



Ricardo
Energy & Environment

QAQC Report for the Automatic Urban and Rural Network, April-June 2015

Report for Defra and the Devolved Administrations
Defra contract number 21316

Customer:**Defra and the Devolved Administrations****Customer reference:**

21316

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04 December 2015

Ricardo Energy & Environment reference:

Ref: ED60071201_2015Q2- Issue 1

Executive summary

Ricardo Energy & Environment carries out the quality assurance and quality 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), the Scottish Government, Welsh Government and Department of Environment (DoE) in Northern Ireland.

Ratified hourly average data capture for the network averaged 92.6% for all pollutants (O₃, NO₂, SO₂, CO, PM₁₀ and PM_{2.5}) during the 3-month reporting period April – June 2015. Average data capture for all pollutants were above 85%. There were 25 stations with data capture less than 85% for the period (33 below 90%).

A total of 152 monitoring stations in the AURN operated during this quarter, of which 75 were Local Authority owned stations affiliated to the national network. Some are co-located and separately named gravimetric particulate analysers at stations with automatic analysers. Many affiliated stations have additional Defra-funded analysers installed on site.

During this quarter, the spring 2015 ozone intercalibration exercise was carried out, involving comprehensive performance tests on every ozone analyser in the network. This allows the accuracy of the measured results to be determined, and a measurement uncertainty for each analyser to be determined, as required by the Data Quality Objective.

The data from each analyser in the network have been ratified by the QA/QC Unit using documented and validated methods. This process takes into account input from Local Site Operator (LSO) calibrations, the QA/QC audits and records from Equipment Support Unit (ESU) activity. Principal reasons for data loss are given here for stations which fail to make the 85% data capture target for the quarter.

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1 Introduction

1.1 Background

The UK Automatic Urban and Rural Network (AURN) has been established to provide information on air quality concentrations throughout the UK for a range of pollutants. The primary function of the AURN is to provide data in compliance with EU Directives on Air Quality. However, in addition, the data and information from the AURN is required by scientists, policy makers and planners to enable them to make informed decisions on managing and improving air quality for the benefit of health and the natural environment.

A number of organisations are involved in the day-to-day running of the network. Currently, the role of Central Management and Co-ordination Unit (CMCU) for the AURN is contracted to Bureau Veritas, whilst the Environmental Research Group (ERG) of King's College London has been appointed as Management Unit for the AURN monitoring stations that are also part of the London Air Quality Network (LAQN). Ricardo Energy & Environment undertakes the role of Quality Assurance and Control Unit (QA/QC Unit) for stations within the AURN. The responsibility for operating individual monitoring stations is assigned to local organisations with relevant experience in the field under the direct management (and contract to) CMCU. Calibration gases for the network are supplied by Air Liquide Ltd and are provided with an ISO17025 certificate of calibration by Ricardo Energy & Environment. The monitoring equipment is serviced and maintained by a number of Equipment Support Units, under contract to the CMCU or the station owner in the case of affiliated stations.

Dissemination of the data from the AURN via UK-AIR (the UK online Air Information Resource, <http://uk-air.defra.gov.uk/>) and other media such social media and freephone services is undertaken by the Data Dissemination Unit (DDU). A summary report of the data is also published annually in the "Air Pollution in the UK" series of reports.

A total of 152 monitoring stations in the AURN operated during this quarter. Some of these are co-located and separately-named gravimetric particulate analysers at stations with automatic analysers. Many affiliated stations have additional Defra-funded analysers installed on station.

The main reasons for data loss at the stations have been provided. These were predominantly due to instrument or air conditioning faults, response instability or problems associated with the replacement of analysers and infrastructure.

1.2 What this report covers

This report covers the three-month period April-June 2015, or "Quarter 2" of the year. This report covers the main QA/QC activities; the relevant CMCU reports should be consulted for more detail on station operational issues.

1.3 Where to Find More Information

Further information on the AURN can be found in the following:

- The AURN Hub. This online resource for AURN stakeholders contains network-specific information relating to the AURN, including the LSO Manual, QA/QC audit and ESU service schedules, CMCU reports and supporting information.
- UK-AIR, www.uk-air.defra.gov which contains information on individual stations along with real-time hourly data, graphs and statistics.

