Derry City Council
LAQM Progress Report 2013

Bureau Veritas Air Quality

September 2013

Move Forward with Confidence

Document Control Sheet

Issue/Revision	Issue 1	Issue 2	Issue 3
Remarks	Draft	Final	Updated Final
Date	July 2013	August 2013	September 2013
Submitted to	Mark McCrystal	Mark McCrystal	Mark McCrystal
Prepared by	James Bellinger	James Bellinger	James Bellinger
Signature			
Approved by	Erwan Corfa	Erwan Corfa	Erwan Corfa
Signature			
Project number	7351442	7351442	7351442
File reference	2875	2875	2875

Disclaimer

This Report was completed by Bureau Veritas on the basis of a defined programme of work and terms and conditions agreed with the Client. Bureau Veritas' confirms that in preparing this Report it has exercised all reasonable skill and care taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

Bureau Veritas accepts no responsibility to any parties whatsoever, following the issue of the Report, for any matters arising outside the agreed scope of the works.

This Report is issued in confidence to the Client and Bureau Veritas has no responsibility to any third parties to whom this Report may be circulated, in part or in full, and any such parties rely on the contents of the report solely at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, the consultant asserts and retains all Copyright, and other Intellectual Property Rights, in and over the Report and its contents.

Any questions or matters arising from this Report should be addressed in the first instance to the report author.

Local Authority Officer	Mark McCrystal
Department	Environmental Health
Address	Derry City Council 98 Strand Road Derry BT48 7NN
Telephone	02871 365151
e-mail	Mark.McCrystal@derrycity.gov.uk
Report Reference number	APR 2013
Date	September 2013

Executive Summary

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

This Annual Progress Report considers all new monitoring data and assesses the data against the Air Quality Strategy objectives. It also considers any changes that may have an impact on air quality.

Air quality within the existing AQMAs continued to exceed the annual mean AQS objective for NO_2 in 2012. It is recommended to continue to monitor within the AQMAs and surrounding areas. Including Abercorn Road, where a previous Detailed Assessment concluded that an AQMA was not required. Derry City Council will review the requirement for a further Detailed Assessment based on the 2013 monitoring results.

Proposed actions based up findings in this assessment are;

- Continue to monitor within and around the AQMAs;
- Finalise the Air Quality Action Plan; and
- Proceed to the Annual Progress Report 2014.

Table of Contents

List of Tables

List of Figures

Appendices

1 Introduction

1.1 Description of Local Authority Area

Derry City is located on the coast, in the west of Northern Ireland, spreading across the banks of the River Foyle, with two bridges connecting the parts of the City. The City is very near the border with County Donegal in the Republic of Ireland, and is the second largest city in Northern Ireland.

Within the local authority boundaries lie Foyle Port and the City of Derry Airport. Road transport emissions have previously been found to be the dominant source of air pollution within the Derry City Council area.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995) and the Environment (NI) Order 2002, the Air Quality Strategy (AQS) for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment (USA) reports. Their purpose is to maintain continuity in the LAQM process.

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

1.3 Air Quality Objectives

The AQS objectives applicable to LAQM **in Northern Ireland** set out in the Air Quality Standards Regulations (Northern Ireland) 2010 are shown in Table 1-1. This table shows the objectives in units of microgrammes per cubic metre, µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide), with the number of exceedences in each year that are permitted (where applicable).

Table 1-1 - Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Table 1-2 provides a summary of the previous reports completed by Derry City Council (the Council) as part of the LAQM Review and Assessment process.

An AQMA was declared in February 2005 at the Creggan Road / Infirmary Road junction in Derry. Two other AQMAs were declared in 2011 at Dale's Corner and at the Buncrana Road / Racecourse Road junction. In 2012/2013, two further AQMAs were declared at Spencer Road and Strand Road. All AQMAs are due to the exceedence of the NO_2 annual mean AQS objective. Figures below show the locations of the existing AQMAs.

Table 1-2 - Summary of Previous Review and Assessment

Report	Summary
2004 Detailed Air Quality Modelling of Domestic Fuel Use and Road Traffic Emissions in Derry (Stage 3)	Exceedences of the annual mean NO_2 concentrations were modelled at the Creggan Road / Infirmary Road junction, and the Council subsequently declared an AQMA in February 2005, and a draft Air Quality Action Plan was released in November 2006. The 2004 Detailed Assessment concluded that PM_{10} exceedences were not expected; however it was not possible to rule out potential exceedences of the SO_2 or PM_{10} objectives due to the resolution of the modelling undertaken.
2005 Progress Report	The 2005 Progress Report provided a review of the most recent monitoring data within the local authority. Automatic monitoring of SO_2 and PM_{10} at Brandywell indicated a large drop in the number of 15-minute and daily mean exceedences, reflecting the decreased use of solid fuel in the area.
2006 Updating & Screening Assessment	The Updating & Screening Assessment identified 2 locations to consider for the Detailed Assessment of NO_2: Dale's Corner and the Buncrana Road / Racecourse Road Junction. It was concluded that no further assessment was required for carbon monoxide, benzene, 1,3-butadiene, lead or sulphur dioxide, however assessment was required for PM_{10} at a rural area near Claudy, and in the Culmore Point area.
2007 Detailed Assessment and Further Assessment	A Detailed Assessment was undertaken for Dale's Corner and Buncrana Road / Racecourse Road Junction following measured exceedence of the NO_2 annual mean objective. It was determined that a declaration of an AQMA at either location was not required at the time, as the modelling did not confirm exceedences of the air quality objectives at locations of relevant exposure. A Further Assessment was undertaken for the existing AQMA at Creggan Road / Infirmary Road, and it was concluded that there was a continuing need for the AQMA, though no

Report	Summary
	extension was considered necessary.
2008 Progress Report	Review of updated NO_2 monitoring data for the Creggan Road / Infirmary Road junction confirmed the continuing need for the AQMA. Decreases were seen in concentrations of SO_2. The Progress Report proposed that a new detailed dispersion modelling be undertaken at the Dale's Corner junction due to exceedences of the NO_2 annual mean objective recorded at a new monitoring diffusion tube site at no.5 Glendermott Road
2008 Final Air Quality Action Plan	The final Air Quality Action Plan, released in September 2008, included detailed dispersion modelling to quantify the potential impact of a number of traffic measures, which may be implemented to reduce air pollution in the area of the Creggan Road / Infirmary Road junction. Proposals included the removal of HGVs on specific road links within the AQMA.
2008 Dale's Corner Detailed Assessment	The assessment confirmed that exceedences of the NO_2 annual mean AQS objective were likely at the façade of properties along Glendermott Road and Limavady Road close to the junction and it was recommended that an AQMA encompassing these properties be declared. The Council declared the Dale's Corner AQMA in 2010.
2009 Updating & Screening Assessment	The Updating & Screening Assessment reviewed and assessed new monitoring data and potential new sources of pollutants within the area. There were no new or significantly changed sources identified which may cause potential exceedences of the AQS objectives. However, the assessment highlighted that a new Detailed Assessment was required with regard to NO_2 at Buncrana Road / Racecourse Road junction based on updated monitoring data.
2010 Air Quality Progress Report and Buncrana Road Detailed Assessment	Based on updated 2009 monitoring data, the air quality Progress Report 2010 confirmed exceedences of the NO_2 annual mean objective at several monitoring sites within the Creggan Road / Infirmary Road and Dale's Corner AQMAs and at the junction of Buncrana Road and Racecourse Road. The Detailed Assessment of Buncrana Road confirmed that a third AQMA was required at the junction for NO_2. The Council declared an AQMA at the junction in 2010.
2010 Dale's Corner Further Assessment	The report confirmed the need for an AQMA at Dale's Corner and provided detailed information related to source apportionment, population exposure and required reduction of NOx emissions to comply with the AQS objectives. The Further Assessment also considered the impact of several mitigation measures. Conclusions were that the combined effect of these measures would result in significant reductions in NO_2 levels, and compliance with the annual mean objective.
2011 Buncrana Road Further Assessment	The report confirmed the need for an AQMA at Buncrana Road and provided detailed information related to source apportionment, showing that road traffic is the main contributor to overall NO_2 levels, population exposure and required reduction of emissions to comply with the AQS objectives. The Further Assessment estimated that the annual mean objective would be met at all locations by 2014, however it was noted that this was an optimistic estimate, as predicted concentrations were likely to be underestimated as shown by recent NO_2 monitoring trends across the UK.

