Report

QA/QC Data Ratification Report for the Automatic Urban and Rural Network, April-June 2006

A report produced for the Department for Environment, Food and Rural Affairs, Scottish Executive, Welsh Assembly Government and the DoE in Northern Ireland

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Executive Summary

Netcen carries out the quality assurance and control (QA/QC) activities for the Automatic Urban and Rural Monitoring Network (AURN) on behalf of the UK Department for Environment, Food and Rural Affairs (Defra) and the Devolved Administrations (DAs). This report provides a review of data ratification issues for the 3-month period April-June 2006.

In general this has been a very good 3-month period for the AURN with a network average data capture of 92.3% being achieved. All pollutants exceeded the target of 90%. Again, there were some sites affected by relocation or temporary closure, which resulted in reduced data capture.

DATA RATIFICATION REPORT APRIL-JUNE 2006

1 Introduction

This quarterly report covers the Quality Assurance and Control (QA/QC) activities undertaken by netcen to ratify automatic monitoring data from Defra and the Devolved Administrations' urban and rural air quality monitoring network (AURN) for the period April-June 2006. During this period there were 126 monitoring sites in the Network of which there are 88 urban sites, 22 rural sites and a further 14 sites in the London Air Quality Monitoring Network (LAQN) which are affiliated into the national network. There are currently 63 defra-funded sites and 63 affiliate sites. Three sites (Belfast Clara Street, Northampton PM_{10} and Brighton Roadside PM_{10}) measure PM_{10} only and are included as individual sites in the total of 126, although Northampton PM_{10} is co-located with the Northampton AURN site, and Brighton Roadside PM_{10} is close to the Brighton Roadside AURN site.

1.1 Recent Changes in the Network

This section gives an overview of the main changes that have recently taken place in the network, including site closures, relocations or the addition of any new sites to the network. A summary of changes in the AURN for the period is given in Table 1.1.

Table 1.1 Changes in the Network, April-June 2006

Site	Date closed	Date commissioned	Comments
Bristol St Pauls	-	14 June 2006	Relocated from Bristol Centre
Fort William	-	21 June 2006	Final DD3 site

QA/QC Unit has been working closely with Bureau Veritas and the Local Authorities regarding the following site commissionings and relocations:

Southwark Roadside
The analysers at Southwark Roadside were switched off on 21 February following failure of the air conditioning unit. Subsequently, requests have been received from the occupants of the building housing the site to remove the monitoring site. It is hoped that the site will be relocated (with the inlet in the same location, and with a NOx analyser only) in the near future.

Auchencorth Moss
The installation of the analysers at this site has taken place over a period of time. The PM_{10} and $PM_{2.5}$ Partisols commenced operation on 1 January 2006, although the data from these have not yet been supplied to the QA/QC Unit. A commissioning audit was, however, carried out in Spring 2006.

Swansea
The Swansea Affiliate monitoring site was closed on 7 August, and has been relocated to a nearby roadside location. The new site details will be published on the AURN hub and in the next QA/QC report.

Exeter Roadside

The temporary analysers at Exeter Roadside were replaced with new, permanent analysers on 7 June (except for NOx, which was replaced on 10 July). The site was audited by the QA/QC unit on 18 July, which serves as a commissioning audit.

1.2 Overview of Network Performance

Ratified hourly average data capture for the network averaged 92.3% for all pollutants (O_3, NO_2, SO_2, CO, PM_{10} and $PM_{2.5}$) during the 3-month reporting period April-June 2006 (see Table 1.2 below). All pollutants had average data captures above the required 90% during this quarter. The annual average network data capture for the calendar year 2005 was 91%.

Table 1.2 AURN Ratified Data Capture (%) by Quarter, 2006 (Using the start date of any new site)

Data Capture (%)	CO	NO_2	O_3	PM_{10}	$PM_{2.5}$	SO_2	Network Average
Q1 Jan-Mar 2006	90.1	89.9	91.0	94.7	98.1	90.9	90.4
Q2 Apr-June 2006	90.7	91.9	94.0	96.0	96.4	93.3	92.3

Overall, 359 out of the 422 analysers (84%) achieved data capture levels above the required 90% target during this reporting period (See Table 1.3).

Table 1.3 Number of Analysers with Data Capture below 90%

Total Number of Analysers		Q1 Jan-Mar 2006	Q2 Apr-June 2006
CO	77	17	15
NO_2	109	20	23
O_3	87	14	9
PM_{10}	70*	8	8
$PM_{2.5}$	4	0	0
SO_2	75	16	15
Total <90%	422	75	70

*Includes TEOMs and Partisols

In total, 26 out of the 126 operational network sites (21%) had an average data capture rate below the required 90% level for the April-June 2006 period. These sites are listed in Table 1.4. The main site operational and QA/QC issues giving rise to data capture below the required 90% level are summarised in Section 4. A summary of the main recommendations made in this report to help improve network performance is given in Appendix A4.

Table 1.4 Sites with Average Data Capture < 90%, April-June 2006 (Data capture calculated from site start date)

Site	Owner	Site Average
England		
Bath Roadside	Affiliate	69.3
Birmingham Tyburn	Affiliate	89.4
Brentford Roadside	Affiliate	73.5
Bury Roadside	Affiliate	85.9
Cambridge Roadside	Affiliate	89.4
High Muffles	DEFRA	67.7
Ladybower	DEFRA	86.1
London Bromley	Affiliate	59.1
London Cromwell Road 2	DEFRA	89.8
London Hackney	Affiliate	56.1
London Haringey	Affiliate	83.1
London Marylebone Road	DEFRA	87.5
London Southwark	Affiliate	68.4
London Westminster	DEFRA	74.1
Lullington Heath	DEFRA	86.0
Manchester Town Hall	DEFRA	39.4
Rotherham Centre	Affiliate	80.9
Southwark Roadside	Affiliate	0.0
St Osyth	DEFRA	89.3
Tower Hamlets Roadside	Affiliate	88.1
Walsall Willenhall	Affiliate	87.0
West London	DEFRA	76.9
N Ireland		
Derry	Affiliate	87.1
Scotland		
Glasgow Kerbside	DEFRA	88.3
Wales		
Aston Hill	DEFRA	57.7
Narberth	Affiliate	86.2

1.3 LSO Manual

Copies of the Local Site Operator's manual on disc (CD) were distributed to the network participants at the annual LSO meeting in December 2004. If LSOs have not received a copy or further copies are required please contact Andy.Cook@aeat.co.uk. The manual is also available electronically on the following web sites:
AURN Hub http://www.aeat.co.uk/com/AURNHUB/lsoman.html
Air Quality Archive
http://www.aeat.co.uk/netcen/airqual/reports/lsoman/lsoman.html

Updates to cover the new FDMS TEOM analysers are under preparation and will be distributed to relevant parties shortly.

1.4 AURN Hub Updates

The AURN project information hub website is located at[1]:
http://www.aeat.co.uk/com/AURNHUB/index.html.

The site is regularly up-dated and some of the more recent information includes:

- Up-dated site lists (July 2006) and critical site list (July 2006)
- Monthly PM_{10} (Gravimetric) exceedences up to July 2006
- QA/QC Unit's data ratification and intercalibration report, January-March 2006
- Recent Management Unit reports (April-June 2006)

The Hub has continued to provide a valuable source of information for interested organisations-see Figure 1.1

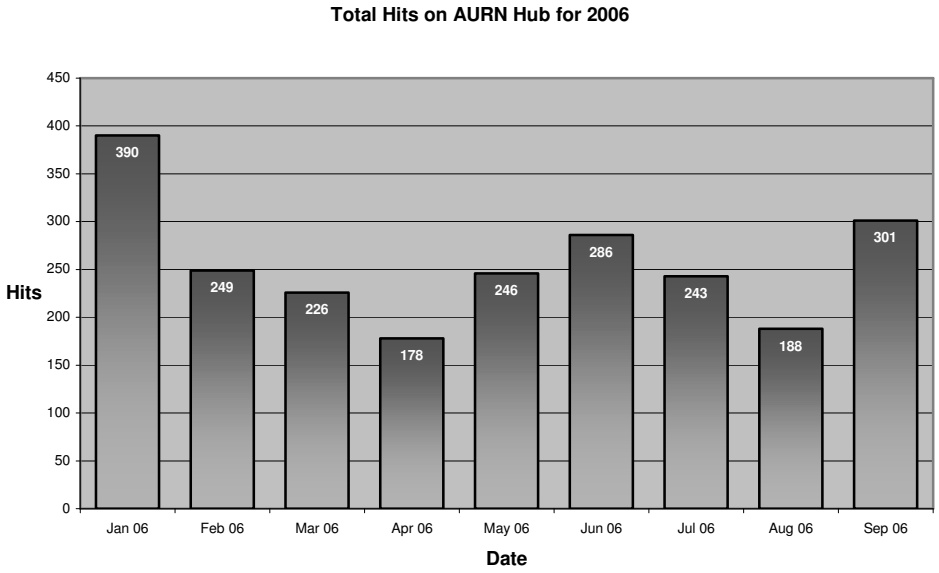

Figure 1.1 AURN Hub Monthly Usage Statistics January-September 2006

2 Generic Data Quality Issues

2.1 Progress on Monitoring Requirements of the EU Daughter Directives

Installation of all of the additional NO_x and O_3 analysers at existing sites required to comply with the third Daughter Directive (DD3) has now been completed. Further details on the third Daughter Directive can be found at:
http://www.defra.gov.uk/environment/consult/air-23daughter/index.htm

The remaining site needed to meet the requirements of DD3 has been installed at Fort William. This site commenced operation on 22 June 2006.

[1] Password protected site: username and password available from stephen.bird@aeat.co.uk

2.2 Data Capture for Critical Sites in Zones and Agglomerations

In order to meet the requirements of the Daughter Directives, any zone or agglomeration[2] with an exceedence of the limit value must be formally reported to the Commission. The critical sites are those which, if data capture falls below 90%, there will be insufficient data for the whole zone or agglomeration. In most cases the critical sites are those where there is only one site in the zone or agglomeration. However, for some pollutants (especially ozone) monitoring is required at several sites in each zone or agglomeration and hence these may all need to be classified as critical sites for that pollutant. The list of the critical sites in the Network necessary to meet the requirements of the first, second and third Daughter Directives is given in Appendix A2. In total 61 sites (195 analysers) have been identified as critical for DD1, DD2 or DD3 (25 sites in agglomerations and 36 in zones).

Data capture for all 61 of the critical sites during the 3-month period April-June 2006 is given in Section 5, Table 5.2. The critical sites with less than 90% total data capture and the main reasons for data loss at these sites are given in Table 2.1 below. In total, 25 out of the 186 critical site analysers (13%) did not meet the required 90% data capture during the period April-June 2006. Note that some critical sites also measure other pollutants, which are not themselves critical.

Table 2.1 Critical sites with <90% data capture, April-June 2006

Network Data Capture for 01/04/2006 to 30/06/2006 from start date of any new site
Just sites with average data capture < 90%

Site	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average	Principle reason for loss
England								
High Muffles	-	-	**62.5**	**72.9**	-	-	**67.7**	Communications fault, power cuts
St Osyth	73.8	-	**94.6**	**99.6**	-	-	**89.3**	CO fault. No documentation supplied to QA/QC Unit
N Ireland								
Derry	**97.8**	**98.3**	**97.8**	**50.9**	-	**91.0**	**87.1**	O_3 pump fault
Wales								
Aston Hill	-	-	**20.0**	**95.5**	-	-	**57.7**	Spurious data, possibly sampling fault
Narberth	-	93.0	98.5	**94.0**	-	59.1	**86.2**	Unstable analyser following service. New analyser fitted May.

Shaded boxes are for data capture < 90%
Bold data captures are for critical instruments and sites

[2] A definition of zones and agglomerations can be found under "Article 5 Assessment Zones and Agglomerations Monitoring Maps" at http://www.defra.gov.uk/environment/airquality/index.htm

Recommendation

Every effort should be made to ensure that data capture is maximised for the critical sites. LSOs and ESUs should undertake call-outs and repairs as soon as possible to avoid unnecessary data loss at these sites.