1.4 Changes to the Network during this Quarter

The following changes were made to the network during the period April-June 2015:

Table 1.1 New Stations Commissioned April-June 2015

Station	Pollutants	Date commissioned
Bradford Mayo Avenue	NO ₂	24 April 2015
Doncaster A630 Cleveland Street	NO ₂	7 May 2015
Leicester A594 Roadside	NO ₂ PM ₁₀	1 May 2015
Stoke on Trent A50 Roadside	NO ₂ PM ₁₀	22 May 2015

2 Methodology

The QA/QC activities consist of the following key parts:

- QA/QC audits of all analysers in the network every six months (three months for ozone)
- Ratification of the data on a three-monthly basis, and upload ratified data to the Data Dissemination Unit
- Assessment of new station locations in conjunction with the CMCU, and assessment of compliance with the siting criteria in the Directive.

2.1 Spring Intercalibration, April 2015

2.1.1 Overview of Spring Intercalibration

The QA/QC activities consist of the following key parts:

- QA/QC audits of all ozone analysers in the network
- Ratification of the data on a three-monthly basis, and upload ratified data to the Data Dissemination Unit
- Assessment of new station locations in conjunction with the CMCU, and assessment of compliance with the siting criteria in the Directive
- Investigation of instances of suspected poor quality data

2.1.2 Methodology for FDMS Baseline Checks

As part of the QA/QC remit for continuous improvement, an ad hoc study of particulate matter (PM) analyser baseline response has been undertaken for the past two years. This study has been coordinated following investigations of issues identified both by CMCU during routine operation and by QA/QC unit during the ratification process.

The study initially concentrated on FDMS analysers, examining the baseline profile of the reference channels and the relationship with other neighbouring monitoring stations. It has become clear that, on a daily mean basis, regional reference PM concentrations regularly reach a minimum value that approaches $0 \mu\text{g m}^{-3}$. The test is equally valid for BAM instruments, and thus the tests are also carried out on these.

2.2 Overview of Data Ratification

Data for each station are supplied monthly by the CMCUs. Once initial monthly data files have been received, checked and loaded into MODUS, the process of data ratification begins. This process is required to refine data scaling based on all the calibration and audit data available, and to identify, withdraw or flag anomalous data due to instrument or sampling faults or where data fall outside the Uncertainties or Limits of Detection defined by the Data Quality Objectives (DQOs) of Directive 2008/50/EC (the Air Quality Directive) and the European Union's Implementing Provisions for Reporting.

3 Intercalibration Results

3.1 National Network Overview

During April 2015, Ricardo Energy & Environment undertook an intercalibration of 79 ozone monitoring stations in operation in the Defra and the Devolved Administrations Automatic Urban and Rural Monitoring Network. These calibrations constitute the ISO17025 traceable calibration required every three months by the DQO. The intercalibration exercise is a vital step in the process of data ratification. The audits are used to undertake a number of analyser and infrastructure performance checks that cannot be performed by Local Station Operators, with a view to ensuring confidence in the accuracy, consistency and traceability of air pollution measurements made at all the monitoring stations.

3.2 Certification

The Network Certificate of Calibration is available on the AURN Hub. This certificate presents the results of the individual analyser scaling factors on the day of the audit, as calculated by Ricardo Energy & Environment using the audit cylinder standards, in accordance with our ISO17025 accreditation.

4 Data Ratification Results

4.1 Data Capture – Network Overview

4.1.1 Overall Data Capture

The overall data capture for the period April-June 2015 is given in Table 4.1. The data capture target of the Air Quality Directive is 90% excluding periods of planned maintenance (e.g. calibrations, audits and servicing). An allowance of 5% is made for this, hence the target of 85% also shown in the table.