Report	Summary
2011 Progress Report	Review of updated monitoring data showed that areas within the existing AQMAs were still exceeding the NO_2 objective. In addition, four new areas of where exceedences were identified in Spencer Road, John Street, Strand Road and Abercorn Road. a Detailed Assessment was therefore recommended.
2012 Air Quality Action Plan Update	The Air Quality Action Plan update reviewed the first AQAP to incorporate the new AQMAs. The AQAP included details of the traffic measures which may be implemented to reduce air pollution in the identified AQMAs together with an update as to how measures identified in 2008 have been implemented.
2012 Updating & Screening Assessment	Review of updated monitoring data showed that areas within the existing AQMAs were still exceeding the NO_2 objective. It was noted that concentrations in John Street, Strand Road and Abercorn Road had fallen below objective levels and it was recommended to continue monitoring in these locations. Concentrations at Spencer Road were still exceeding the objectives and a Detailed Assessment was recommended.
2012 Detailed Assessments	Based on monitoring results, Derry CC decided to undertake Detailed Assessments at Spencer Road, John Street, Strand Road and Abercorn Road. It was concluded, based on a combination of pollutant monitoring and predictive modelling, that AQMA's be declared at Spencer Road and Strand Road. The report found that there was no requirement to declare for John Street and Abercorn Road.
2012/2013 AQMA declaration	Based upon the outcome of the Detailed Assessments at Spencer Road and Strand Road, two new small AQMA areas were declared.

