94	0.76	0.886	0.883	
GM Average factor	0.881	0.845	0.835	0.884	0.883	

Note

*NO2 diffusion tubes used by the GM districts up to July 2009 were provided by Bureau Veritas, exposed monthly and are based on 10% TEA (triethanolamine) in water; from August onwards Staffordshire Scientific provided the service using a 20% TEA in water method.

Figure A1.1 Comparison of Annual Factors



A1.2 Automatic Site Adjustments

Nitrogen Dioxide

Automatic monitoring sites with less than 75% data capture in 2012/3 have been adjusted to an annual mean, as set out in Box 3.2 of LAQM.TG(09). The period mean (Pm) for each site is adjusted using the ratio (Am/Pm) of the annual means (Am) to the period mean(Pm) using the background sites shown below. The results are set out in the spreadsheet attached to this report. The sites used the calculation were screened for any large data gaps or unusually results, see figure A1.2 and FigA1.3. Sites with low data capture were excluded from in the analysis, e.g Sheffield Centre, Mold, Man Piccadilly and Glazebury not used in 2012 after reviewing the yearly site plots.

PM10

Tameside Mottram Moor with a data capture of 23.3% in 2013 was annualised using Teom data at four back ground sites as set out in LAQM Technical Guidance TG(09). Results are shown in Table A1.7.

Table A1.6 AURN Sites used NO2 and PM10* Annual Adjustment of 2012 and 2013 Data

AURN Code	Name	Type
BAR3	Barnsley Gawber	Urban Background
BLC2	Blackpool Marton	Urban Background
CHS6	Chesterfield	Urban Background
GLAZ	Glazebury	Rural Background
LB	Ladybower	Rural Background
LEED	Leeds Centre	Urban Background
MAN3 /MAN7*	Manchester Piccadilly	Urban Background
PRES	Preston	Urban Background
SHE2	Sheffield Centre	Urban Background
SHE	Sheffield Tinsley	Urban Background
STOK	Stoke-on-Trent Centre	Urban Background
WIG5/ WIG7*	Wigan Centre	Urban Background
TRAF	Trafford Moos Lane	Urban Background
TAME*	Tameside two Trees	Urban Background
TAM1*	Tameside Mottram Moor	Urban Background

Table A1.7 NO2 and PM10 Annual Adjustment Factors 2012 and 2013 Data

code	variable	mean.Annual	dc.Annual	mean.Period	N.Period	dc.Period	Am_Pm
BAR3	no2	20.92	94.05	20.10	4718	91.93	1.04
BLC2	no2	20.23	95.37	19.97	4857	94.64	1.01
CHS6	no2	18.22	97.30	18.27	4922	95.91	1.00
LB	no2	10.48	97.70	11.05	4939	96.24	0.95
LEED	no2	35.94	98.79	34.94	5052	98.44	1.03
PRES	no2	30.30	96.80	29.38	4898	95.40	1.03
SHE	no2	35.21	98.92	34.32	5065	98.69	1.03
STOK	no2	31.32	98.75	30.83	5063	98.66	1.02
WIG5	no2	23.93	99.46	21.37	5099	99.36	1.12
BURY	**#N/A**	**#N/A**	**#N/A**	**56.00**	**5132**	**100**	**#N/A**

BURY	
Factors mean	1.02
Ste Period mean	56.00
Ste Adjusted mean	57.37

GMAQN: Site code AURN or AirQualityEngland (AQE)

GMAQN: Period Mean of background sites

GMAQN: No of observations in period

GMAQN: Data capture for the period

code	variable	mean.Annual	dc.Annual	mean.Period	N.Period	dc.Period	Am_Pm
BAR3	no2	20.92	94.05	19.91	4822	90.62	1.05
BLC2	no2	20.23	95.37	19.81	5027	94.47	1.02
CHS6	no2	18.22	97.30	17.78	5110	96.03	1.02
LB	no2	10.48	97.70	10.99	5130	96.41	0.95
LEED	no2	35.94	98.79	34.52	5270	99.04	1.04
PRES	no2	30.30	96.80	28.98	5083	95.53	1.05
SHE	no2	35.21	98.92	33.96	5255	98.76	1.04
STOK	no2	31.32	98.75	30.85	5219	98.08	1.02
WIG5	no2	23.93	99.46	21.01	5284	99.30	1.14
WIG6	**#N/A**	**#N/A**	**#N/A**	**25.05**	**5321**	**100**	**#N/A**