Table 4.1 Data Capture Summary, April-June 2015

Name	CO	PM ₁₀	PM _{2.5}	NO ₂	O ₃	SO ₂	All
Number of stations	7	71	80	131	79	29	152
Number of stations < 85 %	0	20	11	14	6	4	25
Number of stations < 90%	0	21	12	16	9	4	33
Network mean	96.68	83.77	91.61	94.23	94.76	90.19	92.60

4.1.2 Generic Data Quality Issues

During the ratification of the Q1 data (as reported in the 2015 Q1 report) it was noticed that for two stations, Cambridge Roadside and Exeter Roadside, that the stated times of audits and calibrations did not exactly match the gaps in the data received from CMCU. On investigation, both stations were found to have external data loggers rather than on-board logging of data, and the clock time for the logger was incorrect, around one hour for Cambridge and 2½ hours for Exeter. The QA/QC unit have corrected the time stamps on these datasets, and the data reported as ratified (following some delay). It is noted that at Horiba-equipped stations (such as Exeter Roadside), the QA/QC unit is not able to see the logger clock (there is no display) and it is strongly recommended that the CMCU provide evidence to the QA/QC unit that these stations are within the maximum expected 15-minute error. This issue has been highlighted in the AURN Summer 2015 Newsletter.

4.2 Data Capture and Station-Specific Issues - England (Excluding Greater London)

A summary of data capture for England for April-June 2015 is given in Table 4.2:

Table 4.2 Data Capture for England, April-June 2015

Name	CO	PM ₁₀	PM _{2.5}	NO ₂	O ₃	SO ₂	Average
Barnsley Gawber				95.56	96.52	99.45	97.18
Barnstaple A39		88.55	99.82				94.18
Bath Roadside				99.77			99.77
Billingham				99.77			99.77
Birmingham Acocks Green			99.91	99.73	71.34		90.32
Birmingham Tyburn		27.38	27.34	99.77	99.82	99.59	70.78

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Birmingham Tyburn Roadside		99.08	97.30	98.40	99.86		98.66
Blackburn Accrington Road				99.86			99.86
Blackpool Marton			98.12	95.70	99.63		97.82
Bottesford					99.59		99.59
Bournemouth			100.00	99.82	99.95		99.92
Bradford Mayo Avenue				98.65			98.65
Brighton Preston Park			100.00	98.31	99.36		99.22
Bristol St Paul's		98.31	98.35	77.98	99.91		93.64
Bury Whitefield Roadside		93.86		92.54			93.20
Cambridge Roadside				97.53			97.53
Canterbury				99.73	70.83		85.28
Carlisle Roadside		98.90	99.13	97.71			98.58
Charlton Mackrell				99.04	99.77		99.40
Chatham Centre Roadside		99.08	99.54	99.77			99.47
Chesterfield Loundsley Green		90.75	32.55	99.95			74.42
Chesterfield Roadside		99.40	99.40	98.08			98.96
Coventry Allesley			99.82	99.54	98.86		99.40
Doncaster A630 Cleveland Street				98.64			98.64
Eastbourne		53.85	78.02	99.40			77.09
Exeter Roadside				99.50	88.97		94.23
Glazebury				86.68	94.64		90.66
Great Dun Fell					48.12		48.12
Harwell		97.99	97.94	93.41	98.58	94.32	96.45
Harwell		97.80	96.70				97.25
High Muffles				94.60	95.01		94.80
Honiton				99.50			99.50
Horley				98.58			98.58
Hull Freetown			98.35	98.35	99.18	99.82	98.92
Hull Holderness Road		91.35		99.91			95.63
Ladybower				99.73	99.86	99.40	99.66