2.3 Gravimetric PM_{10} Data Ratification

Gravimetric PM_{10} analysers (Partisols) are located at eight sites in the network (Bournemouth, Northampton, Wrexham, Dumfries, Inverness, London Westminster, Auchencorth Moss (PM_{10} and $PM_{2.5}$) and Brighton Roadside PM_{10}). The gravimetric PM_{10} analyser at Northampton is also co-located with a TEOM analyser, which provides a comparison of data from the two techniques. Gravimetric PM_{10} concentrations and the daily mean TEOM scaled by 1.3 at Northampton for the 3-month period April-June 2006 are shown in Figure 2.1.

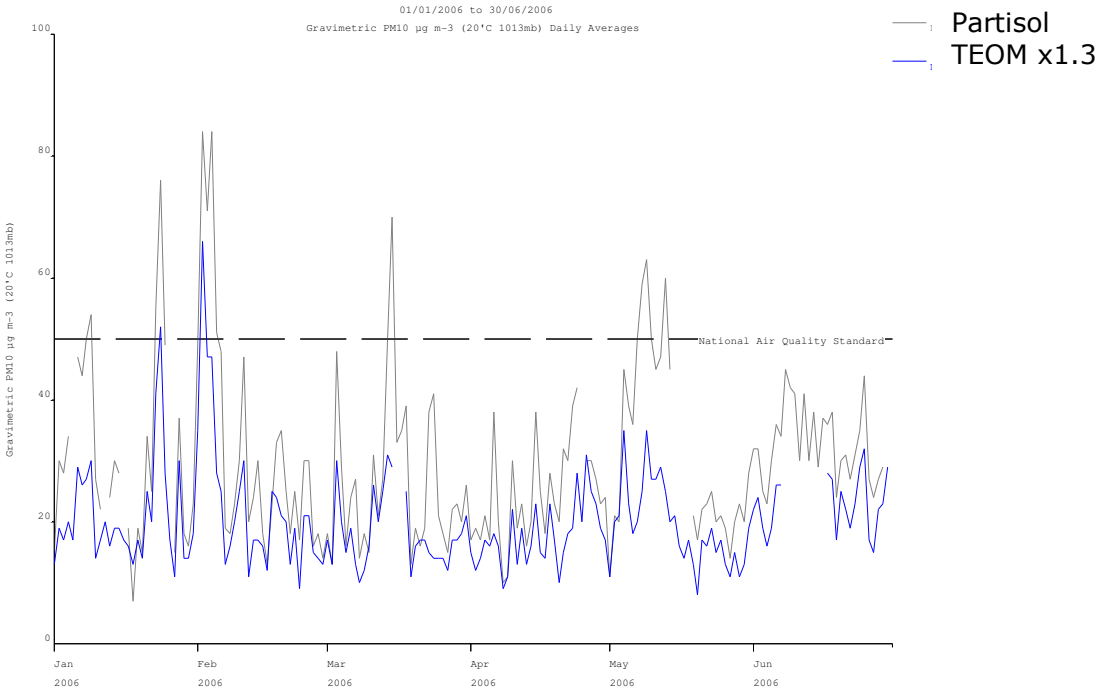

Figure 2.1 Partisol and TEOM (x1.3) Concentrations at Northampton (January-June 2006)

Data capture for the gravimetric PM_{10} (Partisol) analysers for the period April-June 2006 is given in Table 2.3. Six of the seven sites for which data are available exceeded the 90% data capture target in this quarter, with average data capture over all seven analysers of 93.7%. Bournemouth is the one remaining Partisol unit that still needs to be connected to telemetry via a separate mobile phone system, as the existing line is not compatible with the Partisol software.

No data for Auchencorth Moss have yet been received for ratification by the QA/QC Unit. Some provisional results for a pollution episode in May 2006, soon after the instruments were commissioned, are described below for interest.

Table 2.3 Gravimetric PM_{10} Data Capture (%) 2006

Site	3-months Data Capture (%) April-June 2006
Auchencorth Moss	N/a
Bournemouth	98.9
Brighton Roadside PM_{10}	100.0
London Westminster	93.4
Northampton	94.5
Dumfries	94.5
Inverness	84.6
Wrexham	90.1
Average (exc. Auchencorth Moss)	**93.7**

Bureau Veritas has supplied the measured data, undertaken the filter weighing and calculated the particulate concentrations; netcen has ratified the results.

Daily Partisol measurements of PM_{10} and $PM_{2.5}$ taken at Auchencorth Moss, located 10 miles south of Edinburgh, indicate that a particulate cloud over Scotland in early May was composed of approximately 80 % by mass-volume $PM_{2.5}$ compared with the PM_{10} fraction. $PM_{2.5}$ is a particle size normally associated with the accumulation mode of particle formation, primarily the result of combustion sources and not with natural sources such as mechanically generated particles from wind blown suspended soils or non-combusted plant debris. Figure 2.2 shows the comparison of daily averaged $PM_{2.5}$ concentration with PM_{10} at Auchencorth Moss. The provisional partisol measurements for this period were supplied to the Netcen Air Quality Forecasting team by Bureau Veritas.

Particle Episode at Auchencorth Moss-Provisional Data

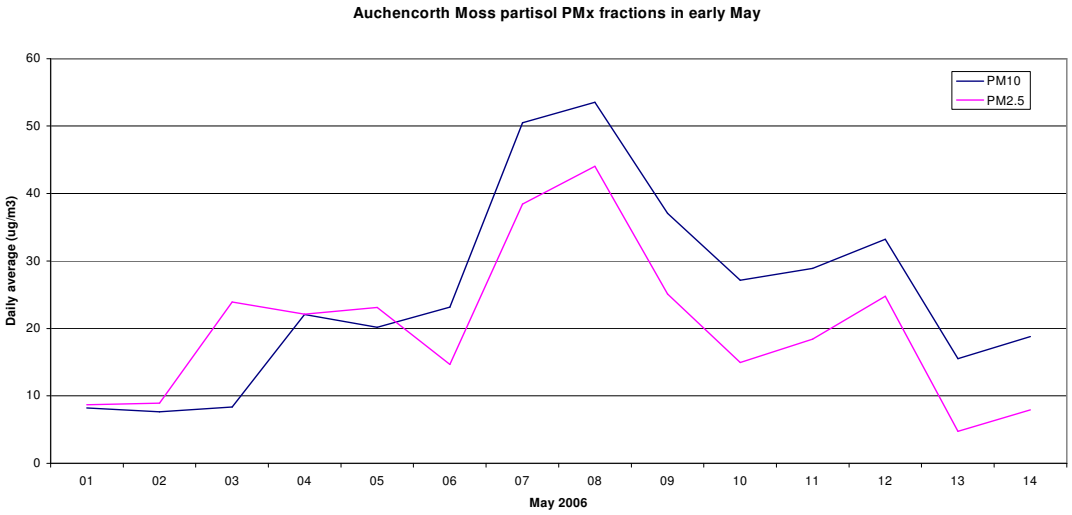

Figure 2.2 Measured Concentrations of PM_{10} and $PM_{2.5}$ at Auchencorth Moss, May 2006

Figure 2.3 below shows the path of easterly air trajectories to the north of the UK from Russia during the height of the air pollution episode on May 7th. Intense forest fires were burning in this region during early May.

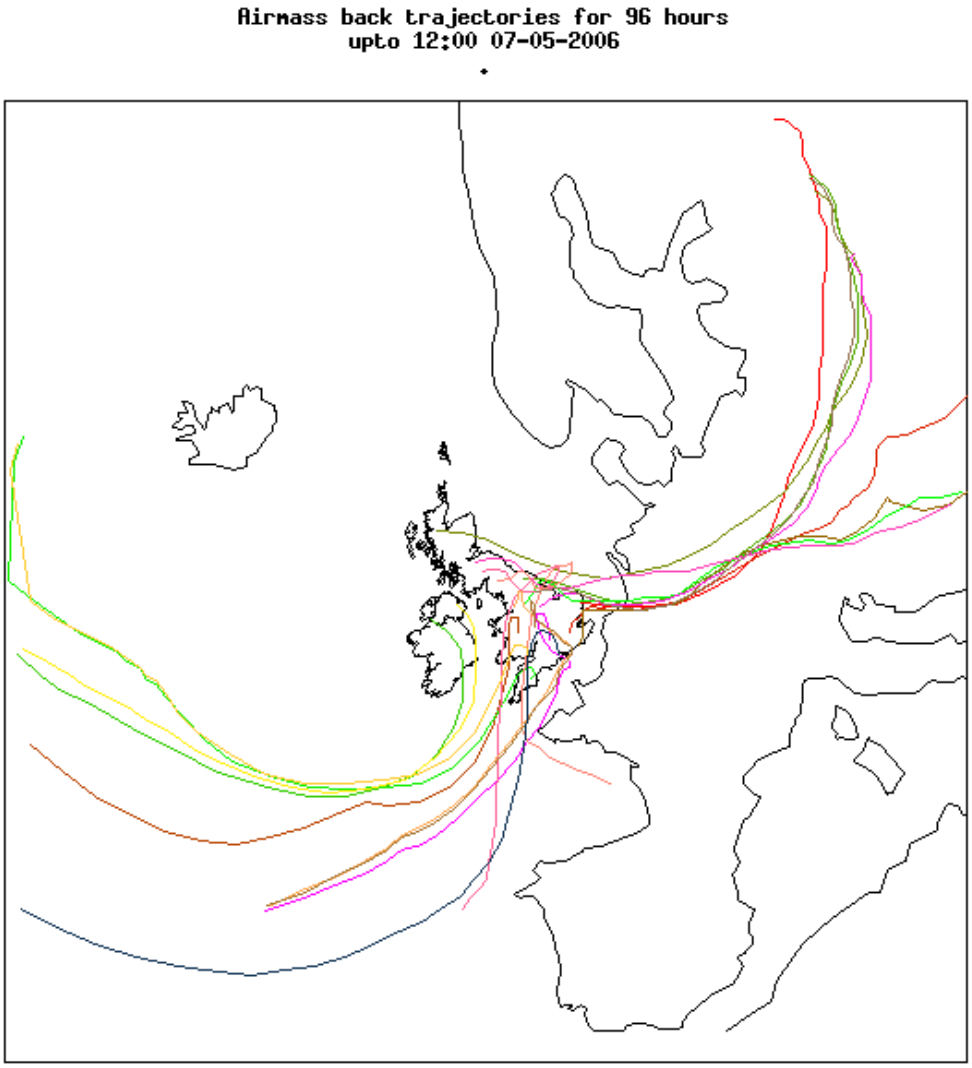

Figure 2.3 Air Trajectories for 7th May 2006

For further details please see the full report on this incident which is due to be published shortly on the Air Quality Archive at http://www.airquality.co.uk/archive/reports/reports.php?action=category&section_id=12

2.4 Auto-Calibration Run-ons

Autocalibration "run-on" is a generic problem affecting many analysers in the network and is due to autocalibration gas leaking into the sampling system during the ambient measurement period immediately after the autocalibration cycle. The

problem can be identified by examining the diurnal variation of pollutant concentrations for the individual sites. Invalid measurements (usually between 01:30 and 02:00) have been removed during data ratification. This can be a serious source of data loss resulting in one hour out of twenty four being deleted, which is 4% of the annual data capture. At some sites significantly more data are being lost resulting in data capture below the 90% data capture target for the period.

The ESUs have investigated the autocalibration run-ons at many of the sites and tried different ways to resolve the problem including thorough cleaning of the solenoid valves and installation of Permapure or silica gel driers. In most cases this has improved the situation but it has not always eliminated the problem completely. The 42 sites (47 analysers) showing continuing problems with the autocalibration run-on during April-June 2006 are given in Table 2.5. Any autocalibration run-on data that look visibly significant have been deleted from these data sets during ratification.