Figure 1 - Map of AQMA Boundary - Creggan Road

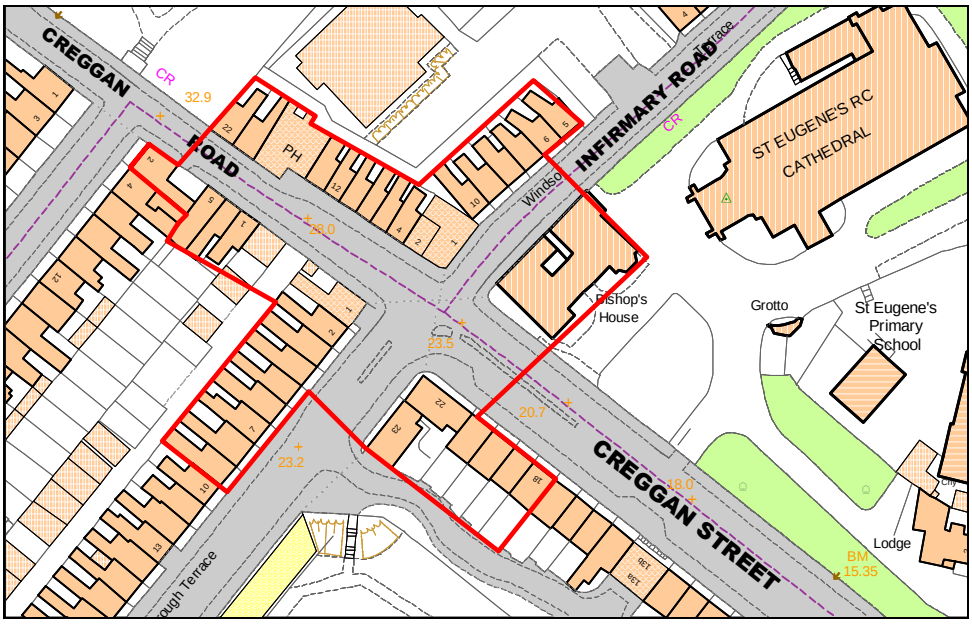


Figure 2 - Map of AQMA Boundary - Dale's Corner

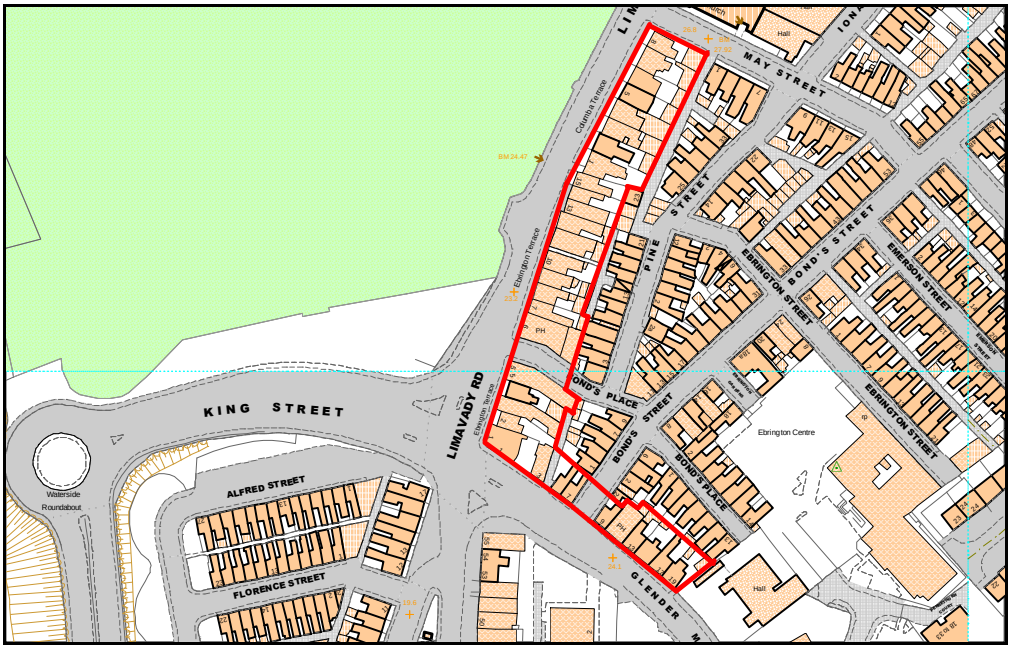


Figure 3 - Map of AQMA Boundary - Buncrana Road

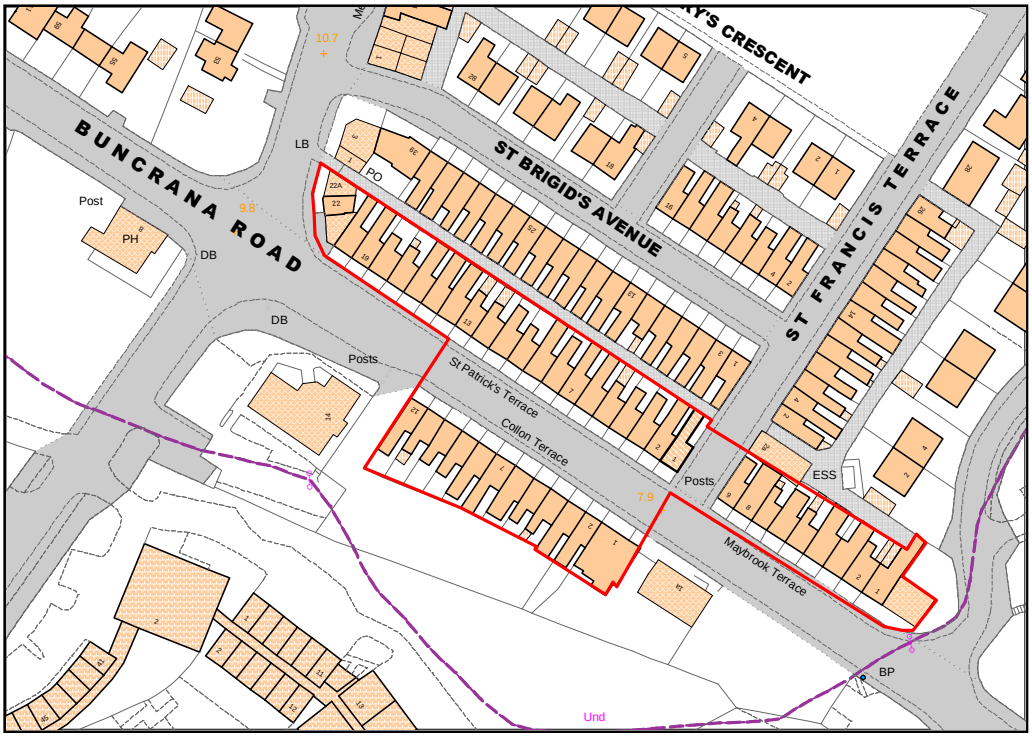


Figure 4 - Map of AQMA Boundary – Spencer Road

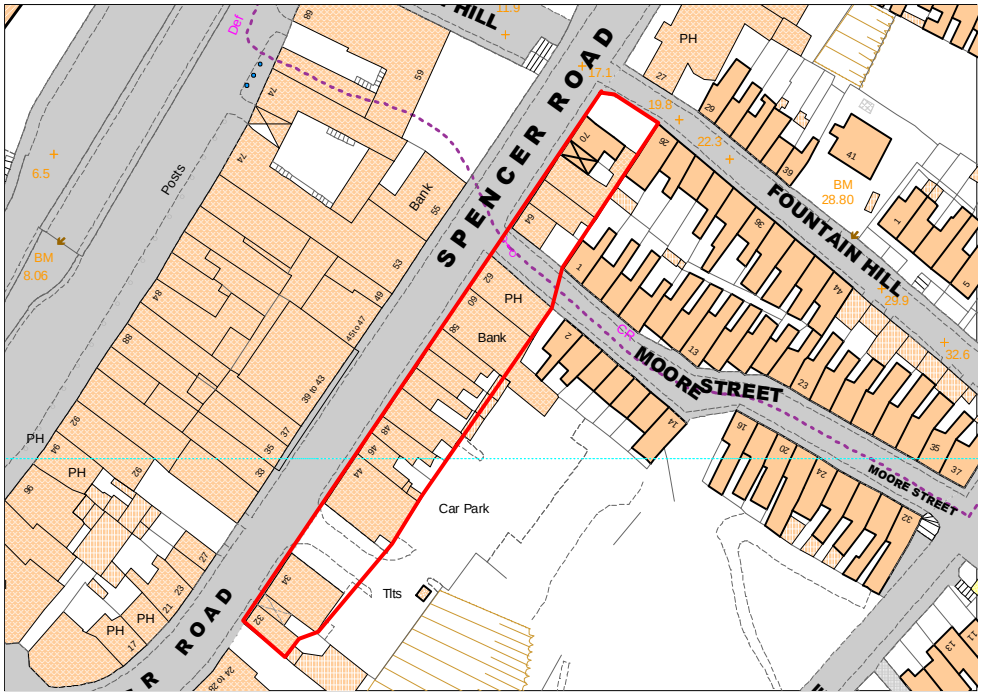
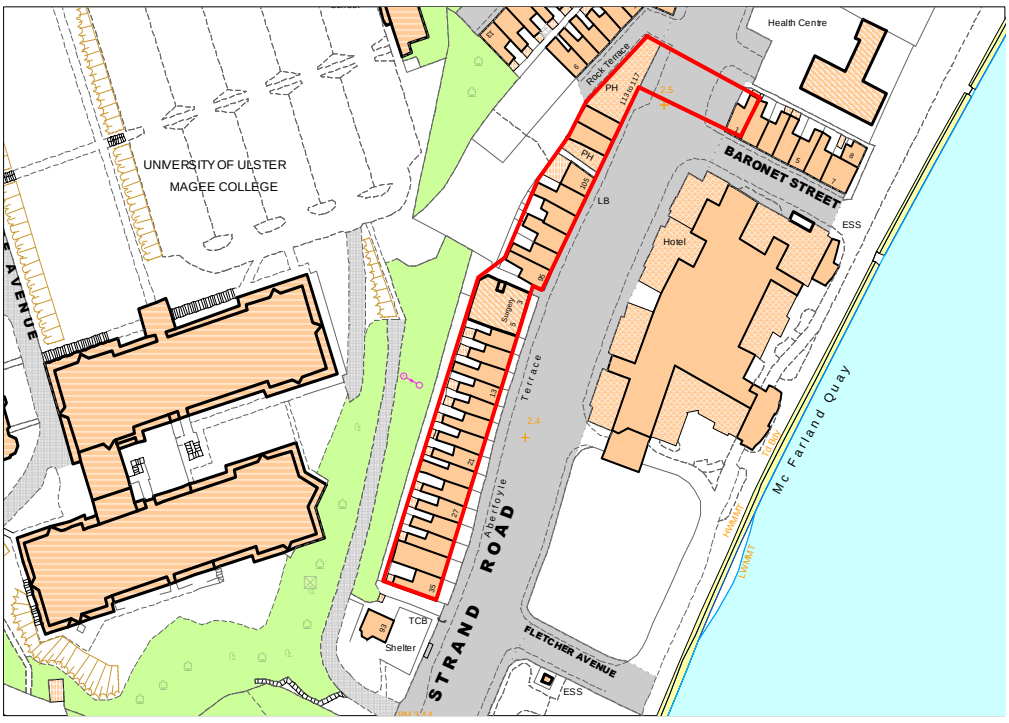


Figure 5 - Map of AQMA Boundary – Strand Road



2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

The Council operated three automatic monitoring sites in 2012, in Brooke Park (urban background), Dale's Corner and Marlborough Street (both roadside sites). The location of these monitoring sites is shown in Figure 6. Dale's Corner and Marlborough Street sites monitor NO_x / NO_2 only, whilst Brooke Park monitors PM_{10}, $PM_{2.5}$, O_3, and SO_2.

The Marlborough Street monitoring station was installed in November 2011, within the Creggan Road AQMA.

The quality assurance and quality control procedures are set out in Appendix A.