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Leamington Spa		100.00	99.91	99.91	99.86		99.92
Leamington Spa Rugby Road		99.73	98.86	99.91			99.50
Leeds Centre	99.86	0.00	99.95	99.73	99.77	99.82	83.19
Leeds Headingley Kerbside		98.53	99.59	99.77			99.30
Leicester A594 Roadside				99.68			99.68
Leicester University			100.00	99.82	99.91		99.91
Leominster				96.98	97.94		97.46
Lincoln Canwick Road				98.49			98.49
Liverpool Queen's Drive Roadside				93.91			93.91
Liverpool Speke		99.50	100.00	96.98	99.77	99.95	99.24
Lullington Heath				51.97	97.66	95.74	81.79
Luton A505 Roadside				99.54			99.54
Manchester Piccadilly			100.00	99.63	99.77	99.59	99.75
Manchester South				99.77	99.91		99.84
Market Harborough				94.23	98.21		96.22
Middlesbrough		99.27	98.49	99.36	99.59	98.31	99.00
Newcastle Centre		0.00	1.10	99.54	99.27		49.98
Newcastle Cradlewell Roadside				77.98			77.98
Northampton Kingsthorpe			100.00	93.22	93.09		95.44
Norwich Lakenfields		99.95	99.86	98.86	99.91		99.65
Nottingham Centre		78.25	77.06	84.62	90.38	97.21	85.50
Oldbury Birmingham Road				95.70			95.70
Oxford Centre Roadside				99.86			99.86
Oxford St Ebbes		99.86	99.63	95.38			98.29
Plymouth Centre		96.20	87.04	99.63	99.95		95.71
Portsmouth		75.09	83.29	98.31	99.91		89.15
Preston			100.00	99.82	99.82		99.88
Reading New Town		98.81	99.27	92.86	96.15		96.77
Rochester Stoke		99.50	99.45	99.82	99.91	60.94	91.92

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Salford Eccles		99.36	98.40	98.31			98.69
Saltash Callington Road		74.08	99.95				87.02
Sandy Roadside		66.71	96.84	99.82			87.79
Scunthorpe Town		93.27		83.20		78.34	84.94
Shaw Crompton Way				97.71			97.71
Sheffield Devonshire Green		0.00	30.13	29.81	29.58		22.38
Sheffield Tinsley				99.59			99.59
Sibton					99.91		99.91
Southampton Centre		99.27	99.95	99.86	99.68	99.22	99.60
Southend-on-Sea			96.29	96.70	96.70		96.57
St Osyth				94.92	99.27		97.09
Stanford-le-Hope Roadside		98.67	97.62	98.12			98.14
Stockton on Tees A1035 Roadside				99.86			99.86
Stockton-on-Tees Eaglescliffe		98.90	99.68	99.95			99.51
Stoke on Trent A50 Roadside		100.00		99.90			99.95
Stoke-on-Trent Centre			99.31	95.97	98.44		97.91
Storrington Roadside		74.04	74.22	49.08			65.78
Sunderland Silksworth			92.35	70.56	94.83		85.91
Sunderland Wessington Way				83.93			83.93
Thurrock		99.86		98.72	98.86	98.40	98.96
Walsall Woodlands				99.82	80.45		90.13
Warrington		99.63	99.54	97.02			98.73
Weybourne					99.91		99.91
Wicken Fen				98.17	99.73	0.00	65.96
Widnes Milton Road				98.72			98.72
Wigan Centre			99.13	91.99	99.63		96.92
Wirral Tranmere			99.77	87.77	87.77		91.77
Yarner Wood				99.54	99.63		99.59
York Bootham		99.36	98.81				99.08

Name	CO	PM ₁₀	PM _{2.5}	NO ₂	O ₃	SO ₂	Average
York Fishergate		99.18	84.25	99.45			94.29
Number of Sites	1	41	51	87	52	16	95
Number of sites < 85 %	0	10	9	9	5	3	13
Number of sites < 90%	0	11	10	11	7	3	19
Network mean	99.86	84.96	90.82	94.82	94.52	88.76	92.99

Eastbourne

The PM_{2.5} FDMS analyser became unresponsive on 13 January. Despite several attempts at repair, data quality did not improve, and data up to 12 April have been deleted. The PM₁₀ volatile concentrations became a regional outlier in early March; data from 1 April-12 May have been deleted.

Newcastle Centre

The baselines for both PM_{2.5} and PM₁₀ were above the acceptance limit at the summer audit; PM_{2.5} data have been deleted from 2 April and PM₁₀ from 26 March up to the end of June. More data will be lost in Q3.

Newcastle Cradlewell Roadside

The station has been without an ESU contractor from autumn 2014. A faulty pressure transducer and a disconnected pump lead resulted in the loss of some data this quarter.

Nottingham Centre

The PM₁₀ FDMS had a controller fault during the period 1-20 April. The PM_{2.5} data were identified as a regional outlier from 13-30 June; it is likely that more data will be lost from Q3, as this problem extended beyond the end of June. The NO_x analyser developed a detector fault on 12 June, a hotspare was installed but six days data were lost.