Table 2.5 Estimate of Spike or Dip due to Auto-calibration Run-on: April-June 2006

Site	Pollutant	Run-On Conc	Autocal Conc	Period	Hours lost per day
Blackpool Marton	CO	<0.05ppm	30	Apr-June	1
Brighton Roadside	CO	0.1	30	Apr-June	1
London Hillingdon	CO	0.05	35	Apr & June	1
London Marylebone Road	CO	0.05	20.4	May	1
Aberdeen	NO2	4ppb	200	Apr-June	1
Barnsley Gawber	NO2	2	350	Apr & June	1
Belfast Centre	NO2	8	300	Apr-June	1
Birmingham Centre	NO_2	9	750	Apr-June	1
Blackpool Marton	NO_2	4	1000	May-June	1
Bournemouth	NO_2	4	600	Apr-June	1
Brighton Preston Park	NO_2	2	1000	June	1
Bristol St Paul's	NO_2	7	600	June	1
Bury Roadside	NO_2	8	700	Apr-June	1
Dumfries	NO_2	8	700	Apr-May	1
Edinburgh St Leonards	NO_2	3	500	Apr-June	1
Eskdalemuir	NO_2	1.2	500	Apr-June	**3**
Fort William	NO_2	2	350	June	1
Harwell	NO_2	2.9	200	Apr-May	1
Hull Freetown	NO_2	2	200	Apr-May	1
Leamington Spa	NO_2	4	750	Apr-May	1
Leominster	NO_2	3	500	Apr-June	**2**
London Bloomsbury	NO_2	6	700	Apr-May	1
London Bromley	NO_2	9	450	Apr & June	1
Lullington Heath	NO_2	1.4	300	Apr-June	1
Market Harborough	NO_2	0.5	350	May	1
Newcastle Centre	NO_2	4	300	Apr-June	1
Preston	NO_2	2	500	Apr-June	1
Southampton Centre	NO_2	4	850	Apr-June	1
St Osyth	NO_2	2	300	Apr-June	1
Stockport Shaw Heath	NO_2	2	1100	Apr-May	1
Thurrock	NO_2	9	400	Apr-June	1

Site	Pollutant	Run-On Conc	Autocal Conc	Period	Hours lost per day
West London	NO_2	6	650	Apr-June	1
Wicken Fen	NO_2	1.6	280	Apr-June	1
Wrexham	NO_2	5	350	Apr-June	1
Barnsley Gawber	O_3	-6ppb	800	Apr-June	1
Blackpool Marton	O_3	-9	700	Apr-June	1
Bradford Centre	O_3	-5	1200	Apr-June	1
Derry	O_3	-3	1000	May-June	1
Narberth	O_3	-1	700	Apr-June	1
Preston	O_3	-4	650	Apr-June	1
Reading New Town	O_3	-4	3000	Apr-June	1
Wirral Tranmere	O_3	-4	600	Apr-June	1
Blackpool Marton	SO_2	1ppb	500	Apr	1
London Brent	SO_2	1	900	May-June	1
London Cromwell Road 2	SO_2	<1	325	Apr & June	1
Narberth	SO_2	0.7	500	May-June	1
Plymouth Centre	SO_2	<1	800	Apr - May	1

Eskdalemuir, and Leominster NOx should be prioritised as several hours per day are being lost at these sites. Eskdalemuir was highlighted as a problem in the January-March report. Several sites continue to have autocalibration span concentrations set too high (eg Blackpool Marton, Brighton Preston Park and Stockport Shaw Heath-NO_2 and Bradford Centre, Derry and Reading New Town-SO_2). These should be adjusted, where possible, at the next opportunity.

Recommendations

ESU to investigate and minimise effect where possible, especially at sites with large autocalibration run-ons or where data loss is in excess of 1 hour.
QA/QC Unit and CMCU have held meetings with the Equipment Support Units to discuss the autocalibration run-ons and to identify ways to resolve the problem. Solutions to the problems have been identified in many cases, and the necessary hardware upgrades are being installed either at routine services, or through call-outs.

Eskdalemuir and Leominster should be prioritised as at least 2 hours per day are being lost at these sites.

In the meantime, we recommend that the autocalibration devices be adjusted at the problem sites to reduce the concentration of the span gas. It is strongly advised that NO_2 autocalibration span concentrations of less than 200ppb (urban sites) and 100ppb (rural sites) are used throughout the network.

3 Site Specific Issues

3.1 Glazebury Ozone

The Glazebury ozone analyser has shown a consistent but gradual drift of the calibration factor since the start of 2006. Figure 3.1 shows the calibration plot (lower graph):

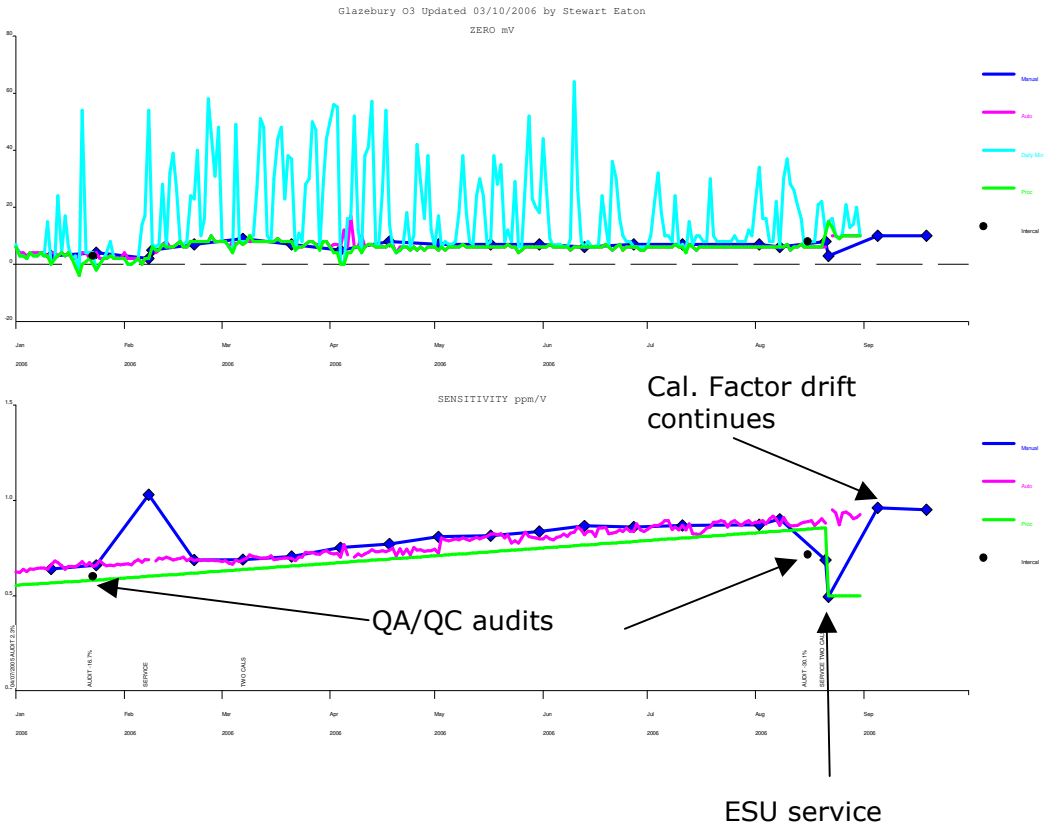

Figure 3.1 Calibration Plots for Glazebury O_3

Although the QA/QC intercomparison results (black dots) were reasonably consistent, the manual calibration (blue) and autocal (pink) show a gradual drift. As these use the same internal ozone source, it is expected that thse should be consistent with each other. Following the service in August, it appears that the analyser continues to drift, and the measured concentrations need rescaling. This type of drift is often a result of a leaking main valve, although this was found not to be the case. The optical bench was cleaned in October and it is hoped that this will rectify the drift. This will be looked at closely in the next quarter.

3.2 Bolton NOx

The NOx analyser at Bolton has performed very poorly for much of the period January-June 2006 (and beyond; problems still reported in September). The analyser produces a very noisy zero baseline, and it is difficult to determine accurately where the baseline is between calibrations. The autocalibrations (pink) are also noisy. Although little data were lost in quarter 2 (capture for quarter 1

was 16.6%), there will likely be data lost in quarter 3. Figure 3.2 shows the calibration zero plot for this analyser, and the noise can clearly be seen:

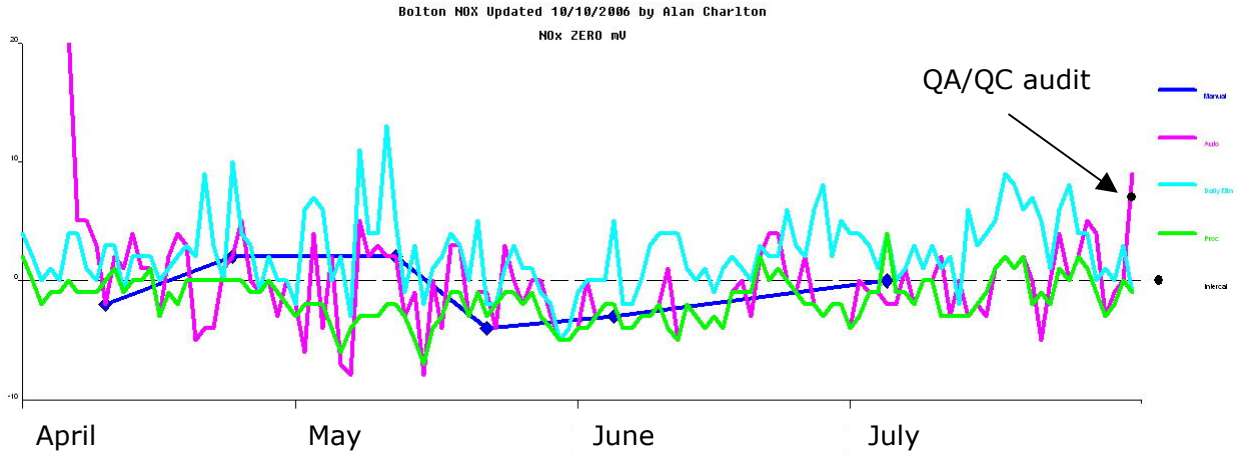

Figure 3.2 Bolton NOx Zero Response Plot

Recommendation

The Bolton Nox analyser should be repaired or replaced

3.3 London Westminster CO

The London Westminster CO analyser has shown an unstable, noisy response, particularly since the ESU service visit on 5 April. This is shown in Figure 3.3.

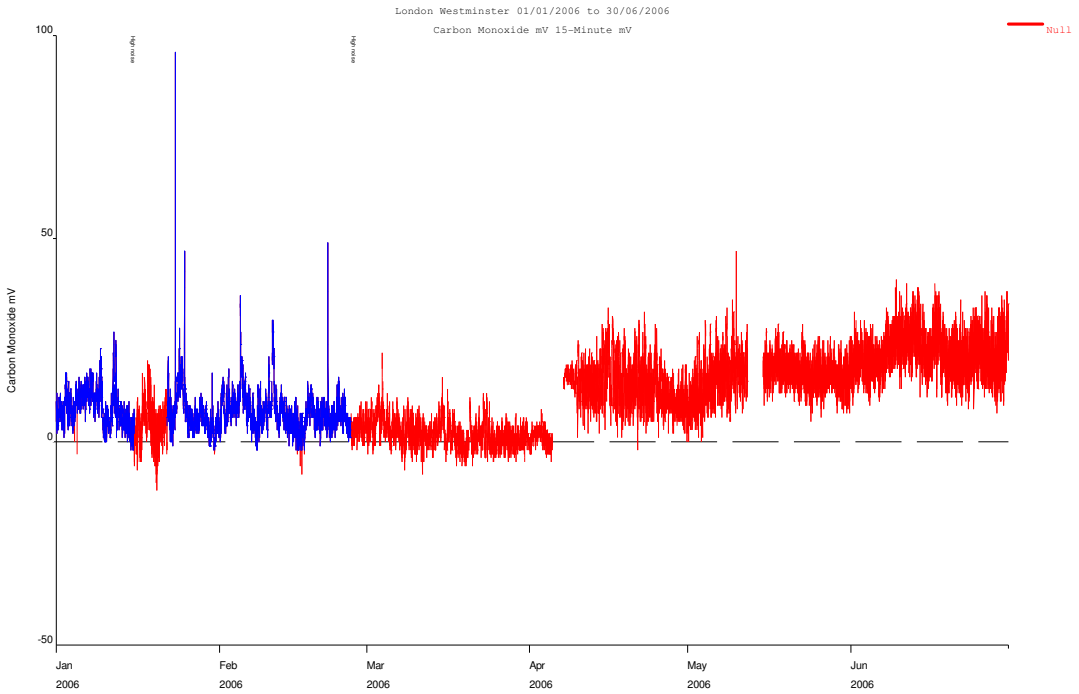

Figure 3.3 15-min average mV Data from London Westminster CO Analyser

The red part of the plot shows data that have been deleted during the ratification process. The poor analyser performance has continued into quarter 3, and it is likely that more data will be lost during 2006. The analyser should be repaired or replaced as soon as possible.