WIG6	
Factors mean	1.0364
Ste Period mean	25.05
Ste Adjusted mean	25.96

code	variable	mean.Annual	dc.Annual	mean.Period	N.Period	dc.Period	Am_Pm
BAR3	no2	21.50	98.81	21.71	5004	99.09	0.99
BLC2	no2	16.27	99.26	14.56	5011	99.23	1.12
CHS6	no2	18.15	94.18	16.87	4808	95.21	1.08
GLAZ	no2	14.22	98.79	12.10	4977	98.55	1.18
LB	no2	14.16	99.22	13.50	5009	99.19	1.05
LEED	no2	34.32	97.03	32.75	4844	95.92	1.05
MAN3	no2	38.80	93.77	36.33	4593	90.95	1.07
PRES	no2	25.36	92.93	22.76	4612	91.33	1.11
STOK	no2	29.05	92.20	29.98	4518	89.47	0.97
WIG5	no2	24.57	98.14	22.37	4916	97.35	1.10
TAME	**#N/A**	**#N/A**	**#N/A**	**18.05**	**5050**	**100**	**#N/A**

TAME	
Factors mean	1.07
Ste Period mean	18.05089109
Ste Adjusted mean	19.32655929

code	variable	mean.Annual	dc.Annual	mean.Period	N.Period	dc.Period	Am_Pm
BAR3	no2	21.50	98.81	26.28	2094	99.62	0.82
BLC2	no2	16.27	99.26	18.09	2102	100.00	0.90
CHS6	no2	18.15	94.18	19.90	2102	100.00	0.91
GLAZ	no2	14.22	98.79	15.59	2076	98.76	0.91
LB	no2	14.16	99.22	15.21	2099	99.86	0.93
LEED	no2	34.32	97.03	40.36	2102	100.00	0.85
MAN3	no2	38.80	93.77	43.87	1990	94.67	0.88
PRES	no2	25.36	92.93	26.59	2032	96.67	0.95
STOK	no2	29.05	92.20	36.41	2065	98.24	0.80
WIG5	no2	24.57	98.14	29.93	1983	94.34	0.82
TAM1	**#N/A**	**#N/A**	**#N/A**	**37.21**	**2102**	**100**	**#N/A**

TAM1	
Factors mean	0.88
Ste Period mean	37.21
Ste Adjusted mean	32.67

code	variable	mean.Annual	dc.Annual	mean.Period	N.Period	dc.Period	Am_Pm
BAR3	no2	21.50	98.81	25.07	3896	98.56	0.86
BLC2	no2	16.27	99.26	20.24	3927	99.34	0.80
CHS6	no2	18.15	94.18	22.60	3701	93.63	0.80
GLAZ	no2	14.22	98.79	18.61	3906	98.81	0.76
LB	no2	14.16	99.22	16.27	3923	99.24	0.87
LEED	no2	34.32	97.03	39.08	3900	98.66	0.88
MAN3	no2	38.80	93.77	44.91	3905	98.79	0.86
PRES	no2	25.36	92.93	30.62	3795	96.00	0.83
STOK	no2	29.05	92.20	32.31	3812	96.43	0.90
WIG5	no2	24.57	98.14	31.30	3879	98.13	0.78
TRF2	**#N/A**	**#N/A**	**#N/A**	**47.20**	**3953**	**100**	**#N/A**

TRF2	
Factors mean	0.84
Ste Period mean	47.20

Tameside Mottram Moor (TAM1) VCM Annualisation

code	variable	mean.Annual	dc.Annual	mean.Period	N.Period	dc.Period	Am_Pm
MAN7	PM10	22.35	86.74	20.43		81.85	1.09
TRAF	PM10	14.97	98.45	15.33		98.04	0.98
TAME	PM10	17.83	89.17	18.49		85.95	0.96
WIG7	PM10	18.91	96.47	17.14		97.61	1.10
TAM1	PM10	#N/A	#N/A	18.00		100	1.03