Portsmouth

Both FDMS analysers suffered from high noise levels this quarter, possibly due to leaks inside both units. Some data have been deleted during ratification.

Saltash Callington Road

The PM₁₀ concentrations were identified as regional outliers on a number of occasions, and together with a marginal baseline measurement, resulted in the deletion of some periods of data this quarter.

Sandy Roadside

The PM₁₀ data continued to be of intermittent poor quality during the quarter, probably as a result of air conditioning problems.

Scunthorpe Town

The station instruments were relocated into a new enclosure adjacent to the old one in late June; the move resulted in the loss of some data from all instruments.

Sheffield Devonshire Green

The station was out of operation from 9 March, when the sample inlets were damaged through vandalism. Repairs were completed in early June. The PM₁₀ FDMS gave a high baseline at the summer audit, and all data from the quarter have been deleted.

Storrington Roadside

The air conditioning system failed in June, and the station was turned off to prevent damage.

Sunderland Silksworth

There were gaps for 1-17 April and 20-26 April in the NO_x dataset sent by the CMCU. This was attributed to comms problems at the site.

Sunderland Wessington Way

A loose filter holder was found at the summer audit. It is suspected that the analyser was sampling internally from 9-23 April; data have been deleted.

Wicken Fen

The SO₂ data continues to be poor quality and anomalously high during the quarter. Data have been deleted back to December 2014.

4.3 Data Capture and Station-Specific Issues - Greater London

A summary of data capture for England for April – June 2015 is given in Table 4.3:

Table 4.3 Data Capture for London, April-June 2015

Name	CO	PM10	PM25	NO2	O3	SO2	Average
Camden Kerbside		94.78	99.73	99.59			98.03
Ealing Horn Lane		53.25					53.25
Haringey Roadside			99.45	99.91			99.68
London Bexley			32.88	99.73			66.30
London Bloomsbury		33.75	0.00	99.77	99.91	99.73	66.63
London Eltham			99.31	95.56	99.73		98.20
London Haringey Priory Park South				99.91	99.91		99.91
London Harlington		32.97	99.95	99.82	99.91		83.16
London Harrow Stanmore			99.73				99.73
London Hillingdon				99.68	4.72		52.20
London Marylebone Road	93.45	98.12	97.53	99.04	98.17	99.04	97.56
London Marylebone Road		98.90	98.90				98.90
London N. Kensington	99.82	99.22	99.73	99.77	99.59	99.82	99.66
London N. Kensington		100.00	98.90				99.45
London Teddington				99.82	99.86		99.84
London Teddington Bushy Park			91.94				91.94
London Westminster			93.41	99.73			96.57
Southwark A2 Old Kent Road		75.37		80.72			78.04
Tower Hamlets Roadside				99.73			99.73

Name	CO	PM10	PM25	NO2	O3	SO2	Average
Number of Sites	2	9	13	14	8	3	19
Number of sites < 85 %	0	4	2	1	1	0	6
Number of sites < 90%	0	4	2	1	1	0	6
Network mean	96.63	76.26	85.50	98.05	87.72	99.53	87.19

Ealing Horn Lane

The data from Ealing Horn Lane was very noisy; data have been deleted this quarter up to a drier change and valve leak repair in May.

London Bexley

The PM_{2.5} FDMS had a high baseline at the summer audit; data have been deleted from 30 April to the end of the quarter.

London Bloomsbury

The PM_{2.5} baseline was high up to a drier change in August; data from 27 March to the end of June have been deleted. The PM₁₀ data was very noisy during the quarter, as the analyser suffered a number of faults in April and May; data from 13 April to 1 May have been deleted.

London Harlington

PM₁₀ data from 1 May have been deleted as the data was a regional outlier and the baseline was high at the summer audit.

London Hillingdon

A flow fault was found on the ozone analyser at the audit; data have been deleted from 5 April to the service in July.

Southwark A2 Roadside

The station remained offline whilst the enclosure and air conditioning were repaired on 20 April.