Recommendation

The London Westminster CO analyser should be repaired or replaced.

3.4 Contamination of NO cylinders

During the summer 2006 intercalibration exercise, seven NO cylinders were identified as having drifted in concentration by more than 10%. This includes cylinders where although the total NOx concentration is within acceptable limits, the NO concentration has dropped significantly (converted to NO_2) since the original certification. The sites affected are Leeds, Southampton, Exeter Roadside, Blackpool Marton, Hillingdon, Cwmbran and Preston.

Included in these sites are two where the cylinder valve is left open to allow automatic calibrations to be carried out. As drifting cylinders at such sites have been observed in the past, some work is taking place to investigate whether there is an increased risk of cylinder contamination at these sites. The cylinder supply contractor has been asked to return the above NO cylinders to the QA/QC Unit for recertification. As a result, the NOx data from Billingham, Blackpool Marton, Cwmbran and Leeds have been held as provisional until the cylinders have been recertified.

3.5 Air Conditioning Faults

During the hot weather experienced by much of the country in June and July, many sites showed problems caused by overheating through either inadequate or failed air conditioning systems, or from power problems caused by air conditioning units. Particular problems were noted at Belfast Centre, Bury Roadside, Grangemouth, Liverpool Speke, Redcar, Rotherham Centre, Scunthorpe Town, Sunderland Silkworth, Walsall Alumwell, Brentford Roadside, Lullington Heath, Norwich Centre, Plymouth Centre and Tower Hamlets Roadside. It is possible that other instances of spurious data may be attributable to excessive site temperatures.

3.6 Other Analysers Highlighted in Recent Reports

Several analysers have been highlighted recently as being of concern to the QA/QC unit. An update is given in Table 3.2

Table 3.2 Status of Analysers Highlighted in Previous Reports

Site	Analyser	Fault	Current status
Reading New Town	NO_2	PMT cooler	Now OK
Weybourne	O_3	No manual calibrations or IZS	No progress reported
Salford Eccles	CO	Constant zero baseline	No progress reported
Rural CO analysers	CO	Baseline drift	Drift still evident
Wicken Fen	O_3	Flow	Flow problems continued during Q2 2006
Norwich Centre	SO_2	Large step change between old and replacement analysers	Situation is being closely monitored
Rotherham	SO_2	Very noisy and cyclic response	Analyser now repaired and working satisfactorily
Bush	NOx	Succession of analyser faults	Poor performing analyser failed again on 9 June.
Narberth	O_3	Leak	Quality of O_3 data still uncertain; significant outlier at summer 2006 audit. Installation of duplicate analyser still awaited.
Various	Rural ozone analysers	Temporary instruments installed some of which have no autocals	Two analysers have been upgraded by the manufacturer and are currently under test by the ESU

Recommendation

QA/QC Unit would like to seek clarification from the Equipment Support Unit/manufacturer as to the current situation regarding the reason for the problems and what plans are in place to resolve them. We recommend that immediate attention is given to this issue as the majority of these instruments are located at critical sites.

3.7 Building Works at Sites

The QA/QC unit frequently receive reports of building or other works close to monitoring sites, which may produce unrepresentative pollutant levels for a short period of time. This is particularly relevant for PM_{10} and $PM_{2.5}$.

- For the period 1 April- 30 June, reports of such local works have been received for the following sites:

- Newcastle Centre
- Leamington Spa

Building work is also anticipated at Stockport Shaw Heath.

4 Sites with Data Capture Below 90%

4.1 Sites with Low Data Capture

The following section provides a summary of the main site analyser operational problems, which have resulted in data capture below the required 90% level during the reporting period April-June 2006 (Table 4.1). The number of days and hours of data lost for each cause is also given. In some cases the data gap extends beyond this three-month reporting period.

Table 4.1 Sites with data capture below 90% April-June 2006
(Using the start date of any new site or end date of site closed)

01/04/2006 to 30/06/2006 Gaps in 15-minute table >= 6 hours and data capture <= 90%

Pollutant	Data Capture (%)	Start date	End date	Reason	Comments	Number of days	Number of hours
England							
Bath Roadside							
CO	40.00%	13-Apr-06	06-Jun-06	High noise	Range changed and erratic output	54.1	1299
Birmingham Tyburn							
NO2	58.20%	09-Apr-06	11-Apr-06	Power cut		1.8	43

		26-May-06	07-Jul-06	Instrument fault	NOx channel baseline too high	42	1008
Blackpool Marton							
SO2	84.90%	21-Apr-06	22-Apr-06	No mV data collected		0.8	19
		11-May-06	22-May-06	Pump fault	ENG C/O Replaced pump	11.2	268
Brentford Roadside							
CO	79.20%	12-Jun-06	04-Jul-06	Air Conditioning or Temp fault	site turned off because of air conditioning fault.	22	529
NO2	67.80%	25-May-06	26-May-06	Logger fault	No NOx channel data available.	1	23
		03-Jun-06	05-Jul-06	Air Conditioning or Temp fault	Site turned off because of air conditioning fault.	32.4	778
Bury Roadside							
CO	69.10%	05-Jan-06	06-Apr-06	Sampling fault	Internal sampling data removed up to service	91	2185
		22-Apr-06	23-Apr-06	High noise	Noisy period	0.3	7
		18-May-06	08-Jun-06	Unstable response	Spurious data deleted	21.7	521
SO2	85.90%	09-Apr-06	21-Apr-06	Unstable response	SO2 affected by a/c fault	12.5	299
Cambridge Roadside							
NO2	89.40%	25-Apr-06	26-Apr-06	Unstable response	Spurious data deleted	1	24
		05-May-06	09-May-06	No mV data collected	Long gap after unstable data	3.9	93
		05-Jun-06	05-Jun-06	Instrument fault	Ozonator fault	0.6	15
		16-Jun-06	20-Jun-06	Instrument fault	Blocked ozone capillary	3.9	93
Coventry Memorial Park							
SO2	83.70%	13-Jun-06	27-Jun-06	Flat response	No span gas on site.	14.6	350
Harwell							
O3	80.30%	24-Apr-06	25-Apr-06	Unstable response	UV Lamp fault	1.5	37
		10-May-06	11-May-06	Power cut		0.8	19
		23-May-06	06-Jun-06	Low flow rate	Main valve not working	14.3	342
		16-Jun-06	17-Jun-06	Power cut		0.9	22
High Muffles							
NO2	62.50%	12-May-06	15-Jun-06	Communication fault	Modem failure	33.9	814
O3	72.90%	12-May-06	05-Jun-06	Communication fault	Modem failure	24.3	582
Ladybower							
NO2	59.40%	25-May-06	24-Aug-06	Instrument fault	UV Lamp fault - Nulled by QC	91.1	2187
Leeds Centre							
CO	84.20%	07-Jun-06	21-Jun-06	Sampling fault	LSO C/O Cal. Suspects filter holder was leaking	14.1	339
NO2	73.90%	07-Jun-06	05-Jul-06	Sampling fault	Internal sampling	28	673
Leominster							
NO2	89.70%	04-May-06	04-May-06	Power cut		0.4	10
		05-May-06	05-May-06	Power cut		0.3	8
		07-May-06	07-May-06	Power cut		0.4	9
London Bloomsbury							

NO2	89.70%	11-May-06	15-May-06	Temperature fault	A/C unit failure	3.7	89
		29-Jun-06	30-Jun-06	Power cut		1.7	40
SO2	89.30%	11-May-06	15-May-06	Temperature fault	A/C unit failure	3.9	94
		18-Jun-06	22-Jun-06	Pump fault	Sample flow fault. Pump replaced & lamp adjusted	4.3	104
		29-Jun-06	30-Jun-06	Power cut		1.2	29
London Bromley							
NO2	59.10%	19-Apr-06	23-May-06	Instrument removed for repair		34.5	827
London Cromwell Road 2							
NO2	77.20%	27-Mar-06	20-Apr-06	Sampling fault		24.2	581
		01-Jun-06	02-Jun-06	Power cut		0.7	16
London Hackney							
NO2	69.20%	10-Apr-06	19-Apr-06	Instrument fault	Large baseline and sensitivity shift	9.5	227
		11-May-06	16-May-06	Instrument fault	Large baseline and sensitivity shift	5.6	134
		10-Jun-06	22-Jun-06	Logger fault	ENG C/O Fitted Envidas logger	12.6	303
O3	0.00%	01-Jan-06	31-Jul-06	ESU service	SERVICE	212	5088
London Haringey							
O3	83.10%	02-Jun-06	06-Jun-06	Communication fault	Modem reset	4	96
		12-Jun-06	12-Jun-06	Flat response	Temperature related	0.3	7
		20-Jun-06	30-Jun-06	Logger fault	Call out for CAS failure	10.5	253
London Harlington							
O3	85.90%	04-Apr-06	05-Apr-06	Communication fault	Intermittent comms fault	0.3	6
		05-Apr-06	06-Apr-06	Communication fault	Intermittent comms fault	0.3	6
		10-Apr-06	11-Apr-06	Communication fault	Intermittent comms fault	0.8	19
		17-Apr-06	19-Apr-06	Communication fault	Intermittent comms fault	2.1	51
		22-Apr-06	23-Apr-06	Communication fault	Intermittent comms fault	1	25
		10-May-06	15-May-06	Air Conditioning or Temp fault	Site overheated	4.7	112
		19-May-06	19-May-06	Communication fault	Intermittent comms fault	0.3	6
London Lewisham							
NO2	86.30%	10-Apr-06	22-Apr-06	Sampling fault	NO cylinder regulator faulty - venting cylinder.	12	288
London Marylebone Road							
CO	60.40%	01-Apr-06	04-May-06	Instrument fault	Sync warning then loose internal zero air supply.	33.1	794
		21-May-06	23-May-06	Power cut	Unstable data deleted following power cut	1.5	36
SO2	85.50%	01-Apr-06	03-Apr-06	Power cut		2.4	57
		12-Apr-06	13-Apr-06	ESU service		1.1	26
		21-May-06	22-May-06	Power cut		1	25
		12-Jun-06	14-Jun-06	Unstable response	Spurious data deleted	2.5	59
		25-Jun-06	06-Jul-06	Unstable response	Spurious data deleted	11.1	267
London N. Kensington							
O3	83.60%	04-Apr-06	18-Apr-06	Instrument fault	Measurement bench very dirty	14.5	347

					caused by a faulty valve .		
London Southwark							
O3	0.00%	01-Jan-06	31-Jul-06	ESU service	SERVICE 6 month service + return and install O3 analyser after repair	212	5088
London Westminster							
CO	0.00%	26-Feb-06	31-Aug-06	High noise	Noisy response	187	4488
SO2	89.70%	05-Apr-06	07-Apr-06	ESU service	SERVICE Six Monthly Service Visit	2.1	50
		12-May-06	15-May-06	Power cut		2.9	70
		08-Jun-06	12-Jun-06		ENG C/O UV Lamp Warning. Replaced lamp	3.8	91
Lullington Heath							
SO2	71.20%	02-Mar-06	04-Apr-06	ESU service	SERVICE Replaced manifold fan	33.1	795
		19-May-06	19-May-06	Power cut		0.7	17
		09-Jun-06	03-Jul-06	Air Conditioning fault	Overheating	24.3	582
Manchester Town Hall							
CO	0.00%	01-Jan-06	03-Jul-06	Unstable response	CAS installed. Odessa logger removed	184	4405
NO2	78.90%	12-Mar-06	19-Apr-06	Unstable response	Regular downspikes in data	38.4	922
Newcastle Centre							
NO2	76.20%	22-May-06	09-Jun-06	Logger fault	Engineer suspects instability dur to logger fault	18.1	434
Nottingham Centre							
SO2	89.10%	03-May-06	12-May-06	Instrument fault	ENG C/O Analyser UV lamp needed replacement	9.4	225
Reading New Town							
NO2	78.30%	18-Feb-06	20-Apr-06	Instrument fault	PMT temp high	61.4	1473
Rotherham Centre							
O3	73.10%	02-Apr-06	24-Apr-06	Unstable response	Erratic response - average function incorrect	21.5	515
		08-May-06	11-May-06	Power cut	ENG C/O Pump had tripped power	2.9	69
SO2	72.80%	01-Dec-05	24-Apr-06	ESU service		144	3467
		09-May-06	09-May-06	Power cut	O3 pump had tripped power	0.3	8
		09-May-06	10-May-06	Power cut	O3 pump had tripped power	0.9	22
Somerton							
NO2	89.10%	17-Feb-06	10-Apr-06	Instrument fault	PMT fault	52.5	1259
Southampton Centre							
CO	79.30%	29-Apr-06	06-May-06	Instrument fault	Replace converter and correlation wheel	7.2	172
		17-May-06	22-May-06	Unstable response	Unstable readings	4.4	105
		23-Jun-06	29-Jun-06	Logger fault	Replaced faulty logger	6.5	157
Southwark Roadside							