Figure 6 - Map of Automatic Monitoring Sites

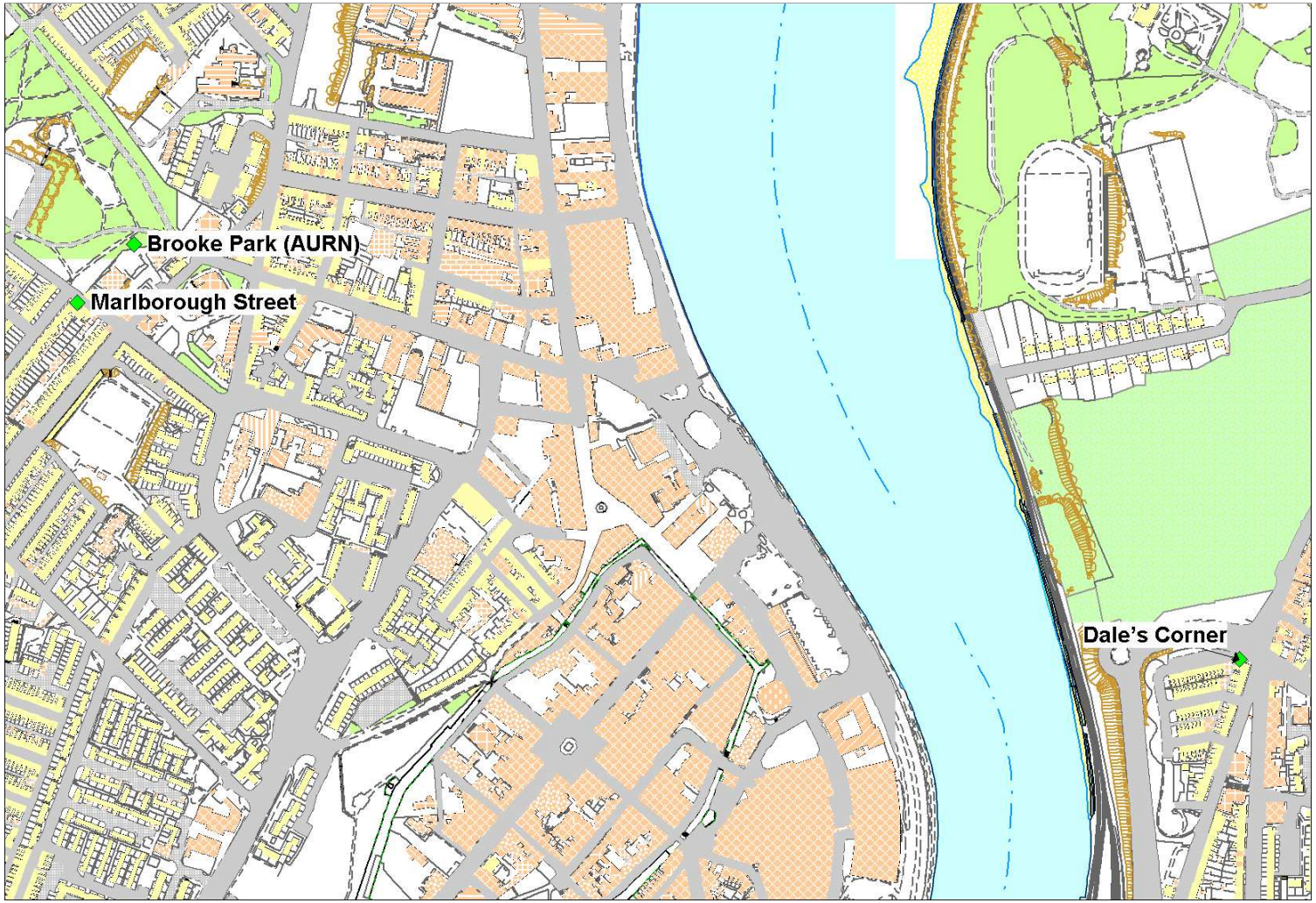


Table 2-1 - Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to Kerb of Nearest Road *(N/A if not applicable)*	Does this ocation represent worst-case exposure?
Brooke Park (AURN)	Urban Background	242962	417217	O_3, NO_2, NO_X, SO_2, PM_{10}, $PM_{2.5}$	N	FDMS and chemiluminescence monitor	N (approx. 50m, background site)	N/A	N/A
Dale's Corner	Roadside	244178	416760	NO_2, NO_x	N	chemiluminescence monitor	Y 1.5m	2m	Y
Marlborough Street	Roadside	242900	417152	NO_2, NO_x	Y	chemiluminescence monitor	Y 1m	2m	Y

2.1.2 Non-Automatic Monitoring Sites

The Council monitored NO_2 at 38 sites across Derry using passive diffusion tubes. The location of all sites is shown in Figure 7 and details of the diffusion tube sites are provided in

Table 2-2. Most sites have been installed with either duplicate tubes or triplicate tubes to improve accuracy. All three continuous monitoring sites have triplicate tubes co-located with them.

In 2012 seven sites were installed, fifteen locations were removed. Details of these sites are shown below.

The new monitoring sites installed in 2012 were:

- 17 The Branch (B1);
- 2 Marlborough Street (M1-3);
- 65 Abercorn Road (AB1);
- 67 Abercorn Road (AB5);
- 115 Bishop Street (AB7);
- 45 Francis Street (FR3); and
- 3 Francis Street (FR1).

The following sites were discontinued in 2012:

- 17 The Branch (B1)- *Started in Jan, closed in Oct*;
- 76 Racecourse Road (RC1);
- 1 Castleview Park (RC2);
- 31 Balmoral Avenue (RC3);
- 38 Glengalliagh Park (GL1);
- 7 Capall Court (GL3);
- 3 Farren Park (F1);
- 8 Abercorn Road (AB2);
- 10 Cheadle Park (CH1);
- 1 Clooney Terrace (TR1);
- 11 Duddy's Court (TR2);
- 49 Bradley Park (GL4);
- 1 Maybrook Park (RC4);

- 92 Spencer Road (SP2); and
- Glendermott Road (THE1and THE2).

Diffusion tubes in 2012 were prepared and analysed by Environmental Scientifics Groups (ESG). The tube preparation is 50% TEA in water.

Data have been corrected using a bias adjustment factor, which is an estimate of the difference between diffusion tube concentrations and continuous monitoring, the latter assumed to be a more accurate method of monitoring. The technical guidance LAQM.TG (09) provides guidance with regard to the application of a bias adjustment factor to correct diffusion tubes. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data from NO_x / NO_2 continuous analysers. Alternatively, the national database[1] of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

For 2012, a bias adjustment factor of 0.86 has been used to adjust the diffusion tube data, based on the local colocation data from the three continuous monitoring sites. The reasons for using the local bias adjustment factor, rather than the national factor, are discussed in Appendix A.