Factors mean	1.03
Ste Period mean	22.52
Ste Adjusted mean	23.29

\\salford.gov.uk\envs\AQData\GMAQN\Automatic\2013\WIP\Anal\output\fac-site.xlsx

Figure A1.2 2013 Annual plots of Background Sites AURN used for Annual Factor (BGS13)

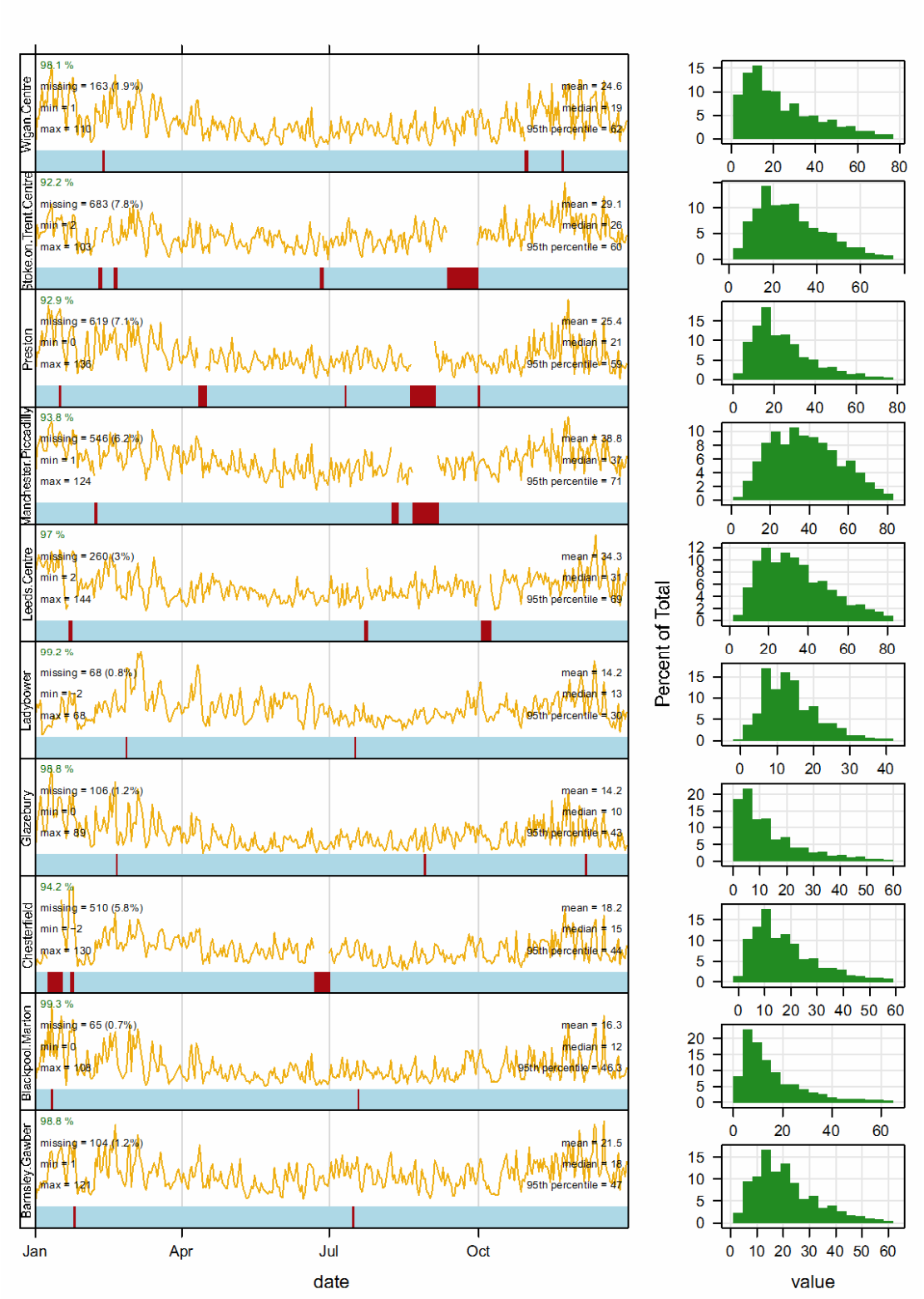
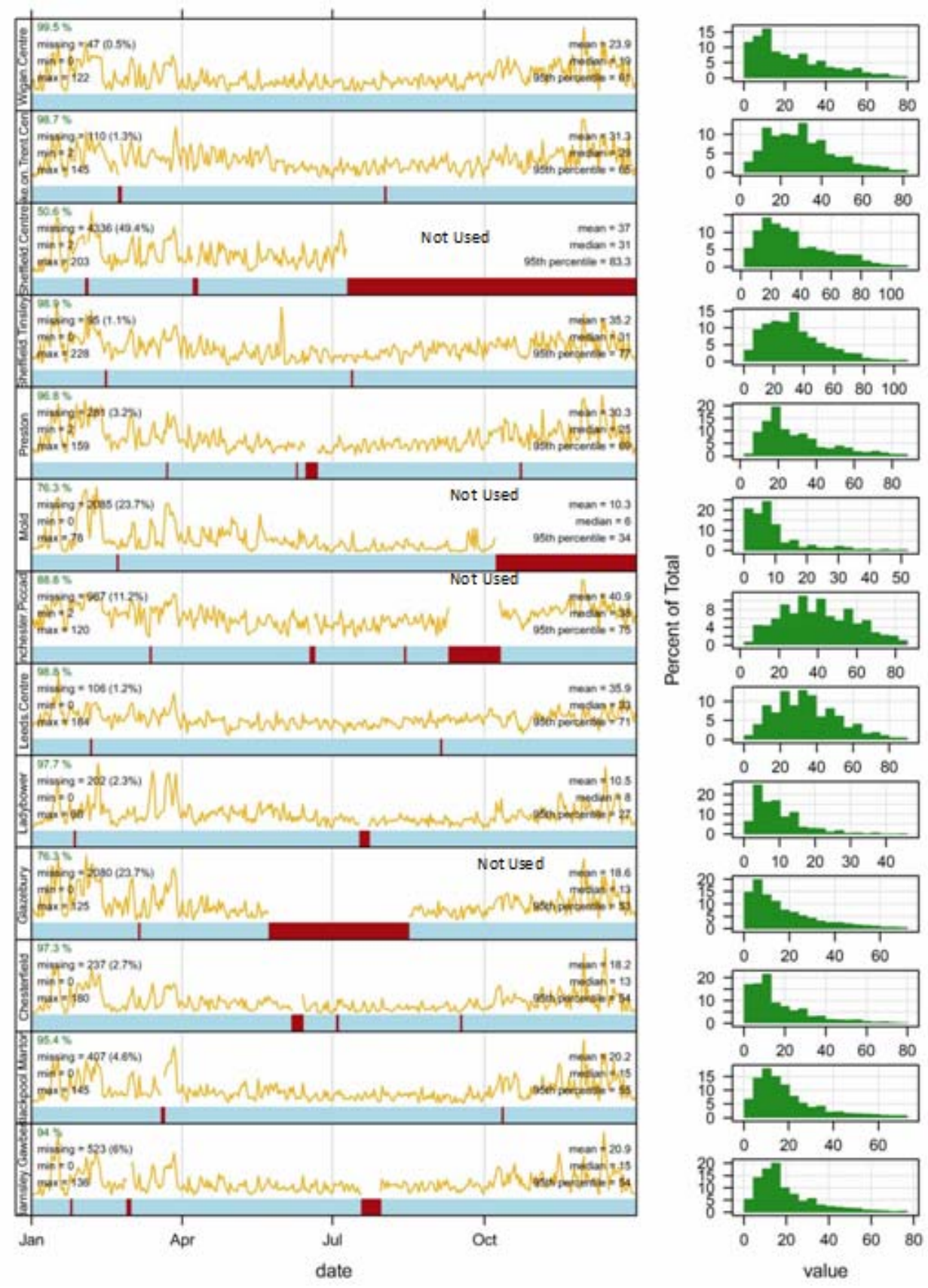


Figure A1.2b 2012 Annual plots of AURN Background Sites used for Annual Factor (BGS12)



A1.3 QA/QC of automatic monitoring

Automatic air quality analysers in Greater Manchester area are subject to a high level of quality assurance/ quality control. Most analysers are either operated as part of the national Automatic Urban and Rural Network (AURN) or are part of the 'Calibration Club' scheme run by Ricardo-AEA or similar schemes to provide accurate and robust data.