	0%			No data-see section 1			
St Osyth							
CO	73.80%	23-Apr-06	17-May-06	Instrument fault	Multiple IR & Pump fauilts	23.6	567
Stoke-on-Trent Centre							
NO2	85.90%	12-Apr-06	21-Apr-06	Sampling fault	Internal sampling	9	217
		10-Jun-06	11-Jun-06	No mV data collected		1.7	40
		17-Jun-06	17-Jun-06	No mV data collected		0.7	17
Tower Hamlets Roadside							
CO	76.60%	10-Jun-06	08-Jul-06	Air Conditioning or Temp fault	Switched off due to an air conditioning fault.	28	672
Walsall Willenhall							
NO2	87.00%	19-Jun-06	04-Jul-06	Instrument removed for repair	Cooling fan fault analyser removed	15	361
West London							
CO	58.50%	23-Mar-06	08-May-06	Unstable response	Source fault - detector replaced.	46	1105
Wicken Fen							
SO2	79.50%	09-May-06	13-May-06	Air Conditioning or Temp fault	Erratic data nulled due to aircon fault	3.8	91
		02-Jun-06	16-Jun-06	Air Conditioning or Temp fault	Erratic data nulled due to aircon fault	13.9	334
N Ireland							
Derry							
O3	50.90%	07-Apr-06	18-May-06	Pump fault	response change	41.5	997
		09-Jun-06	10-Jun-06	No mV data collected	No data collected	0.9	22
Scotland							
Bush Estate							
NO2	87.80%	09-Jun-06	20-Jun-06	Low flow rate	Flow Fault - Pressure Sensored replaced	10.9	261
Eskdalemuir							
Glasgow Kerbside							
CO	88.60%	05-Jun-06	14-Jun-06	Air Conditioning or Temp fault	ENG C/O Replaced air con	9.4	226
NO2	87.50%	05-Jun-06	14-Jun-06	Air Conditioning or Temp fault	ENG C/O Replaced air con	9.9	237
Grangemouth							
CO	89.40%	13-Apr-06	13-Apr-06	Power cut		0.3	7
		10-Jun-06	16-Jun-06	Instrument fault	ENG C/O Replaced chopper motor	6.4	153
		24-Jun-06	27-Jun-06	Monitoring suspended	Site switched off to protect equipment	2.6	62
Wales							
Aston Hill							
NO2	20.00%	24-Mar-06	12-Jun-06	Sampling fault	Manifold fan fault	80.1	1922

Cwmbran							
SO2	65.60%	25-Apr-06	26-Apr-06	ESU service		1	25
		01-Jun-06	31-Jul-06	Unstable response	Spurious data deleted	61	1464
Narberth							
SO2	59.10%	29-Mar-06	05-May-06	ESU service		37.3	894
Wrexham							
SO2	89.80%	04-Apr-06	07-Apr-06	Instrument fault	ENG C/O RS232 fault	3	72
		10-Apr-06	11-Apr-06	No mV data collected	Engineer callout remote reboot	0.6	15
		12-May-06	13-May-06	Instrument fault	Call out: SO2 instrument pmt temperature fault	0.7	17
		17-May-06	17-May-06	Instrument fault	ENG C/O PMT temp fault	0.3	7
		24-May-06	25-May-06	No mV data collected	Mostly missing mVs- cause unknown not weekend data	1.2	29
		06-Jun-06	08-Jun-06	Instrument fault	ENG C/O Replaced faulty CPU card.	2.1	50

5 Ratified Data Capture Statistics

Table 5.1 provides the ratified data capture figures for each site for the 3-month period April-June 2006. Data capture values below 90% are shown in the shaded boxes.

Table 5.1 Ratified Network Data Statistics April-June 2006
(Using the start date of any new site or end date of site closed)

Network Data Capture for 01/04/2006 to 30/06/2006 from start date of any new site

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
England								
Barnsley 12	DEFRA	-	-	-	-	-	95.6	95.6
Barnsley Gawber	Affiliate	**99.6**	-	**96.1**	**95.5**	-	99.5	**97.7**
Bath Roadside	Affiliate	40.0	-	98.7	-	-	-	69.3
Billingham	DEFRA	-	-	99.5	-	-	-	99.5
Birmingham Centre	DEFRA	96.6	99.5	95.3	99.4	-	99.6	98.1
Birmingham Tyburn	Affiliate	97.5	96.1	58.2	97.5	-	97.5	89.4
Blackpool Marton	DEFRA	**93.0**	**98.5**	**95.3**	**94.2**	-	**84.9**	**93.2**
Bolton	Affiliate	98.8	98.7	98.4	98.9	-	98.9	98.8
Bottesford	Affiliate	-	-	-	99.5	-	-	99.5
Bournemouth	Affiliate	**96.8**	**98.9**	**95.2**	**99.8**	-	**99.7**	**98.1**
Bradford Centre	DEFRA	92.7	95.1	94.4	90.4	-	91.1	92.7
Brentford Roadside	Affiliate	79.2	-	67.8	-	-	-	73.5
Brighton Preston Park	DEFRA	-	-	**97.0**	**98.0**	-	-	**97.5**
Brighton Roadside	Affiliate	95.4	-	99.6	-	-	-	97.5
Brighton Roadside PM_{10}	Affiliate	-	**100.0**	-	-	-	-	**100.0**

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
Bristol Old Market	Affiliate	99.9	-	99.7	-	-	-	99.8
Bristol St Paul's	DEFRA	96.6	96.1	92.2	96.4	-	95.1	95.3
Bury Roadside	Affiliate	69.1	92.4	90.5	91.5	-	85.9	85.9
Cambridge Roadside	Affiliate	-	-	89.4	-	-	-	89.4
Camden Kerbside	Affiliate	-	89.5	96.0	-	-	-	92.8
Canterbury	Affiliate	-	**99.5**	99.6	-	-	-	**99.6**
Coventry Memorial Park	DEFRA	**99.6**	**99.8**	**99.6**	**99.2**	-	**83.7**	**96.4**
Exeter Roadside	Affiliate	99.1	-	98.1	99.4	-	99.4	99.0
Glazebury	DEFRA	-	-	**99.5**	**99.6**	-	-	**99.5**
Great Dun Fell	DEFRA	-	-	-	**99.9**	-	-	**99.9**
Haringey Roadside	Affiliate	-	99.5	94.2	-	-	-	96.9
Harwell	DEFRA	-	97.7	92.5	80.3	97.2	93.2	92.2
High Muffles	DEFRA	-	-	**62.5**	**72.9**	-	-	**67.7**
Hove Roadside	Affiliate	99.4	-	99.5	-	-	**99.6**	**99.5**
Hull Freetown	DEFRA	**99.3**	**99.4**	**95.1**	**99.4**	-	**99.4**	**98.5**
Ladybower	DEFRA	-	-	59.4	99.5	-	99.5	86.1
Leamington Spa	Affiliate	**99.6**	**99.6**	**95.1**	**98.5**	-	**99.5**	**98.5**
Leeds Centre	DEFRA	84.2	99.8	73.9	99.6	-	99.6	91.4
Leicester Centre	DEFRA	**98.0**	**97.5**	**98.0**	**98.0**	-	**98.0**	**97.9**
Leominster	DEFRA	-	-	**89.7**	**98.4**	-	-	**94.1**
Liverpool Speke	Affiliate	**99.4**	**99.2**	**99.1**	**98.8**	-	**96.6**	**98.6**
London A3 Roadside	DEFRA	98.2	98.2	97.9	-	-	-	98.1
London Bexley	Affiliate	99.1	88.8	99.7	99.3	-	98.9	97.1
London Bloomsbury	DEFRA	94.0	94.7	89.7	94.0	94.5	89.3	92.7
London Brent	Affiliate	99.6	99.7	99.0	99.7	-	96.7	98.9
London Bromley	Affiliate	-	-	59.1	-	-	-	59.1
London Cromwell Road 2	DEFRA	97.9	-	77.2	-	-	94.4	89.8
London Eltham	Affiliate	-	98.3	98.4	91.6	-	92.1	95.1
London Hackney	Affiliate	99.2	-	69.2	0.0	-	-	56.1
London Haringey	Affiliate	-	-	-	83.1	-	-	83.1
London Harlington	Affiliate	99.5	99.5	98.8	85.9	-	-	95.9
London Hillingdon	DEFRA	96.7	99.1	97.4	99.5	-	99.5	98.4
London Lewisham	Affiliate	-	-	86.3	99.7	-	96.1	94.0
London Marylebone Road	DEFRA	60.4	95.1	94.0	94.4	95.6	85.5	87.5
London N. Kensington	Affiliate	99.3	99.3	99.4	83.6	-	97.5	95.8
London Southwark	Affiliate	87.0	-	99.5	0.0	-	87.0	68.4

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
London Teddington	Affiliate	-	-	99.0	99.6	-	99.6	99.4
London Wandsworth	Affiliate	-	-	99.5	99.6	-	-	99.6
London Westminster	DEFRA	0.0	93.4	93.6	94.0	-	89.7	74.1
Lullington Heath	DEFRA	-	-	91.5	95.4	-	71.2	86.0
Manchester Piccadilly	DEFRA	96.3	96.1	98.9	96.3	-	99.0	97.3
Manchester South	Affiliate	-	-	92.3	99.4	-	94.5	95.4
Manchester Town Hall	DEFRA	0.0	-	78.9	-	-	-	39.4
Market Harborough	DEFRA	98.8	-	96.5	99.6	-	-	98.3
Middlesbrough	Affiliate	96.3	99.8	99.6	99.9	-	99.8	99.1
Newcastle Centre	DEFRA	**99.6**	**98.9**	**76.2**	**99.5**	-	**99.5**	**94.8**
Northampton	Affiliate	**99.6**	**90.1**	**99.4**	**99.6**	-	**99.6**	**97.6**
Northampton PM_{10}	Affiliate	-	**94.5**	-	-	-	-	**94.5**
Norwich Centre	DEFRA	99.7	84.2	**99.7**	**99.8**	-	99.7	**96.6**
Norwich Forum Roadside	Affiliate	-	-	97.9	-	-	-	97.9
Nottingham Centre	DEFRA	**99.5**	**99.5**	**99.3**	**99.4**	-	**89.1**	**97.4**
Oxford Centre Roadside	Affiliate	**99.5**	-	98.4	-	-	**99.3**	**99.0**
Plymouth Centre	DEFRA	99.7	**72.5**	99.1	99.8	-	97.0	**93.6**
Portsmouth	Affiliate	**99.6**	**99.9**	**99.8**	**99.8**	-	**96.1**	**99.0**
Preston	DEFRA	**99.5**	**99.3**	**92.4**	**93.7**	-	**98.1**	**96.6**
Reading New Town	DEFRA	**99.5**	**97.0**	**78.3**	**95.5**	-	**99.6**	**94.0**
Redcar	Affiliate	93.4	91.7	92.5	93.5	-	91.8	92.6
Rochester	Affiliate	-	84.0	99.5	99.6	98.4	99.6	96.2
Rotherham Centre	Affiliate	-	-	96.9	73.1	-	72.8	80.9
Salford Eccles	Affiliate	99.0	95.7	99.0	99.0	-	98.7	98.3
Sandwell West Bromwich	Affiliate	99.3	-	99.5	99.2	-	99.6	99.4
Scunthorpe Town	Affiliate	-	**98.6**	-	-	-	97.7	**98.2**
Sheffield Centre	DEFRA	99.6	**96.5**	99.3	99.6	-	94.5	**97.9**
Sheffield Tinsley	DEFRA	99.7	-	99.6	-	-	-	99.7
Sibton	DEFRA	-	-	-	**99.6**	-	-	**99.6**
Somerton	Affiliate	-	-	**89.1**	**99.2**	-	-	**94.1**
Southampton Centre	DEFRA	**79.3**	**99.2**	**95.3**	**99.0**	-	**99.4**	**94.5**
Southend-on-Sea	DEFRA	**99.5**	**96.5**	**99.5**	**99.5**	-	**99.6**	**98.9**
Southwark Roadside	Affiliate	0.0	-	0.0	-	-	0.0	0.0
St Osyth	DEFRA	73.8	-	**94.6**	**99.6**	-	-	**89.3**
Stockport	Affiliate	99.9	99.8	96.6	-	-	99.1	98.8