[1] http://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

Figure 7 - Map of Diffusion Tube Locations

Northern Derry

Southern Derry

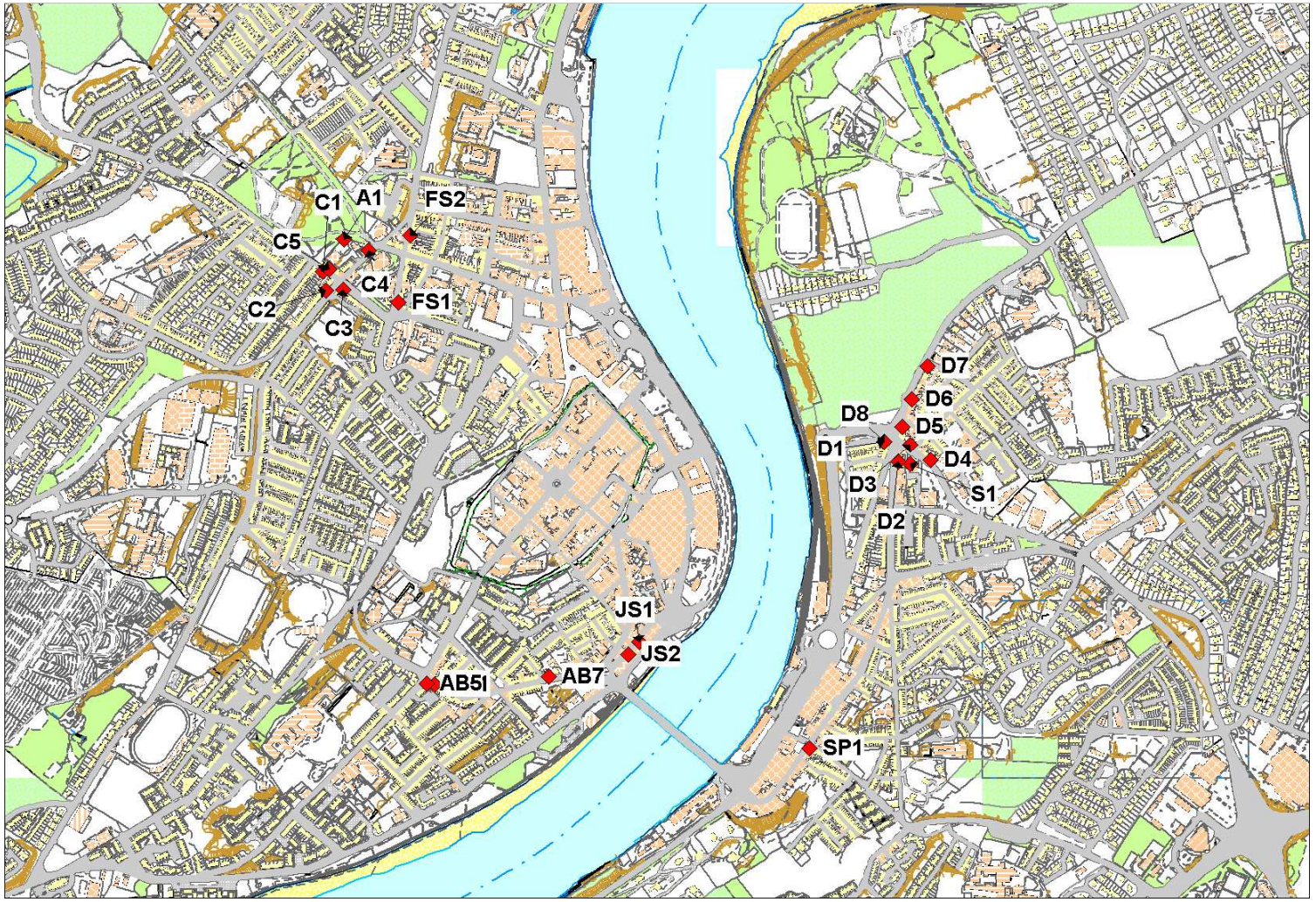


Table 2-2 - Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to Kerb of Nearest Road *(N/A if not applicable)*	Does this Location Represent Worst-case Exposure?
Brooke Park AURN										
A1-3 (triplicate collocated)	Brooke Park Continuous Monitoring Site (AURN)	Urban Background	242962	417217	NO_2	N	Y	N	55m	N/A
Cathedral										
C1-2	3 Creggan Road	Roadside	242913	417144	NO_2	Y	N	Y- 0m	2m	Y
M1-3 (triplicate collocated)	2 Marlbourough Street	Roadside	244238	416708	NO_2	Y	Y	Y- 0m	2m	Y
C3-4	6 Marlborough Terrace	Roadside	242921	417101	NO_2	Y	N	Y- 0m	4.5m	Y
C5-6	22A Creggan Street	Urban Background	242959	417102	NO_2	Y	N	Y-0m	5.5m	Y
C7-8	1 Windsor Terrace	Roadside	243017	417191	NO_2	N	N	Y -0m	3m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to Kerb of Nearest Road *(N/A if not applicable)*	Does this Location Represent Worst-case Exposure?
C9-10	14 Creggan Road	Roadside	242928	417148	NO_2	Y	N	Y-0m	4m	Y
Dale's Corner										
D1-3 (triplicate collocated	Monitor	Roadside	244178	416760	NO_2	N	Y	Y-1.5m	3m	Y
D4-5	52 Clooney Terrace	Urban Centre	244210	416714	NO_2	N	N	Y-0m	6.5m	Y
D6-7	5 Glendermott Road	Roadside	244238	416753	NO_2	Y	N	Y-0m	2m	Y
D8-9	Glendermott Road	Roadside	244283	416718	NO_2	Y	N	Y- 0m	3m	Y
D10-11	4 Ebrington Terrace	Roadside	244219	416794	NO_2	Y	N	Y-0m	4m	Y
D12-13	12 Ebrington Terrace	Roadside	244240	416856	NO_2	Y	N	Y-0m	3m	Y
D14-15	9 Columba Terrace	Roadside	244277	416931	NO_2	Y	N	Y-0m	6m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to Kerb of Nearest Road *(N/A if not applicable)*	Does this Location Represent Worst-case Exposure?
D16-17	17 Melrose Terrace	Roadside	244178	416760	NO_2	N	N	Y-0m	3m	Y
Pennyburn										
P1-2	53 Messines Park	Suburban	243449	419013	NO_2	N	N	Y-0m	14m	Y
P3-4	57 Messines Park	Suburban	243418	419016	NO_2	N	N	Y-0m	11m	Y
P5-6	8 Maybrook Terrace	Roadside	243571	418910	NO_2	Y	N	Y-0m	5m	Y
P7-8	19 St Patricks Terrace	Roadside	243480	418970	NO_2	Y	N	Y-0m	5m	Y
P9-10	1 Collon Terrace	Roadside	243539	418908	NO_2	Y	N	Y-0m	5m	Y
P11-12	5 Collon Terrace	Roadside	243519	418921	NO_2	Y	N	Y-0m	5m	Y
Strand Road										
S1-2	99 Strand Road	Roadside	243522	417894	NO_2	Y	N	Y-0m	3m	Y
S3-4	Rockmills	Urban Centre	243607	418037	NO_2	Y	N	Y-0m	10m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to Kerb of Nearest Road *(N/A if not applicable)*	Does this Location Represent Worst-case Exposure?
Abercorn Road										
AB1-2	63 Abercorn Road	Roadside	243166	416211	NO_2	N	N	Y-0m	2m	Y
AB3-4	65 Abercorn Road	Roadside	243422	416230	NO_2	N	N	Y-0m	4.5m	Y
AB5-6	67 Abercorn Road	Roadside	243148	416213	NO_2	N	N	Y-0m	4.5m	Y
AB7-8	115 Bishop Street	Roadside	243422	416230	NO_2	N	N	Y-0m	1.5m	Y
Francis Street										
FS1	3 Francis Street	Roadside	243084	417075	NO_2	N	N	Y-0m	2m	Y
FS3-4	45 Francis Street	Roadside	243110	417225	NO_2	N	N	Y-0m	1.5m	Y
Glengalliagh										
GL1-2	38 Glengalliagh Park	Suburban	243122	419915	NO_2	N	N	Y-0m	21m	Y
GL3	7 Capal Court	Suburban	243912	420720	NO_2	N	N	Y-0m	23m	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Pollutants Monitored	In AQMA?	Is Monitoring Collocated with a Continuous Analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to Kerb of Nearest Road *(N/A if not applicable)*	Does this Location Represent Worst-case Exposure?
John Street										
JS1-2	10 John Street	Roadside	243627	416308	NO_2	N	N	Y-0m	2m	Y
JS3-4	12 John Street	Roadside	243602	416279	NO_2	N	N	Y-0m	2m	Y
Racecourse										
RC1	76 Racecourse Road	Suburban	243889	420061	NO_2	N	N	Y-0m	8m	Y
RC2	1 Castleview Park	Suburban	243886	419842	NO_2	N	N	Y-0m	9m	Y
RC3	31 Balmoral Avenue	Suburban	243658	419416	NO_2	N	N	Y-0m	10m	Y
Spencer Road										
SP1-2	70 Spencer Road	Roadside	244011	416068	NO_2	Y	N	Y-0m	2m	Y
The Branch										
B1-2	17 The Branch	Roadside	242171	419490	NO_2	N	N	Y-0m	5m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

The Council monitored NO_2 at three locations during 2012, Brooke Park, Dale's Corner and Marlborough Street.

Results from 2012 indicate the annual mean objective was largely exceeded at Marlborough Street, located within the existing Creggan Road AQMA. The concentration of 64µg/m^3 is fall from the 2011 value of 71µg/m^3. Despite the high annual mean concentration monitored, the hourly mean objective was met at this site, with only 3 exceedences of the 200µg/m^3 limit being recorded in 2012, whilst the objective allows up to 18 exceedences a year.

The concentrations at Dale's Corner and Broke Park remained fairly stable in 2012 compared to 2011. Looking at longer term trends at all the sites there has been no clear increase or decrease in NO_2, as illustrated in Figure 8.

Table 2-3 - Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Period of Monitoring %	Valid Data Capture 2012 %	Annual Mean Concentration (µg/m^3)					
					2007	2008	2009	2010	2011	2012
Brooke Park	Urban Background	N	99	99	12.6	18.5	15.8	19.2	15.6	15.0
Dale's Corner	Roadside	N	93	93	38.5	**40.2**	39.0	**43.2**	33.6	34.5
Marlborough Street	Roadside	Y	97	97	-	-	-	-	**71.3**	**63.4**

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Figure 8 - Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