The procedures are equivalent to the UK Automatic Urban and Rural Network (AURN) the main features of the services being:-

Calibration Club

- Data screened daily for errors and final data ratified and published to same standard as AURN sites.
- Data checked twice daily for errors and faults reported to Local Site operators
- Independent audits twice or once a year at Salford M60
- Final data set scaled and ratified to same standard as AURN.

Casella Data Management

The Casella service is similar to the calibration club with the exception of the independent audits. On site checks do include linearity test of analysers and gas phase titration (GPT) to check converter efficiency on the NOx instruments. Data is scaled to same standard as TG(09). TEOM data is corrected using the Volatile Correction Method.

Greater Manchester Air Quality Network (GMAQN)

Ricardo- AEA manages QA/QC and audit of the air quality stations to the same standard as the AURN. The network officially started on 1 September 2013. Table A1.7 list the Greater Manchester sites and their respective affiliation to the national network or the GAMQN.

A1.4 PM Monitoring & Adjustment

Particulate Monitoring

A number of different instruments are used in Greater Manchester for the measurement of particles. Historically TEOM have been used, but DEFRA recently

replaced and number of instruments with TEOM FDMS and some sites use the BAM or Partisol.

The reference method for the UK PM10 Objectives (and EU limit values) is based upon measurements from a gravimetric sampler. This samples over a 24 hour period and the particulate proportion less than 10 microns (PM10) is measured by the mass difference before and after exposure. It is labour intensive and the UK, and European Counties have invested heavily in the TEOM (Tapered Element Oscillating Microbalance (TEOM). The TEOM reading have been historically adjusted by a factor of 1.3 to make them gravimetric equivalent. However to further improve the technique; the measurement was modified by lowering the sampling temperature from 50 C to 30 C and adding a dryer to remove water vapour. This system is referred to a Filter Dynamics Measurement System (FDMS) and is equivalent to EU reference method.

Due to widespread use of the TEOM, and its reliability and the need to report to the EU using an 'equivalent method', The Volatile Correction Model (VCM) was developed by Kings College London, to adjust the TEOM data. Studies have shown that FDMS sites within 200 kilometres can be used to correct the Teom data as it assumes that the sample lost by the heating is the same over this geographical area. Sufficient FDMS sites have only been available since 1998/9 for the correction to be applied.

The BAM Met one (Beta Attenuation Method). THE BAM (Met One) meets the EU equivalence after correction of factor.

Particulate data collected is corrected as follows

- All Teom data reported as gravimetric, corrected by 1.3
- FDMS results - no correction required
- BAM data (Manchester Piccadilly and South) 0.8333
- VCM corrected data- available in spreadsheet.
- Partisol data at Manchester South, provided by Manchester City Council, requires no correction.

Table A1.8 Greater Manchester Sites

Site Name	OS Grid Ref		Pollutants measured						Site type
	E	N	NO_X	PM_{10}	$PM_{2.5}$	CO	SO_2	O3	
Bury (July14)			Yes	Yes	Yes				Roadside
Bury A56 Prestwich	381650	403222	Yes	Yes					Roadside
Bury A665 Radcliffe	378190	407480	Yes	Yes					Roadside
Glazebury	368758	396028	Yes					Yes	Suburban
Manchester Piccadilly	384310	398337	Yes	Yes	Yes		Yes	Yes	Urban centre
Manchester South	383904	385818	Yes	Yes	Yes		Yes	Yes	Suburban
Manchester Oxford Road	384233	397287	Yes	Yes (BAM)					Kerbside
Oldham, Shaw Crompton Way	393884	409183	Yes	Yes(BAM-H)					
Salford Eccles	377926	398728	Yes	Yes	Yes			Yes	Urban centre
Salford M60**	374810	400855	Yes	Yes					Roadside
Stockport Hazel Grove	391481	387637	Yes	Yes					Roadside
Tameside Two Trees Cal Club	393454	394330	Yes	Yes					Urban background
Tameside Mottram bypass	399781	395816	Yes	Yes					Roadside
Trafford Cal Club	378783	394726	Yes	Yes					Urban background
Trafford A56	379413	394014	Yes	Yes					Roadside
Wigan Centre	357815	406021	Yes	Yes	Yes			Yes	Urban Background