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
Shaw Heath								
Stockton-on-Tees Yarm	Affiliate	**99.9**	**99.7**	**99.7**	-	-	-	**99.8**
Stoke-on-Trent Centre	DEFRA	**95.9**	**96.8**	**85.9**	**96.6**	-	**96.1**	**94.3**
Sunderland	DEFRA	-	-	-	-	-	**99.5**	**99.5**
Sunderland Silksworth	Affiliate	-	-	**99.4**	**99.5**	-	-	**99.5**
Thurrock	Affiliate	99.6	99.8	**95.1**	**99.6**	-	99.6	**98.8**
Tower Hamlets Roadside	Affiliate	76.6	-	99.6	-	-	-	88.1
Walsall Alumwell	DEFRA	-	-	98.5	-	-	-	98.5
Walsall Willenhall	Affiliate	-	-	87.0	-	-	-	87.0
West London	DEFRA	58.5	-	95.3	-	-	-	76.9
Weybourne	Affiliate	-	-	-	100.0	-	-	100.0
Wicken Fen	DEFRA	-	-	**93.8**	**98.1**	-	79.5	**90.5**
Wigan Centre	Affiliate	**97.2**	**96.4**	**98.2**	**96.3**	-	**90.7**	**95.8**
Wirral Tranmere	DEFRA	**97.8**	**97.3**	**94.9**	**94.0**	-	**97.8**	**96.3**
W'hampton Centre	DEFRA	97.6	97.7	97.3	97.6	-	97.6	97.6
Yarner Wood	DEFRA	-	-	**97.2**	**98.4**	-	-	**97.8**
N Ireland								
Belfast Centre	DEFRA	**97.5**	97.4	**93.2**	**97.3**	-	97.3	**96.5**
Belfast Clara St	Affiliate	-	99.5	-	-	-	-	99.5
Belfast East	DEFRA	-	-	-	-	-	98.9	98.9
Derry	Affiliate	**97.8**	**98.3**	**97.8**	**50.9**	-	**91.0**	**87.1**
Lough Navar	DEFRA	-	97.4	-	**97.9**	-	-	**97.7**
Scotland								
Aberdeen	Affiliate	**100.0**	**89.5**	**96.2**	**100.0**	-	**99.6**	**97.1**
Bush Estate	DEFRA	-	-	**87.8**	**98.6**	-	-	**93.2**
Dumfries	DEFRA	**96.9**	**94.5**	**93.6**	-	-	-	**95.0**
Edinburgh St Leonards	DEFRA	**99.5**	**99.5**	**95.1**	**99.5**	-	**99.5**	**98.6**
Eskdalemuir	DEFRA	-	-	**87.3**	**99.7**	-	-	**93.5**
Fort William	DEFRA	-	-	**90.7**	**94.4**	-	-	**92.6**
Glasgow Centre	DEFRA	99.5	98.2	**99.3**	**99.6**	-	**99.6**	**99.2**
Glasgow City Chambers	DEFRA	99.7	-	99.7	-	-	-	99.7
Glasgow Kerbside	DEFRA	88.6	88.9	87.5	-	-	-	88.3
Grangemouth	Affiliate	**89.4**	**92.9**	**96.4**	-	-	**96.3**	**93.8**
Inverness	DEFRA	99.8	**84.6**	**99.6**	-	-	-	**94.7**
Lerwick	DEFRA	-	-	-	98.8	-	-	98.8
Strath Vaich	DEFRA	-	-	-	**94.1**	-	-	**94.1**
Wales								
Aston Hill	DEFRA	-	-	**20.0**	**95.5**	-	-	**57.7**
Cardiff Centre	DEFRA	**99.7**	**94.1**	**99.5**	**99.7**	-	**98.7**	**98.3**
Cwmbran	Affiliate	**98.4**	**98.4**	**94.3**	**98.5**	-	**65.6**	**91.0**
Narberth	Affiliate	-	93.0	98.5	**94.0**	-	59.1	**86.2**
Port Talbot	Affiliate	-	96.3	95.8	99.7	-	94.2	96.5
Swansea	Affiliate	**93.1**	99.3	94.0	99.2	-	99.2	**97.0**
Wrexham	DEFRA	**98.4**	**90.1**	**94.0**	-	-	**89.8**	**93.1**

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
Number of sites		78	71	111	89	4	76	126
Number of sites < 90%		15	8	23	9	0	15	26
Network Mean (%)		90.7	96.0	91.9	94.0	96.4	93.3	92.3

Shaded boxes are for data capture < 90%
Bold data captures are for critical instruments and sites

Sites and instruments established between 01/04/2006 and 30/06/2006
Bristol St Paul's,DEFRA,CO, NO_2, PM_{10}, O_3, SO_2 15/06/2006
Fort William,DEFRA,O_3, NO_2, 22/06/2006

Table 5.2 shows the ratified data capture statistics for each site for the 6-month period January-June 2006

Table 5.2 Ratified Network data Capture Statistics January to June 2006

Network Data Capture for 01/01/2006 to 30/06/2006 from start date of any new site

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
England								
Barnsley 12	DEFRA	-	-	-	-	-	96.9	96.9
Barnsley Gawber	Affiliate	**97.7**	-	**64.3**	**96.5**	-	97.0	**88.9**
Bath Roadside	Affiliate	68.9	-	98.0	-	-	-	83.4
Billingham	DEFRA	-	-	99.4	-	-	-	99.4
Birmingham Centre	DEFRA	96.8	98.3	94.8	98.1	-	98.3	97.3
Birmingham Tyburn	Affiliate	98.5	93.4	78.6	98.4	-	98.4	93.5
Blackpool Marton	DEFRA	**92.9**	**95.0**	**96.2**	**93.9**	-	**89.1**	**93.4**
Bolton	Affiliate	97.9	98.0	57.7	98.1	-	85.8	87.5
Bottesford	Affiliate	-	-	-	99.6	-	-	99.6
Bournemouth	Affiliate	**97.1**	**97.8**	**94.2**	**98.6**	-	**98.5**	**97.2**
Bradford Centre	DEFRA	93.2	95.2	93.1	90.1	-	91.6	92.6
Brentford Roadside	Affiliate	46.8	-	83.4	-	-	-	65.1
Brighton Preston Park	DEFRA	-	-	**98.2**	**98.0**	-	-	**98.1**
Brighton Roadside	Affiliate	96.5	-	98.7	-	-	-	97.6
Brighton Roadside PM10	Affiliate	-	**99.4**	-	-	-	-	**99.4**
Bristol Old Market	Affiliate	95.4	-	99.1	-	-	-	97.2
Bristol St Paul's	DEFRA	96.6	96.1	92.2	96.4	-	95.1	95.3
Bury Roadside	Affiliate	37.3	91.3	83.0	90.9	-	87.8	78.1
Cambridge Roadside	Affiliate	-	-	92.6	-	-	-	92.6
Camden Kerbside	Affiliate	-	90.3	97.7	-	-	-	94.0
Canterbury	Affiliate	-	**99.0**	98.3	-	-	-	**98.6**
Coventry Memorial Park	DEFRA	**99.5**	**99.6**	**99.5**	**99.4**	-	**91.5**	**97.9**
Exeter	Affiliate	98.1	-	95.6	98.2	-	82.7	93.7

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
Roadside								
Glazebury	DEFRA	-	-	**97.4**	**98.9**	-	-	**98.2**
Great Dun Fell	DEFRA	-	-	-	**99.1**	-	-	**99.1**
Haringey Roadside	Affiliate	-	82.6	93.6	-	-	-	88.1
Harwell	DEFRA	-	97.2	91.9	88.5	97.0	94.9	93.9
High Muffles	DEFRA	-	-	**80.1**	**85.4**	-	-	**82.8**
Hove Roadside	Affiliate	99.4	-	94.3	-	-	**99.4**	**97.7**
Hull Freetown	DEFRA	**94.7**	**98.0**	**78.4**	**98.0**	-	**98.0**	**93.4**
Ladybower	DEFRA	-	-	75.0	95.1	-	95.0	88.4
Leamington Spa	Affiliate	**99.3**	**99.6**	**95.0**	**98.8**	-	**99.3**	**98.4**
Leeds Centre	DEFRA	91.2	98.9	86.0	99.0	-	98.9	94.8
Leicester Centre	DEFRA	**98.0**	**98.0**	**98.0**	**98.3**	-	**98.3**	**98.1**
Leominster	DEFRA	-	-	**91.9**	**95.3**	-	-	**93.6**
Liverpool Speke	Affiliate	**91.6**	**97.7**	**98.0**	**97.8**	-	**96.8**	**96.3**
London A3 Roadside	DEFRA	96.4	98.0	97.4	-	-	-	97.2
London Bexley	Affiliate	98.7	86.3	96.3	97.4	-	98.6	95.5
London Bloomsbury	DEFRA	95.0	96.4	90.8	93.0	96.3	89.8	93.5
London Brent	Affiliate	98.8	98.9	98.0	98.7	-	95.2	97.9
London Bromley	Affiliate	-	-	76.9	-	-	-	76.9
London Cromwell Road 2	DEFRA	97.7	-	85.5	-	-	96.0	93.1
London Eltham	Affiliate	-	98.8	98.9	95.5	-	95.7	97.2
London Hackney	Affiliate	99.2	-	80.5	0.0	-	-	59.9
London Haringey	Affiliate	-	-	-	43.7	-	-	43.7
London Harlington	Affiliate	99.6	99.7	99.1	86.4	-	-	96.2
London Hillingdon	DEFRA	96.4	97.6	95.2	98.1	-	98.2	97.1
London Lewisham	Affiliate	-	-	92.8	99.6	-	96.1	96.2
London Marylebone Road	DEFRA	79.5	97.1	96.2	96.7	97.5	86.9	92.3
London N. Kensington	Affiliate	94.1	99.1	99.2	91.4	-	98.3	96.4
London Southwark	Affiliate	60.2	-	73.9	0.0	-	67.0	50.3
London Teddington	Affiliate	-	-	98.6	98.9	-	98.9	98.8
London Wandsworth	Affiliate	-	-	99.3	99.4	-	-	99.3
London Westminster	DEFRA	27.2	95.6	96.4	96.6	-	83.6	79.9
Lullington Heath	DEFRA	-	-	77.5	80.8	-	68.5	75.6
Manchester Piccadilly	DEFRA	92.4	96.5	97.8	84.4	-	97.7	93.8
Manchester South	Affiliate	-	-	78.6	98.3	-	95.8	90.9
Manchester Town Hall	DEFRA	0.0	-	75.9	-	-	-	38.0