4.4 Data Capture and Station-Specific Issues – Wales

A summary of data capture for England for April – June 2015 is given in Table 4.4

Table 4.4 Data Capture for Wales, April - June 2015

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Aston Hill				99.77	99.82		99.79
Cardiff Centre	91.90	99.59	100.00	93.96	94.87	99.31	96.60
Chepstow A48		99.77	99.77	99.31			99.62
Cwmbran				99.82	99.86		99.84
Hafod-yr-ynys Roadside				99.31			99.31
Narberth		78.48		99.73	99.73	99.77	94.43
Newport		66.90	99.86	95.47			87.41

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Port Talbot Margam (Partisol)		98.90					98.90
Port Talbot Margam	99.54	77.56	97.71	95.05	99.73	99.50	94.85
Swansea Roadside		99.77	99.91	99.68			99.79
Wrexham		100.00	100.00	99.68		99.82	99.87
Number of stations	2	8	6	10	5	4	11
Number of stations < 85 %	0	3	0	0	0	0	0
Number of stations < 90%	0	3	0	0	0	0	1
Network mean	95.72	90.12	99.54	98.18	98.80	99.60	97.31

Newport

The PM₁₀ FDMS suffered a valve failure and a control board failure in June; data from 1-24 June have been deleted.

4.5 Data Capture and Station-Specific Issues – Scotland

A summary of data capture for England for April - June 2015 is given in Table 4.5:

Table 4.5 Data Capture for Scotland, April-June 2015

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Aberdeen		95.97	99.27	98.95	99.95		98.53
Aberdeen Union St Roadside				99.13			99.13
Auchencorth Moss (Partisol)		100.00	98.90		99.95		99.62
Auchencorth Moss (FDMS)		99.18	99.27				99.22
Bush Estate				99.95	99.95		99.95
Dumbarton Roadside				94.46			94.46
Dumfries				99.54			99.54
Edinburgh St Leonards	99.86	99.63	99.73	99.86	99.91	99.77	99.79
Eskdalemuir				98.53	98.44		98.49
Fort William				68.73	99.50		84.11
Glasgow Great Western Rd				99.54			99.54
Glasgow High Street		99.50	99.40	98.49			99.13

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Glasgow Kerbside				99.54			99.54
Glasgow Townhead		0.00	98.26	95.74	99.91		73.48
Grangemouth		32.33	99.08	94.87		99.31	81.40
Grangemouth Moray				98.40			98.40
Inverness		91.21	96.70	18.59			68.83
Lerwick					91.12		91.12
Peebles				70.51	99.95		85.23
Strath Vaich					99.45		99.45
Number of stations	1	8	8	16	10	2	20
Number of stations < 85 %	0	2	0	3	0	0	4
Number of stations < 90%	0	2	0	3	0	0	5
Network mean	99.86	77.23	98.83	89.68	98.81	99.54	93.45

Glasgow High Street

This station narrowly failed to make 90% data capture, although was only commissioned on 5 January.

Glasgow Townhead

The PM₁₀ analyser failed its baseline test. Data were rejected from 25 March to the date of the subsequent drier replacement at the summer service.

Grangemouth

The PM₁₀ showed a high baseline at the summer audit; data from 1 May to drier replacement have been deleted.

Inverness

The NO_x analyser is suspected of sampling internal cabin air following the LSO calibration on 17 March and this was not rectified at the subsequent service.

Peebles

Several periods of erratic NO data with large negative values were rejected during the quarter.

4.6 Data Capture and Station-Specific Issues - Northern Ireland

A summary of data capture for Northern Ireland for April - June 2015 is given in Table 4.6:

Table 4.6 Data Capture for Northern Ireland (plus Mace Head), April-June 2015

Name	CO	PM ₁₀	PM ₂₅	NO ₂	O ₃	SO ₂	Average
Mace Head					100.00		100.00
Armagh Roadside		46.11		95.38			70.74
Ballymena Ballykeel						99.86	99.86
Belfast Centre	92.31	100.00	99.95	97.39	87.55	99.77	96.16
Belfast Stockman's Lane		99.91		99.27			99.59
Derry		98.12	97.71	13.23	99.86	99.59	81.70
Lough Navar		94.87			99.73		97.30
Number of Sites	1	5	2	4	4	3	7
Number of sites < 85 %	0	1	0	1	0	0	2
Number of sites < 90%	0	1	0	1	1	0	2
Network mean	92.31	87.80	98.83	76.32	96.78	99.74	92.19

Armagh Roadside

The FDMS analyser performed very poorly during this quarter, partly due to the cooler fault which remained unattended to until May. No filter changes were carried out which contributed to the data loss. More data will probably be lost in Q3.