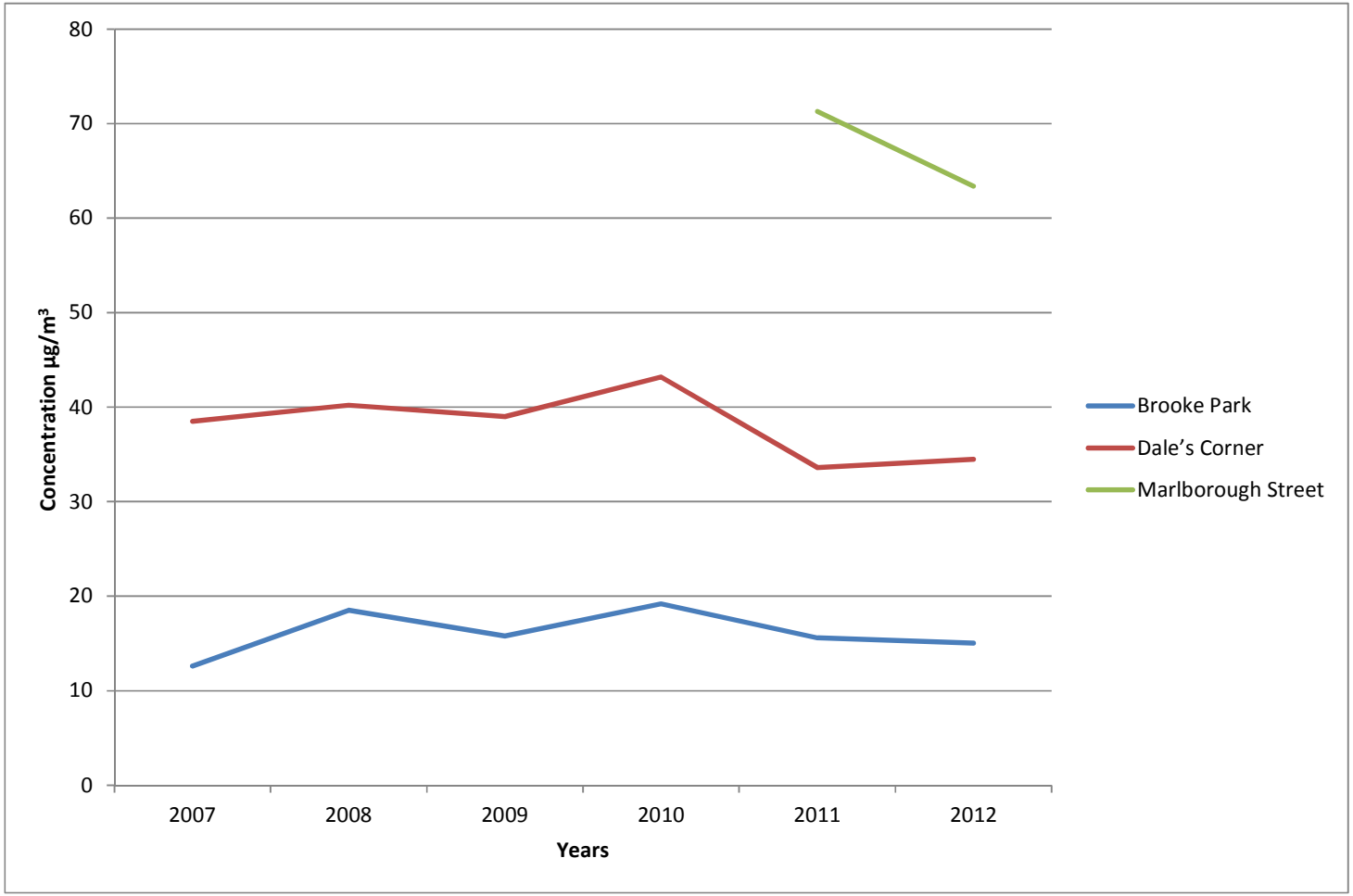


Table 2-4 - Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Period of Monitoring %	Valid Data Capture 2012 %	Number of 1-Hour Means > 200 µg/m^3 (if % data > 90% the 99.8th percentile shown in brackets)					
					2007	2008	2009	2010	2011	2012
Brooke Park	Urban Background	N	99	99	0 (63)	0	0 (79.6)	0	0	0
Dale's Corner	Roadside	N	99	99	0 (155)	11	0	8 (138)	1	0
Marlborough Street	Roadside	Y	97	97	-	-	-	-	0 (181)	3

In bold, exceedence of the NO_2 1-hour mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

Diffusion Tube Monitoring Data

The nitrogen dioxide diffusion tube data for the past 6 years are summarised in Table 2-5. The full dataset (monthly mean values) for 2012 are included in Appendix A.

Results for year 2012 have been bias adjusted using the national bias adjustment factor and have been annualised where data capture was less than 9 months. Full details regarding the annualisation can be found in Appendix A.

For the 2012 data set, there were seven sites where the NO_2 annual mean AQS Objective was exceeded. All locations of exceedence were within the current AQMAs.

The sites that monitored an exceedence in 2012 were:

- C1-2 - 3 Creggan Road (Creggan Road AQMA);
- S1-3 – 2 Marlborough Street (Creggan Road AQMA);
- C5-6 - 22A Creggan Road (Creggan Road AQMA);
- C9-10 – 14 Creggan Road (Creggan Road AQMA);
- D6-7 – 5 Glendermott Road (Dale's Corner AQMA);
- D8-9 – 19 Glendermott Road (Dale's Corner AQMA);
- D10-11 – 4 Ebrington Terrace (Dale's Corner AQMA); and
- AB1-2 – 63 Abercorn Road.

Of the eight sites exceeding in 2012, five also exceeded in 2011. One site which was not listed as exceeding in 2011 is a new tube location set up as a triplicate in 2012 at 2 Marlborough Street, this site is collocated with the continuous monitor which recorded a higher concentration of 63.4µg/m^3. The site at 14 Creggan Road, within the Creggan Road AQMA has historically been exceeding or close to the objective as it was in 2011 (39.8µg/m^3). Also site AB1-2 63 Abercorn Road exceeded the objective in 2012 (40.4µg/m^3). This site has been exceeding or close to the objective for a number of years (39.2µg/m^3 in 2011). A Detailed Assessment was carried out for this location in 2012 which found no requirement to declare an AQMA at this location. It would be recommended to continue to monitor at this location.

Concentrations within the two newest AQMAs at Strand Road and Spencer Road are both below the objectives in 2012.

With respect to the NO_2 1-hour mean objective, there could be a potential risk of exceedence where the annual mean concentration is greater than 60µg/m^3. From the 2012 results site C1-2, 3 Creggan Road is the only site which recorded a concentration above 60µg/m^3 and so the short-term objective could potentially be exceeded in this area. However, the Council installed the Marlborough continuous monitor opposite the C1-2 diffusion tube monitoring site in 2011. The full results from the real-time analyser in 2012 indicate that there is no breech of the 1-hour mean objective at this location, despite the fact that the monitored annual mean was over 60µg/m^3. It is therefore unlikely that the 1-hour mean objective could be exceeded in this area.

Table 2-5 - Results of NO_2 Diffusion Tubes 2007-2012

Site ID	Site Type	2012 Data Capture	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3					
				2007	2008	2009	2010	2011	2012
				(National Bias Adjustment Factor = 0.88)	(Local Bias Adjustment Factor = 1.002)	(Local Bias Adjustment Factor = 0.93)	(Local Bias Adjustment Factor =0.99)	(Local Bias Adjustment Factor = 0.90)	(Local Bias Adjustment Factor = 0.86)
Brooke Park AURN									
A1-3	Urban Background	10	N	15	19	16	20	15.6	19.9
Cathedral									
C1-2	Roadside	12	Y	**58**	**76**	**64**	**94**	**68.1**	**62.0**
S1-3	Roadside	11	Y						**54.2**
C3-4	Roadside	11	Y	31	**45**	37	**48**	34.8	39.2
C5-6	Suburban	10	Y	38	**49**	**42**	**54**	**41.5**	**41.8**
C7-8	Roadside	11	N	25	37	23	23	26.4	23.3
C9-10	Roadside	12	Y	37	**46**	**41**	**63**	39.8	**46.3**
Dales Corner									
D1-3	Roadside	12	N	31	**40**	35	**44**	33.5	32.8
D4-5	Urban Centre	10	N	25	33	30	**41**	28	27.0
D6-7	Roadside	12	Y	**44**	**64**	**48**	**71**	**44**	**50.0**
D8-9	Roadside	12	Y	-	-	-	-	**50.4**	**53.2**
D10-11	Roadside	12	Y	-	**57**	**54**	**68**	**46.6**	**51.9**
D12-13	Roadside	12	Y	-	-	-	-	37.6	35.4

D14-15	Roadside	12	Y	-	-	-	-	31.8	32.6
D16-17	Roadside	12	N	-	-	27	**41**	32	31.9
Pennyburn									
P1-2	Suburban	12	N	20	25	27	29	21.8	21.4
P3-4	Suburban	12	N	27	31	28	**41**	25.8	27.6
P5-6	Roadside	12	Y	-	-	-	-	25.2	27.0
P7-8	Roadside	12	Y	32	**51**	28	**51**	32.4	33.0
P9-10	Roadside	12	Y	-	-	-	-	37.4	33.7
P11-12	Roadside	12	Y	37	**52**	**42**	**52**	**45.7**	39.8
Strand Road									
S1-2	Roadside	12	N	39	**44**	37	**52**	39.5	37.3
S3-4	Urban Centre	12	N	29	**44**	37	**48**	33.2	30.0
Abercorn Road									
AB1-2	Roadside	12	N	33	**46**	36	**47**	39.2	**40.4**
AB3-4	Roadside	5	N	-	-	-	-	-	25.5
AB5-6	Roadside	4	N	-	-	-	-	-	22.2
AB7-8	Roadside	5	N	-	-	-	-	-	20.5
Francis Street									
FS1	Roadside	1	N	-	-	31	**42**	26.2	26.5
FS3-4	Roadside	1	N	-	-	39	**44**	29.4	26.1
Glengalliagh									
GL1-2	Suburban	7	N	-	-	22	25	20.9	18.3
GL3	Suburban	7	N	-	-	19	30	17.8	19.7
John Street									

JS1-2	Roadside	10	N	-	-	37	**47**	35.9	32.7
JS3-4	Roadside	8	N	-	-	37	**48**	36.3	33.9
Racecourse									
RC1	Suburban	5	N	-	-	25	25	18.0	19.7
RC2	Suburban	6	N	-	-	19	23	18.1	20.5
RC3	Suburban	6	N	-	-	21	25	19.4	25.2
Spencer Road									
SP1-2	Roadside	12	N	-	-	**40**	**51**	**42.3**	38.2
The Branch									
B1-2	Roadside	8	N	-	-	-	-	-	27.7

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

2.2.2 Particulate Matter (PM_{10})

PM_{10} is measured at the Brooke Park AURN site. Data capture for the year was low with only 50% being recorded in 2012. The data has been annualised based on technical guidance LAQM.TG(09), to provide an estimate of the annual mean for 2012. Results are presented in Table 2-6 and Table 8 below.