GMAQN	Part Affiliated AURN	Fully Affiliated AURN
GMAQN manager servicing on GMAQN sites and partly affiliated sites, along with audits / data management on GMAQN sites.		

Appendix 2: Monitoring Data

Table A2.1 Monitoring Data Tables

Table	Defra Table No	Title	File
Table A2.1	Table 2.2	Details of Non Automatic Monitoring Sites	GMTubeSites.xlsb tab T2.2
Table A2.2	Table 2.5	Table A2.2 Results of Nitrogen Dioxide Diffusion Tubes in 2013 (Table 2.5)	GMtubes2013v1-defra.xlsm
Table A2.3	Table 2.6	Table A2.3 2007- 2011 Diffusion Tube Results. (Table 2.6.)	

Annual Factors

Spread sheet provides the annual factors to adjust automatic site with low data capture (less that 75%)

Abbreviations
UB: Urban Background
Rs: Roadside
Ks: Kerbside
UC: Urban Centre
Su: Suburban
Ru: Rural

Table A2.2 Site Mapping

Site Type (LAQM TG.03)	Mapped to	
U1	UB	Urban Background
U2	UB	Urban Background
U3	UB	Urban Background
U4	UB	Urban Background
SU	UB	Urban Background
R1	Rs	Roadside

Table A2.3 Site Classifications

Kerbside	Sites with sample inlets within 1m of the edge of a busy road. Sampling heights are within 2-3m.
Roadside	Sites with sample inlets between 1m of the kerbside of a busy road and the back of the pavement. Typically this will be within 5m of the kerbside. Sampling heights are within 2-3m.
Urban Centre	Non-kerbside sites located in an area representative of typical population exposure in town or city centre areas e.g. pedestrian precincts and shopping areas. Sampling heights are typically within 2-3m.
Urban Background	Urban locations distanced from sources and broadly representative of city-wide background concentrations e.g. elevated locations, parks and urban residential areas
Urban Industrial	Sites where industrial emissions make a significant contribution to measured pollution levels.
Suburban	Sites typical of residential areas on the outskirts of a town or city.
Rural	Open country locations distanced from population centres, roads and industrial areas.
Remote	Open country locations within isolated rural areas, experiencing regional background pollution levels for much of the time.

Source: http://aurn.defra.gov.uk/air-quality-info/site-classes.htm

Appendix 3: Local Authority Air Quality Planning Policies

BOLTON

Policy CE7 Pollution states that:

> Development which is likely to give rise to air, water, land or noise pollution, will be assessed against national guidelines and other material considerations and if unacceptable will not be permitted.

2.5 Policy H3/3 Non-residential Uses in Residential Areas states:

In predominantly residential areas, non-residential uses will normally only be allowed where they do not adversely affect the amenities enjoyed by the residents. Uses that generate excessive noise, smell, fumes, and traffic or on-street parking problems will not normally be allowed in such areas. Where non-residential uses are allowed in residential areas, planning permissions will be subject to appropriate conditions to minimise the effect on residential amenity; e.g. limitations on noise levels, car parking and hours of operation.

BURY

Local Authority Name	
Does you Authority have a 'Development and Air Quality Supplementary Planning Document' or similar?	NO
Is the likely impact on air quality split in to 'bands' depending upon the severity of the impact? How many 'bands'?	N/A
What criterion is used to trigger these 'bands'?	
Band 1	N/A
Band 2	N/A
Band 3	N/A
Band 4	N/A
At which 'band' is an air quality assessment required for a proposed new development?	N/A
Where the air quality impact of a proposed new development is assessed as being 'significant' or worse is a financial contribution sought from the developer? If so, how is this calculated?	N/A
Does the policy deal with the mitigation of adverse air quality impacts during the construction phase?	N/A

MANCHESTER

Manchester Core Strategy 2012 to 2027
Policy EN 16
Air Quality

The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas.