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
Market Harborough	DEFRA	97.6	-	95.1	91.6	-	-	94.8
Middlesbrough	Affiliate	91.3	98.6	96.5	98.7	-	98.6	96.7
Newcastle Centre	DEFRA	**98.2**	**97.5**	**86.3**	**98.0**	-	**98.2**	**95.6**
Northampton	Affiliate	**99.6**	**94.0**	**99.4**	**98.9**	-	**99.5**	**98.3**
Northampton PM10	Affiliate	-	**95.0**	-	-	-	-	**95.0**
Norwich Centre	DEFRA	99.6	86.4	**99.6**	**99.6**	-	99.6	**97.0**
Norwich Forum Roadside	Affiliate	-	-	98.0	-	-	-	98.0
Nottingham Centre	DEFRA	**98.3**	**98.4**	**98.2**	**98.2**	-	**93.0**	**97.2**
Oxford Centre Roadside	Affiliate	**99.2**	-	97.9	-	-	**99.0**	**98.7**
Plymouth Centre	DEFRA	98.3	**79.3**	72.7	98.3	-	90.5	**87.8**
Portsmouth	Affiliate	**98.9**	**99.1**	**99.1**	**99.1**	-	**97.3**	**98.7**
Preston	DEFRA	**96.4**	**98.3**	**92.4**	**92.7**	-	**97.7**	**95.5**
Reading New Town	DEFRA	**98.2**	**94.9**	**64.4**	**94.4**	-	**95.6**	**89.5**
Redcar	Affiliate	95.2	92.4	93.2	92.2	-	90.4	92.7
Rochester	Affiliate	-	87.8	87.4	98.7	98.2	98.4	94.1
Rotherham Centre	Affiliate	-	-	96.9	85.0	-	36.6	72.8
Salford Eccles	Affiliate	98.2	96.2	98.1	98.2	-	97.4	97.6
Sandwell West Bromwich	Affiliate	98.5	-	98.8	98.3	-	98.1	98.4
Scunthorpe Town	Affiliate	-	**97.8**	-	-	-	89.6	**93.7**
Sheffield Centre	DEFRA	98.3	**96.8**	70.5	98.1	-	93.4	**91.4**
Sheffield Tinsley	DEFRA	89.5	-	98.8	-	-	-	94.1
Sibton	DEFRA	-	-	-	**99.6**	-	-	**99.6**
Somerton	Affiliate	-	-	**66.9**	**89.6**	-	-	**78.2**
Southampton Centre	DEFRA	**83.8**	**94.0**	**90.9**	**94.6**	-	**92.2**	**91.1**
Southend-on-Sea	DEFRA	**99.1**	**96.1**	**99.1**	**99.1**	-	**99.1**	**98.5**
Southwark Roadside	Affiliate	21.6	-	28.3	-	-	20.9	23.6
St Osyth	DEFRA	86.0	-	**94.4**	**98.9**	-	-	**93.1**
Stockport Shaw Heath	Affiliate	98.8	98.6	96.5	-	-	98.8	98.2
Stockton-on-Tees Yarm	Affiliate	**98.9**	**98.7**	**98.8**	-	-	-	**98.8**
Stoke-on-Trent Centre	DEFRA	**93.2**	**95.7**	**90.0**	**93.6**	-	**94.5**	**93.4**
Sunderland	DEFRA	-	-	-	-	-	**97.0**	**97.0**
Sunderland Silksworth	Affiliate	-	-	**96.5**	**91.4**	-	-	**94.0**
Thurrock	Affiliate	98.8	98.5	**94.5**	**98.9**	-	98.8	**97.9**
Tower Hamlets Roadside	Affiliate	88.0	-	99.6	-	-	-	93.8
Walsall Alumwell	DEFRA	-	-	98.0	-	-	-	98.0
Walsall Willenhall	Affiliate	-	-	83.5	-	-	-	83.5
West London	DEFRA	71.7	-	94.6	-	-	-	83.2

Site	Owner	CO	PM_{10}	NO_2	O_3	PM_{25}	SO_2	Site Average
Weybourne	Affiliate	-	-	-	77.6	-	-	77.6
Wicken Fen	DEFRA	-	-	**95.9**	**79.7**	-	88.7	**88.1**
Wigan Centre	Affiliate	**97.6**	**97.4**	**98.6**	**97.1**	-	**94.8**	**97.1**
Wirral Tranmere	DEFRA	**96.6**	**95.9**	**94.8**	**92.8**	-	**74.2**	**90.9**
Wolverhampton Centre	DEFRA	93.3	97.4	96.8	97.3	-	97.3	96.4
Yarner Wood	DEFRA	-	-	**94.2**	**99.0**	-	-	**96.6**
N Ireland								
Belfast Centre	DEFRA	**76.3**	96.2	**92.1**	**96.0**	-	94.4	**91.0**
Belfast Clara St	Affiliate	-	99.2	-	-	-	-	99.2
Belfast East	DEFRA	-	-	-	-	-	98.6	98.6
Derry	Affiliate	**93.8**	**97.1**	**81.8**	**68.4**	-	**90.4**	**86.3**
Lough Navar	DEFRA	-	98.2	-	**98.3**	-	-	**98.3**
Scotland								
Aberdeen	Affiliate	**99.3**	**91.1**	**97.3**	**99.3**	-	**98.9**	**97.2**
Bush Estate	DEFRA	-	-	**88.2**	**97.3**	-	-	**92.8**
Dumfries	DEFRA	**97.0**	**89.5**	**92.6**	-	-	-	**93.0**
Edinburgh St Leonards	DEFRA	**98.8**	**98.8**	**93.4**	**98.5**	-	**98.8**	**97.7**
Eskdalemuir	DEFRA	-	-	**89.9**	**98.9**	-	-	**94.4**
Fort William	DEFRA	-	-	**90.7**	**94.4**	-	-	**92.6**
Glasgow Centre	DEFRA	98.2	89.9	**98.1**	**98.3**	-	**98.3**	**96.5**
Glasgow City Chambers	DEFRA	98.9	-	97.8	-	-	-	98.3
Glasgow Kerbside	DEFRA	93.3	85.0	92.6	-	-	-	90.3
Grangemouth	Affiliate	**94.3**	**95.3**	**97.7**	-	-	**97.8**	**96.3**
Inverness	DEFRA	99.1	**85.1**	**99.0**	-	-	-	**94.4**
Lerwick	DEFRA	-	-	-	98.7	-	-	98.7
Strath Vaich	DEFRA	-	-	-	**95.9**	-	-	**95.9**
Wales								
Aston Hill	DEFRA	-	-	**55.3**	**88.8**	-	-	**72.1**
Cardiff Centre	DEFRA	**98.4**	**95.5**	**95.8**	**97.9**	-	**97.8**	**97.1**
Cwmbran	Affiliate	**98.8**	**98.3**	**91.4**	**99.1**	-	**82.5**	**94.0**
Narberth	Affiliate	-	94.4	97.2	**93.0**	-	75.1	**89.9**
Port Talbot	Affiliate	-	89.6	96.3	98.3	-	95.5	94.9
Swansea	Affiliate	**88.7**	97.1	94.1	96.9	-	88.5	**93.1**
Wrexham	DEFRA	**98.4**	**93.9**	**94.0**	-	-	**93.9**	**95.0**
Number of sites		78	71	111	89	4	76	126
Number of sites < 90%		15	10	29	14	0	17	27
Network Mean (%)		90.2	95.3	90.9	92.5	97.3	92.1	91.4

Table 5.3 shows the ratified AURN data capture for the 61 operational **critical sites** in the network for the 6-month period January to June 2006. Sites with less than 90% data capture are shaded. This table contains the overall data capture for 6 months, regardless of when sites started or finished monitoring. A total of 9 critical sites had a data capture of less than 90%.

Table 5.3 AURN Ratified Data Capture (%) for CRITICAL SITES January to June 2006

Network Data Capture for 01/01/2006 to 30/06/2006 from start date of any new site

Site	Owner	CO	PM_{10}	NO_2	O_3	SO_2	Site Average
England							
Barnsley Gawber	Affiliate	**97.7**	-	**64.3**	**96.5**	97.0	**88.9**
Blackpool Marton	DEFRA	**92.9**	**95.0**	**96.2**	**93.9**	**89.1**	**93.4**
Bournemouth	Affiliate	**97.1**	**97.8**	**94.2**	**98.6**	**98.5**	**97.2**
Brighton Preston Park	DEFRA	-	-	**98.2**	**98.0**	-	**98.1**
Brighton Roadside PM10	Affiliate	-	**99.4**	-	-	-	**99.4**
Canterbury	Affiliate	-	**99.0**	98.3	-	-	**98.6**
Coventry Memorial Park	DEFRA	**99.5**	**99.6**	**99.5**	**99.4**	**91.5**	**97.9**
Glazebury	DEFRA	-	-	**97.4**	**98.9**	-	**98.2**
Great Dun Fell	DEFRA	-	-	-	**99.1**	-	**99.1**
High Muffles	DEFRA	-	-	**80.1**	**85.4**	-	**82.8**
Hove Roadside	Affiliate	99.4	-	94.3	-	**99.4**	**97.7**
Hull Freetown	DEFRA	**94.7**	**98.0**	**78.4**	**98.0**	**98.0**	**93.4**
Leamington Spa	Affiliate	**99.3**	**99.6**	**95.0**	**98.8**	**99.3**	**98.4**
Leicester Centre	DEFRA	**98.0**	**98.0**	**98.0**	**98.3**	**98.3**	**98.1**
Leominster	DEFRA	-	-	**91.9**	**95.3**	-	**93.6**
Liverpool Speke	Affiliate	**91.6**	**97.7**	**98.0**	**97.8**	**96.8**	**96.3**
Newcastle Centre	DEFRA	**98.2**	**97.5**	**86.3**	**98.0**	**98.2**	**95.6**
Northampton	Affiliate	**99.6**	**94.0**	**99.4**	**98.9**	**99.5**	**98.3**
Northampton PM10	Affiliate	-	**95.0**	-	-	-	**95.0**
Norwich Centre	DEFRA	99.6	86.4	**99.6**	**99.6**	99.6	**97.0**
Nottingham Centre	DEFRA	**98.3**	**98.4**	**98.2**	**98.2**	**93.0**	**97.2**
Oxford Centre Roadside	Affiliate	**99.2**	-	97.9	-	**99.0**	**98.7**
Plymouth Centre	DEFRA	98.3	**79.3**	72.7	98.3	90.5	**87.8**
Portsmouth	Affiliate	**98.9**	**99.1**	**99.1**	**99.1**	**97.3**	**98.7**
Preston	DEFRA	**96.4**	**98.3**	**92.4**	**92.7**	**97.7**	**95.5**
Reading New Town	DEFRA	**98.2**	**94.9**	**64.4**	**94.4**	**95.6**	**89.5**
Scunthorpe Town	Affiliate	-	**97.8**	-	-	89.6	**93.7**
Sheffield Centre	DEFRA	98.3	**96.8**	70.5	98.1	93.4	**91.4**
Sibton	DEFRA	-	-	-	**99.6**	-	**99.6**
Somerton	Affiliate	-	-	**66.9**	**89.6**	-	**78.2**
Southampton Centre	DEFRA	**83.8**	**94.0**	**90.9**	**94.6**	**92.2**	**91.1**
Southend-on-Sea	DEFRA	**99.1**	**96.1**	**99.1**	**99.1**	**99.1**	**98.5**
St Osyth	DEFRA	86.0	-	**94.4**	**98.9**	-	**93.1**
Stockton-on-	Affiliate	**98.9**	**98.7**	**98.8**	-	-	**98.8**