The results of PM_{10} monitoring indicate that the AQS objectives are currently being met at the Brooke Park AURN location.

Table 2-6 - Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration (µg/m^3)					
						2007	2008	2009	2010	2011	2012
Brooke Park	Urban Background	N	50	50	Y	20.6	23.2	22.3	22.5	18.6	18.4

Table 2-7 - Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2012 %	Confirm Gravimetric Equivalent	Number of 24-Hour Means > 50 µg/m^3 *					
						2007	2008	2009	2010	2011	2012
Brooke Park	Urban Background	N	50	50	Y	6	13 (36.7)	10 (39.0)	21 (39.7)	6	2 (32.0)

In bold, exceedence of the PM_{10} 24-hour mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)* If data capture for full calendar year is less than 90%, the 90.4th percentile of 24-hour means is shown in brackets.

2.2.3 Sulphur Dioxide (SO_2)

Sulphur dioxide is measured at the Brooke Park AURN site. Results for 2012, which are provided in Table 9 below, show that concentrations did not exceed the 15 minute, 1-hour or 24-hour objectives.

Table 2-8 - Results of Automatic Monitoring for SO_2: Comparison with Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture 2012 %	Number of*		
					15-minute Means > 266µg/m^3	1-hour Means > 350µg/m^3	24-hour Means > 125µg/m^3
Brooke Park	Urban Background	N	98	98	0	0	0

In bold, exceedence of the relevant AQS objective (15-min mean = 35 allowed/year; 1-hour mean = 24 allowed/year; 24-hour mean = 3 allowed/year)

* If data capture for full calendar year is less than 90%, the percentiles are shown in brackets (15-min mean = 99.9th ; 1-hour mean = 99.7th ; 24-hour mean = 99.2th percentile)

2.2.4 Benzene

No monitoring of benzene takes place in the City. All previous LAQM reports have identified that there is no likely exceedence of the benzene AQS objectives.

2.2.5 Particulate Matter ($PM_{2.5}$)

$PM_{2.5}$ is measured at the Brook Park AURN site. $PM_{2.5}$ objectives have been set out in the UK Air Quality Regulations. Although there is no requirement for local authorities to review and assess $PM_{2.5}$ against these objectives as part of the LAQM

regime, results have been reported as recommended by Technical Guidance LAQM.TG(09).

The $PM_{2.5}$ results indicate that concentrations are well below the target value of 25µg/m^3 in 2012.

Table 2-9 - Results of Automatic Monitoring for Particulates ($PM_{2.5}$)

Site ID	Site Type	Within AQMA?	$PM_{2.5}$ Annual Mean 2012 (µg/m^3)*
Brooke Park	Urban Background	N	15
* As a comparison, the UK Air Quality Standard objective for $PM_{2.5}$ is 25µg/m^3 (target value) for England			

2.2.6 Ozone (O_3)

Ozone is measured at the Brooke Park AURN site. O_3 is a transboundary pollutant; the sources of O_3 are frequently spatially distant from the measured site of the concentrations. This pollutant is not a prescribed air quality objective for LAQM purposes; however, it has been reported as recommended by Technical Guidance LAQM TG(09).

The results from 2012 indicate the AQS objective for O_3, of 10 8-hour running mean exceedences of 100µg/m^3 per year is being exceeded.

Table 2-10 - Results of Automatic Monitoring for Ozone: Comparison with Objectives

Site ID	Site Type	Within AQMA?	Description	% Data capture 2012	Number of Exceedences in 2012
Brooke Park	Urban Background	N	Maximum 8-hour running mean > 100 µg/m^3	99	35
Exceedence of the ozone AQS objective (100µg/m^3 10 exceedences allowed per year)					

2.2.7 Summary of Compliance with AQS Objectives

Derry City Council has measured concentrations of NO_2 above the annual mean objective at relevant locations outside of the AQMAs in the Abercorn Road area. A **Detailed Assessment** has been completed for this area, concluding at an AQMA was not required. The council will continue to monitor in this area and determine if a further Detailed Assessment be undertaken based on the 2013 results.

3 New Local Developments

3.1 Road Traffic Sources

Since the previous Review and Assessment report, there have been none of the following new or newly identified developments:

- Narrow congested streets with residential properties close to the kerb;
- Busy streets where people may spend one hour or more close to traffic;
- Roads with a high flow of buses and/or HGVs;
- Junctions;
- New roads constructed or proposed;
- Roads with significantly changed traffic flows; or
- Bus or coach stations.

3.2 Other Transport Sources

Since the previous Review and Assessment report, there have been none of the following new or newly identified developments:

- Airports;
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m;
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m; or
- Ports for shipping.

3.3 Industrial Sources

The Council have identified two planning application for an industrial source which may have an impact upon air quality.

- Waste Gasification Plant at Enviroparc, Electra Road, Derry. An air quality impacts report has been carried out for this development and concluded no adverse impact upon air quality will occur as a result of this development.

- Evermore renewable Energy Biomass plant at Lisahally. An air quality impact assessment has been carried out and concluded that there will be no adverse impact upon air quality as a result of this development.

3.4 Commercial and Domestic Sources

Since the previous Review and Assessment report, there have been none of the following new or newly identified developments:

- Biomass combustion plant – individual installations;
- Areas where the combined impact of several biomass combustion sources may be relevant; or
- Areas where domestic solid fuel burning may be relevant.

3.5 New Developments with Fugitive or Uncontrolled Sources

Since the previous Review and Assessment report, there have been none of the following new developments:

- Landfill sites;
- Quarries;
- Unmade haulage roads on industrial sites;
- Waste transfer stations etc; or
- Other potential sources of fugitive particulate emissions.

Derry City Council confirms that there is one newly identified local development which may have an impact on air quality within the Local Authority area.

Derry City Council confirms that all the following have been considered:

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

4 Local / Regional Air Quality Strategy

Local Strategy

The Derry Area Plan 2011 is a Development Plan prepared by the Planning Service, an agency within the Department of the Environment under the provisions of Part III of the Planning (NI) Order 1991. The Plan promotes the concept of sustainable development based on the belief that conservation and development are not mutually exclusive alternatives. As part of the plan a City Development Limit has been established around all future development area beyond which there is a presumption of no further development. This separates Derry City from Culmore, Newbuildings and Strathfoyle and restricts future development to the periphery of the City although it is assumed that this will provide sufficient land for these developments to take place. Thirteen small settlements have been identified in the district which are smaller than villages and do not possess the same range of service provision; these have been selected for limited development such that the character will be reflected in the scale and style of each settlement. The total theoretical provision of future dwellings is 11,500 which is greater the 8,500 dwellings anticipated need.

The Plan outlined development zones within the City Development Limit in which future developments could take place provided that such developments met a number of conditions relating to design. These included the provision of open spaces in housing and commercial developments, satisfactory layouts for pedestrian and cycling linkages and roads layout and car parking and access provision. Proposals close to the City and preserving future access to adjacent parcels would be given greater importance. New Industrial developments in existing industrial areas would only be granted permission if they make full use of the existing infrastructure. Commercial development should consolidate the commercial centre of the City and would not lead to the detrimental impacts on the air quality and traffic movements.

Regional Strategy

"*Shaping Our Future*" is a Regional Development Strategy (RDS) (updated in January 2011) which offers a strategic and long-term perspective on the future development of Northern Ireland up to the year 2035. The RDS strategy for Derry is the improvement and the enhancement of the natural environment, the economic and

social opportunities and the encouragement of tourism to the area through improvements in the built environment and transport infrastructure and linkage to the natural gas network. The rural community has greater relevance to maintain the rural way of life whilst providing transport and economic opportunities in a sustainable way. Its overall aim is:

> *"to develop an attractive and prosperous rural area, based on a balanced and integrated approach to the development of town, village and countryside, in order to sustain a strong and vibrant rural community, contributing to the overall well-being of the Region as a whole as part of the review process an analysis of significant spatial trends was carried out to determine new challenges along with key policy drivers."*

Specifically, changes to the policy, updated in January 2011, with regard to air quality are summarised below:

- Consideration needs to be given to ways to reduce energy consumption towards more sustainable methods of production;
- Reduce the need to use the car by designating neighbourhoods that have shops, offices, schools, churches, parks and other amenities near homes so that there are greater opportunities to use sustainable modes of transport;
- Adapt the existing transport network to facilitate the modal shift away from cars;
- Increase the use of renewable energies;
- Develop strong linkages between policies for managing air pollution and climate change; and
- Improve energy efficiency of buildings.