Core Strategy Policy EN16 will seek to reduce emissions where possible and mitigate the impact of emissions on local air quality. Whilst this policy seeks to improve air quality within Manchester's AQMA it also applies across the District in order to assist air quality across Manchester remaining at acceptable levels. It should be noted that other policies within the Core Strategy will guide the location of development in order to reduce the need for private transport and encourage the use of decentralised and renewable energy and green infrastructure to reduce both emissions and their impact still further.

OLDHAM

Oldham Local Development Framework
Development Plan Document – Joint Core Strategy and Development Management Policies (November 2011)

Policy 9 – Local Environment

Local Environmental Quality and Amenity
a. The council will protect and improve local environmental quality and amenity by ensuring development:

i. is not located in areas where it would be adversely affected by neighbouring land uses; and
ii. does not have an unacceptable impact on the environment or human health caused by air quality, odour, noise, vibration or light pollution; and
iii. does not cause significant harm to the amenity of the occupants and future occupants of the development or to existing and future neighbouring occupants or users through impacts on privacy, safety and security, noise, pollution, the visual appearance of an area, access to daylight or other nuisances; and
iv. does not have a significant, adverse impact on the visual amenity of the surrounding area, including local landscape and townscape; and
v. does not result in unacceptable level of pollutants or exposure of people in the locality or wider area. Developments identified in the Air Quality Action Plan will require an air quality assessment; and
vi. is not located in areas where an identified source of potential hazard exists and development is likely to introduce a source of potential hazard or increase the existing level of potential hazard; and

vii. minimises traffic levels and does not harm the safety of road users. Proposals to work from home must also ensure provision is made for access, servicing and parking

Supporting text in relation to air quality

6.4 An air quality assessment will be expected where a potential `significant` impact on local air quality is anticipated, or where air quality remains generally unchanged but there is an increased risk of exposure. The following types of development would normally require an air quality assessment:
a. proposals that will result in increased congestion, a change in either traffic volumes (for example, 5% annual average daily traffic or peak) or a change in vehicle speed (±10 kilometres per hour), or both, on a road with greater than 10,000 vehicles per day.
b. proposals that will significantly increase the flow on roads lying within an Air Quality Management Area (AQMA).
c. proposals that would significantly alter the traffic composition in an area (e.g. bus stations, HGV parks, increased delivery traffic.)
d. proposals that include new car parking spaces (more than 80 spaces) or coach/lorry parks.
e. developments located in, or which may affect, sensitive areas (e.g. ecological sites), areas of poor air quality (including AQMAs) or which may generate pollution at levels that could harm health where either direct emissions to air occur, or where any of the preceding criteria are met.
f. residential, school, public buildings or similar developments lying within an area of poorer air quality such as an AQMA.

6.5 The following thresholds (developments of size equal or greater than criteria listed below) will also be used to determine where an air quality assessment is required:

Air quality thresholds

Development	**Site Area**	**Gross Floorspace**
Food retail	0.2 hectares	1,000 square metres
Non-food retail	0.8 hectares	1,000 square metres
B1(Business)	2.0 hectares	2,500 square metres
B2 (General Industry) and B8 (Storage or Distribution)	1.0 hectares	6,000 square metres
Other	60 or more vehicle movements in any hour	

6.6 The significance of the development in terms of its air quality impact will depend upon:
a. the extent of the predicted increase in pollution from the development;
b. whether the development is already in an Air Quality Management Area;
c. whether the development may cause exceedances of air quality objectives or standards where these did not already occur; d. whether the development affects the implementation of measures under the Air Quality Action Plan or Local Transport Plan;
e. exposure of people in the locality or wider area; and
f. whether the development could potentially affect a European designated nature conservation site.

6.7 It is not possible to place exact thresholds on what increases in pollution will make a proposed development unacceptable. Each proposal will be considered on the merits of its individual circumstances.