Site	Owner	CO	PM_{10}	NO_2	O_3	SO_2	Site Average
Tees Yarm							
Stoke-on-Trent Centre	DEFRA	**93.2**	**95.7**	**90.0**	**93.6**	**94.5**	**93.4**
Sunderland	DEFRA	-	-	-	-	**97.0**	**97.0**
Sunderland Silksworth	Affiliate	-	-	**96.5**	**91.4**	-	**94.0**
Thurrock	Affiliate	98.8	98.5	**94.5**	**98.9**	98.8	**97.9**
Wicken Fen	DEFRA	-	-	**95.9**	**79.7**	88.7	**88.1**
Wigan Centre	Affiliate	**97.6**	**97.4**	**98.6**	**97.1**	**94.8**	**97.1**
Wirral Tranmere	DEFRA	**96.6**	**95.9**	**94.8**	**92.8**	**74.2**	**90.9**
Yarner Wood	DEFRA	-	-	**94.2**	**99.0**	-	**96.6**
N Ireland							
Belfast Centre	DEFRA	**76.3**	96.2	**92.1**	**96.0**	94.4	**91.0**
Derry	Affiliate	**93.8**	**97.1**	**81.8**	**68.4**	**90.4**	**86.3**
Lough Navar	DEFRA	-	98.2	-	**98.3**	-	**98.3**
Scotland							
Aberdeen	Affiliate	**99.3**	**91.1**	**97.3**	**99.3**	**98.9**	**97.2**
Bush Estate	DEFRA	-	-	**88.2**	**97.3**	-	**92.8**
Dumfries	DEFRA	**97.0**	**89.5**	**92.6**	-	-	**93.0**
Edinburgh St Leonards	DEFRA	**98.8**	**98.8**	**93.4**	**98.5**	**98.8**	**97.7**
Eskdalemuir	DEFRA	-	-	**89.9**	**98.9**	-	**94.4**
Fort William	DEFRA	-	-	**90.7**	**94.4**	-	**92.6**
Glasgow Centre	DEFRA	98.2	89.9	**98.1**	**98.3**	**98.3**	**96.5**
Grangemouth	Affiliate	**94.3**	**95.4**	**97.7**	-	**97.8**	**96.3**
Inverness	DEFRA	99.1	**85.1**	**99.0**	-	-	**94.4**
Strath Vaich	DEFRA	-	-	-	**95.9**	-	**95.9**
Wales							
Aston Hill	DEFRA	-	-	**55.3**	**88.8**	-	**72.1**
Cardiff Centre	DEFRA	**98.4**	**95.5**	**95.8**	**97.9**	**97.8**	**97.1**
Cwmbran	Affiliate	**98.8**	**98.3**	**91.4**	**99.1**	**82.5**	**94.0**
Narberth	Affiliate	-	94.4	97.2	**93.0**	75.1	**89.9**
Swansea	Affiliate	**88.7**	97.1	94.1	96.9	88.5	**93.1**
Wrexham	DEFRA	**98.4**	**93.9**	**94.0**	-	**93.9**	**95.0**
Number of sites		39	41	53	49	39	61
Number of sites < 90%		4	5	13	5	7	9

Shaded boxes are for data capture < 90%
Bold data captures are for critical instruments and sites

RECOMMENDATION
Every effort should be made to ensure that data capture is maximised for the critical sites. LSOs and ESUs should undertake call-outs and repairs as soon as possible to avoid unnecessary data loss at these sites.

Appendix A1

As requested by the Department, QA/QC Unit has provided a list of suggestions for equipment that may need replacing or upgrading in the network. The following provides a summary of the outstanding issues to date since January 2004. Recommendations have been prioritised as follows:

Priority	Definition	Time-scale
High*	Immediate action necessary to avoid compromising data capture/quality or safety. Critical sites should be treated as high priority.	Within 2 weeks
Medium	Essential but not immediate	3-6 months
Low	Desirable but not essential	As appropriate

*Note – QA/QC Unit's practice is to notify CMCU immediately of any high priority issues at the time of the event.

	Recommendations October 2006	Priority	Action
20	The noisy analysers at Bolton (NOx) and London Westminster (CO) should be repaired or replaced at the earliest opportunity	High	ESUs to repair or replace as appropriate
	Recommendations July 2006	**Priority**	**Action**
19	Weybourne O3 analyser should be upgraded to allow monthly LSO calibrations and daily autocalibrations	Medium	ESU to provide CMCU with quotation for necessary work
	Recommendations April 2006		
	None		
	Recommendations January 2006		
17	The performance of CO analysers needs close attention by all parties, and poorly performing analysers replaced or upgraded	High	LSOs and CMCU to check performance carefully; ESU's to action repairs promptly
	Recommendations July 2005		
14	Several analysers still exhibit poor performance-	High	Repair/replace ment to be actioned by ESUs
13	Continuing problems with some autocal run-ons causing loss of up to 2 hours per day	High	Many sites now cured, but some need attention at next ESU visit
	Recommendations May 2005		
10	The SO_2 analyser at Manchester South has shown a history of high noise response and should be up-graded or repaired.	Medium	Analyser performance still poor

APPENDIX A2

CRITICAL SITES IN THE AURN (July 2006)

Table A1 Critical Sites in Agglomerations

Site Name	Agglomeration	Critical Pollutants		
		DD1	DD2[7]	DD3
Belfast Centre	Belfast Urban Area	NO_2	CO	NO_2 O_3
Blackpool Marton	Blackpool Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Bournemouth+	Bournemouth Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Brighton Preston Park	Brighton/Worthing/Littlehampton			NO_2 O_3
Brighton Roadside PM_{10}	Brighton/Worthing/Littlehampton	PM_{10}		
Bristol St Pauls	Bristol Urban Area	PM_{10} SO_2		NO_2 O_3
Cardiff Centre	Cardiff Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Coventry Memorial Park+	Coventry/Bedworth	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Edinburgh St Leonards	Edinburgh Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Glasgow Centre	Glasgow Urban Area	SO_2		NO_2 O_3
Hove Roadside+	Brighton/Worthing/Littlehampton	SO_2		
Hull Freetown	Kingston upon Hull	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Leicester Centre	Leicester Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Liverpool Speke	Liverpool Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Newcastle Centre	Tyneside	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Nottingham Centre	Nottingham Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Portsmouth+	Portsmouth Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Preston	Preston Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Reading New Town	Reading/Wokingham Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Sheffield Centre	Sheffield Urban Area	PM_{10}		
Southampton Centre	Southampton Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Southend-on-Sea	Southend Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Stoke-on-Trent Centre	The Potteries	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Swansea+	Swansea Urban Area		CO	
Wirral Tranmere	Birkenhead Urban Area	NO_2 PM_{10} SO_2	CO	NO_2 O_3

"+ indicates Affiliate site"

Note 7: Addresses CO, Benzene not included here

Table A2 Critical Sites in Zones

Site Name	Zone	Critical Pollutant		
		DD1	DD2[7]	DD3
Aberdeen+	North East Scotland	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Aston Hill	North Wales			NO_2 O_3
Barnsley Gawber+	Yorkshire & Humberside	NO_2	CO	NO_2 O_3
Bush Estate	Central Scotland			NO_2 O_3
Canterbury+	South East	PM_{10}		
Cwmbran+	South Wales	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Derry+	Northern Ireland	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Dumfries	Scottish Borders	NO_2 PM_{10}	CO	
Eskdalemuir	Scottish Borders			NO_2 O_3
Fort William	Highland			NO_2 O_3
Glazebury	North West & Merseyside			NO_2 O_3
Grangemouth+	Central Scotland	NO_2 PM_{10} SO_2	CO	
Great Dun Fell	North West & Merseyside			O_3[3]
High Muffles	Yorkshire & Humberside			NO_2 O_3
Inverness	Highland	NO_2 PM_{10}		
Leamington Spa+	West Midlands	PM_{10} SO_2	CO	NO_2 O_3
Leominster	West Midlands			NO_2[4] O_3
Lough Navar	Northern Ireland			O_3[3]
Narberth	South Wales			O_3[3]
Northampton+	East Midlands	NO_2 PM_{10}[2] SO_2	CO	NO_2 O_3
Norwich Centre	Eastern			NO_2 O_3
Oxford Centre Roadside+	South East	SO_2	CO	
Plymouth Centre	South West	PM_{10}		
Scunthorpe Town+	Yorkshire & Humberside	PM_{10}		
Sibton	Eastern			O_3[3]
Somerton	South West			NO_2 O_3
St Osyth	Eastern			NO_2 O_3
Stockton-on-Tees Yarm+	North East	NO_2 PM_{10}	CO	
Strath Vaich	Highland			O_3[3]
Sunderland	North East	SO_2		
Sunderland Silkworth+	North East			NO_2 O_3
Thurrock	Eastern			NO_2 O_3
Wicken Fen	Eastern			NO_2 O_3
Wigan Centre+	North West & Merseyside	NO_2 PM_{10} SO_2	CO	NO_2 O_3
Wrexham	North Wales	NO_2 PM_{10} SO_2	CO	
Yarner Wood	South West			NO_2 O_3

Total of 61 Critical Sites (25 in Agglomerations and 36 in Zones)
51% of network stations critical under one or more Daughter Directives
"+ indicates Affiliate site"

Note 2: PM_{10} monitored by Gravimetric and TEOM
Note 3: DD3 Critical as Rural Background station
Note 7: Addresses CO, Benzene not included here

APPENDIX A3

Inventory of Defra owned Equipment

An up-to-date inventory of Department-owned equipment used by the QA/QC Unit is provided below:

QA/QC Unit's inventory of Department-owned equipment, August 2006

Computer software	The HIS (Heuristic Information System) software suite used for all data management. A few specific capabilities of HIS were developed in order to meet specific Department deliverables or requirements (examples include software for annual report analysis/compilation, for formatting/transmitting network data to archive or DDU and for reporting Directive compliance data to the EC).
Field support equipment	Field support equipment: 1 intercalibration equipment set (includes mass flow controllers and read-out unit) A second intercalibration (commissioned January 2001) UV photometers: API model M401 s/n 123- purchased April 1999 (on temporary loan to Siemens) API model 401 s/n 151 - purchased October 2000 API model 401 s/n 176 – purchased December 2002 (on temporary loan to Horiba) API model 401 s/n 290 – purchased May 2004 API model 401 s/n 291 – purchased May 2004 API model 401 s/n 292 purchased May 2004 API model 401 s/n 293 purchased May 2004 Mass flow controllers - purchased April 2002 (incorporated into existing audit dilution apparatus) 3 Drycal flow meters - purchased September 2002 1 Mass flow controller read-out unit to be incorporated in the audit dilution apparatus – purchased September 2002. A third intercalibration kit (commissioned May 2004) Drycal flow meter – purchased March 2004 Sabio 2010 dilution calibrator – purchased February 2005 Sabio 2020 zero air generator – purchased February 2005 Sabio 2030 ozone photometer – purchased February 2005 Sabio 2010 dilution calibrator – purchased June 2006 Sabio 2020 zero air generator – purchased June 2006 Sabio 2030 ozone photometer – purchased June 2006
Zero air pumps	6 spare zero air pumps for routine maintenance/repair of zero air generators in the AURN.
Analysers	AC31 dual chamber NO_x analyser TEI 43C SO_2 analyser TEI 48C CO analyser M265 chemiluminescent ozone analyser (All of the above purchased on behalf of Defra by Casella Stanger in March 2003 and transferred to QA/QC Unit)

APPENDIX A4

Summary of Recommendations

This appendix provides a summary of all the recommendations given in this report.

	Need	Recommendation	Section	FAO
1	Improve data capture at critical sites	LSOs and ESUs should undertake call-outs as soon as possible at these sites	2.2 +5	LSOs and ESUs
2	Autocalibration run-on	Investigate problem of autocalibration run on at sites given in Table 2.5. Eskdalemuir and Leominster should be prioritised as 2 hours per day are being lost at these sites. Autocalibration span concentrations to be <200ppb for urban sites and <100ppb for rural sites.	2.4	ESUs
3	Bolton NOx	The noisy analyser should be repaired or replaced as soon as possible	3.2	ESU
4	London Westminster CO	The noisy analyser should be repaired or replaced as soon as possible	3.3	ESU
5	Poor performance of analysers-see Section 3.6	QA/QC Unit would like to seek clarification from the Equipment Support Unit/manufacturer as to the current situation regarding the reason for the problems and what plans are in place to resolve them. We recommend that immediate attention is given to this issue as the majority of these instruments are located at critical sites.	3.6	ESU