Derry

The NO_x analyser suffered a reaction cell fault, resulting in significant analyser drift. Data from 13 April to the end of June have been deleted.

5 Changes to Previously Ratified Data

The following data reported as ratified in previous periods have been amended for the reasons given:

- Belfast NO₂ reprocessed Oct 2014-Jan 2015.
- Chatham Centre Roadside NO₂, 8 – 28 March 2013, flat data deleted.
- Canterbury NO₂ reprocessed Q1-Q2 2013.
- Derry SO₂: noisy data deleted July-September 2013.
- Horley NO₂ Q2 2013-floating baseline, negative NO₂ peak in March 2014 - deleted.
- Ladybower SO₂ reprocessed 2013, and some noisy data deleted.
- Leeds CO: reprocessed zero June-Sept 2013
- London Bloomsbury PM_{2.5}, 27-31 March 2015 deleted, high baseline.
- London North Kensington. CO reprocessed June-July 2014
- London Teddington, NO₂ deleted 16 July-11 August and 1-22 September 2014, due to what appeared to be a sampling fault.
- Manchester Piccadilly SO₂ - deleted Q4 2014.
- Middlesbrough NO_x: Q1 and Q2 of 2014 reprocessed.
- Narberth SO₂: Q1 of 2013 reprocessed.
- Newcastle Centre PM₁₀: deleted 26-31 March 2015.
- St Osyth NO₂: reprocessed 2013-14.
- Wicken Fen NO: reprocessed drifting baseline, Q4 2013.
- Wicken Fen SO₂ – deleted data from December 2014-March 2015.

6 Health and Safety Report

A summary of instances when an AURN station went to 'HIGH' risk status during the quarter is given in Table 6.1:

Table 6.1 Summary of "High" Risk Station Safety Status Incidents, April-June 2015

Station	Risk	Date went to 'High'	Date resolved	Action taken
Sheffield Tinsley	Failed Electrical Safety Test	13/04/2015	30/04/2015	
Aberdeen	False alarm due to security testing	15/04/2015	15/04/2015	Informed relevant stakeholders including CMCU, LSO and Defra.
Reading New Town	Unsecured NO cylinder nearly fell on an LSO. Strap missing since cylinder replaced.	18/05/2015	28/05/2015	Cylinder secured.
Northampton Kingsthorpe	Site has failed the 5 yearly PIR electrical inspection.	21/05/2015	28/05/2015	No access was permitted to the site until the remedial action of a new RCD installation was completed.

7 Equipment Upgrade Requirements

The ozone photometers used for the Spring 2015 intercalibration are old (more than 10 years in some cases) and will need replacement shortly.

8 Station Infrastructures

No specific station infrastructure issues have been identified this quarter.

9 Conclusions and Recommendations

During Quarter 2 of 2015 there were a total of 152 AURN monitoring stations in operation.

The spring 2015 Ozone Intercalibration exercise was carried out during the quarter. These calibrations constitute the ISO17025 traceable calibration required every three months by the DQO. The intercalibration exercise is a vital step in the process of data ratification.

Data ratification for this quarter was completed by the deadline of 30 September 2015.

Ratified hourly average data capture for the network averaged 92.6% for all pollutants (O₃, NO₂, SO₂, CO, PM₁₀ and PM_{2.5}) during the 3-month reporting period April – June 2015. Average data capture for all pollutants was above the target of 85% (which allows for planned maintenance). There were 25 stations with data capture less than 85% for the period (33 below 90%).

The uncertainty of measurement for each analyser has been determined to ensure compliance with the Data Quality Objective. Nine analysers were found to be outside the required uncertainty.

Recommendations: None.



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