ROCHDALE

Local Authority Name	Rochdale MBC
Does you Authority have a 'Development and Air Quality Supplementary Planning Document' or similar?	NO – we have pollution policies in both our Unitary Development Plan (current planning policy document) and Core Strategy (future planning policy document)
Is the likely impact on air quality split in to 'bands' depending upon the severity of the impact? How many 'bands'?	No
What criterion is used to trigger these 'bands'?	
Band 1	
Band 2	
Band 3	
Band 4	
At which 'band' is an air quality assessment required for a proposed new development?	
Where the air quality impact of a proposed new development is assessed as being 'significant' or worse is a financial contribution sought from the developer? If so, how is this calculated?	Developers may sometimes be required to fund mitigation measures. Details in respect of how this will be calculated have not been finalised.
Does the policy deal with the mitigation of adverse air quality impacts during the construction phase?	Yes

SALFORD

Local Authority Name	Salford
Does you Authority have a 'Development and Air Quality Supplementary Planning Document' or similar?	NO
Is the likely impact on air quality split in to 'bands' depending upon the severity of the impact? How many 'bands'?	No. An air quality assessment required if it meets one of our criteria set in the validation check list available on our web site.
What criterion is used to trigger these 'bands'?	
Band 1	
Band 2	
Band 3	
Band 4	
At which 'band' is an air quality assessment required for a proposed new	N/A

development?	
Where the air quality impact of a proposed new development is assessed as being 'significant' or worse is a financial contribution sought from the developer? If so, how is this calculated?	Mitigation measures will be sought for the development or a section 106 agreement considered.
Does the policy deal with the mitigation of adverse air quality impacts during the construction phase?	Assessments will include an operational assessment and measures to reduce site emissions.

STOCKPORT

Local Authority Name	
Does you Authority have a 'Development and Air Quality Supplementary Planning Document' or similar?	NO
Is the likely impact on air quality split in to 'bands' depending upon the severity of the impact? How many 'bands'?	No
What criterion is used to trigger these 'bands'?	
Band 1	
Band 2	
Band 3	
Band 4	
At which 'band' is an air quality assessment required for a proposed new development?	
Where the air quality impact of a proposed new development is assessed as being 'significant' or worse is a financial contribution sought from the developer? If so, how is this calculated?	
Does the policy deal with the mitigation of adverse air quality impacts during the construction phase?	

TAMESIDE

Local Authority Name	
Does you Authority have a 'Development and Air Quality Supplementary Planning	NO

Document' or similar?	
Is the likely impact on air quality split in to 'bands' depending upon the severity of the impact? How many 'bands'?	No
What criterion is used to trigger these 'bands'?	
Band 1	
Band 2	
Band 3	
Band 4	
At which 'band' is an air quality assessment required for a proposed new development?	
Where the air quality impact of a proposed new development is assessed as being 'significant' or worse is a financial contribution sought from the developer? If so, how is this calculated?	
Does the policy deal with the mitigation of adverse air quality impacts during the construction phase?	

TRAFFORD

The Trafford Core Strategy, as part of the Local Development Framework, contains the relevant planning policy to protect and improve air quality in the borough.

WIGAN

Local Authority Name	Wigan Council
Does you Authority have a 'Development and Air Quality Supplementary Planning Document' or similar?	YES
Is the likely impact on air quality split in to 'bands' depending upon the severity of the impact? How many 'bands'?	Yes Four
What criterion is used to trigger these 'bands'?	
Band 1	developments with a very small potential impact
Band 2	medium scale developments that, together with other developments, would have a contributory impact.
Band 3	development that individually is likely to have a significant impact and, for which, an air quality assessment and mitigating and compensating measures will be required
Band 4	developments with a substantial potential impact for

	which adequate mitigation or compensating measures cannot be achieved.
At which 'band' is an air quality assessment required for a proposed new development?	Band 3 & 4
Where the air quality impact of a proposed new development is assessed as being 'significant' or worse is a financial contribution sought from the developer? If so, how is this calculated?	Yes In accordance with DMRB guidance
Does the policy deal with the mitigation of adverse air quality impacts during the construction phase?	Yes via a planning condition requiring a 'construction environmental management plan'