5 Planning Applications

The Council keeps a log of all planning applications for which an air quality assessment will be provided. Four planning applications that could have an impact on air quality are currently identified in Derry. Air quality assessments have been requested/are currently being completed for these planning applications and details will be provided in the next USA report.

Details of the four planning applications are provided below.

- **Planning Application No. A/2010/0241/O**

Development:

Mixed use development including hotel, offices, start-up business units, healthcare facilities, housing, retail and associated highway, footpath, landscape and other works and improvements.

Location:
Lands to the east of Crescent Link and north of Sevenoaks, Londonderry.

- **Planning Application No. A/2012/0335/O**

Development:
Major mixed use development to include residential; office, leisure, Light industrial; education; community facilities; retail; cafes, bars and restaurants; associated multi-storey and surface car parking; landscaping and environmental and roads infrastructure (including an enhanced Pennyburn roundabout).

Location:
Site of former army base (known as Fort George) to the east of Strand Road south of Bay Road and bounded by Lough Foyle to the east Strand Road Derry Londonderry.

- **Planning Application No. A/2011/0226/F**

Development:

Food Superstore and 100 bed hotel with associated access. (including a new roundabout on Gransha Park) and carparking, servicing arrangements, landscaping, general site works and demolition of left hand entrance building at the entrance to the Gransha Estate.

Location:

Lands at Gransha Londonderry, fronting onto Madams Bank Road (A515) & Clooney Road (A2) BT47 6TB.

- **Planning Application No. A/2011/0207/F**

Development:

310 dwellings (41 detached, 216 semi-detached, 47 townhouses and 6 apartments), landscaping and ancillary works including access from signalised junction on Crescent Link incorporating Sperrin Park.

Location:

Lands east of Crescent Link, north of Ballyoan cemetery, west of Rossdowney Road and South east of Caw roundabout Londonderry.

6 Air Quality Planning Policies

Northern Ireland development plans are prepared by the Planning Service rather than local authorities. Derry Area Plan 2011 (refer to Section 5) sets out a number of policies in areas such as housing, industry and transport;

- **Policy TR1 Public Transport:** The Department will seek to ensure the development of a high quality public transport system accessible to all.
- **Policy TR 2 Traffic Management/Bus Measures**: The Department will seek to encourage public transport usage by according priority to bus movements where practicable.
- **Policy TR3 Cycling:** The Department will seek to increase cycle activity and provide safe facilities for cyclists.
- **Policy TR 5 Car Parking Provision in New Developments**: Car parking provision in new developments will be controlled on a zonal basis as follows:
    - Zone A - the Commercial Core, in which only operational car parking (servicing and other essential operations) will normally be permitted.
    - Zone B - the remainder of the Central Area and areas of mixed use elsewhere in the urban area, in which both operational and non-operational car parking will be required as determined by the Department.
    - Zone C - all other areas in which full operational and non-operational car parking will normally be required.
- **Policy IND 1 Assessment of Industrial Proposals:** The Department will consider the scale of the development, any impact on amenity, heritage or nature conservation interest, the design and layout of the scheme, and whether the proposal is appropriate to the character of the area or settlement. The Department will require that all industrial development is carried out to the highest design standards including the provision of access and car parking arrangements.
- **Policy IND 4 Environmental Impact:** In considering planning applications for new industrial development, the potential impact on the environment will be assessed.

7 Local Transport Plans and Strategies

Sub-Regional Transport Plan

The Sub-Regional Transport Plan 2015 (SRTP) was developed following the guidance of the Regional Development Strategy and the Regional Transport Strategy. Its purpose is to provide more detailed plans for the urban and rural areas with the Sub-Region and highlights proposals specifically designed for Londonderry. The package of schemes needed to incorporate current and future transport needs and be flexible to accommodate future Government policy.

The SRTP identified separate packages of measures for walking and cycling, bus, rail and highways. These will be subject to availability of land and financial resources and relevant statutory procedures such as planning guidance.

- **Walking** – proposals include: the provision of a continuous pedestrian network, designed and maintained to an appropriate standard and the in-fill of gaps in rural networks, footpaths which accommodate more easily buggies and mobility aids, additional crossing facilities with consideration to traffic flow and safety, upgrades to the existing pedestrian network from town centres to bus and rail stations. Traffic claming measures to facilitate crossing in rural areas. Provision of pedestrian links in new developments to the urban centres.

- **Cycling** – proposals include: networks of cycling routes taking into consideration existing road widths and physical constraints of route sharing, cycling parking at rail and bus stations.

- **Highway Measures** – town centres need to include traffic measures to lessen the forecast increase in traffic flows, reduction of bottlenecks at junctions, re-direction of traffic away from high-pedestrian flow areas. This may include new roads to new development areas which may be financed by the developer if the need is directly consequential to the new development, and /or new roads to reduce congestion in town centres or other sensitive areas.

- **Parking Measures** – provision of short term car parking close to town centres with long stay parking sited further from urban centres, additional provision for blue badge holders, taxi ranks and loading bays, convenience to bus and rail stations.

- **Public Transport Measures** – upgrade number of bus stops in town centres and well used routes from housing centres, improved accessibility for wheelchairs and buggies with low floor buses and better access to rail stations and platforms, bus priority for bus services especially at entry / exit of stations, the refurbishment or new bus and rail stations, if necessary, with disability parking to improve use. Additional taxi ranks with at least one on-street rank wherever practicable. In rural areas every settlement to have at least two modern stops with information on services, a canopy and close access to safe crossing if possible and may require the extension of routes into previously un-serviced settlements. The provision of Demand Responsive Services for mobility impaired residents in rural areas.

The improvement of the highways network through link road provisions is considered to lead to the improvement of air quality as adjacent roads would be relieved of traffic flow but may lead to dispersion over a wider area leading to diffuse worsening of air quality. Widening and junction improvements would reduce congestion and improve air quality on these roads and immediately adjacent roads.

Specifically for Derry-Londonderry there is limited provision of rail services to Belfast and there are no current plans to improve service provision. The co-ordinated bus service is inconvenient for the town centre so commuters have spilled into residential areas for free, unrestricted parking. A commuter coach service running between Derry and Belfast has proved very popular and taxi provision is good. The current problem for Derry is the increasing traffic flow, fuel tourism from the Republic of Ireland and long delays at junctions to the north of the City which have lead to worsening air quality. The Derry Local Transport Study looked at the limitations of the transport network in 2006 and proposed measures to improve transport and air quality. These were further outlined in the Derry Area Plan.

Derry Area Plan 2011

The Derry Area Plan 2011 outlined transportation needs in the immediate future in Derry City and the wider Derry-Londonderry district. The strategy of the Regional Transport Plan seeks to:

- encourage the use of alternative transport modes and reduce dependency on the private car;
- encourage accessible, reliable and popular public transport;
- maximise the efficiency of the existing transport network through review and implementation of low cost improvements;
- the development of appropriate road networks especially with regard to new industrial and housing developments;
- Implement road works focusing on improvement and upgrading of key strategic routes; and
- Improve pedestrian links in the area.

Specific policies for the region are:

- **Policy TR 1: Public Transport** – supporting developments in public transport by local operators to take advantage of improvements to the road network.
- **Policy TR 2: Traffic Measures and Bus Measures** – bus priority measures will be considered in association with traffic management measures and may include bus priority signals and bus lanes along the Core Public Transport Route.
- **Policy TR 3: Improve cycling** facilities and encourage cycling – by the development of a national Cycle Network, the implementation of a Riverside Strategy, new cycle routes, integration of cycling in new housing developments were possible, safe routes to school initiatives, and provision of cycle facilities.
- **Policy TR 4**: Access to Main Traffic Routes
- **Policy TR 5: Car parking provision in new developments** taking into consideration existing provision – zone A (commercial) in which operational parking would be permitted, Zone B (central and mixed use developments) operational and no-operational parking would be permitted, Zone C (all other areas) in which full operational and non-operational parking would be permitted.

- **Proposal TR 1:** Strategic Highway Proposals include the recommendations of the Derry Transportation Study and include the following schemes:
    - Strand Road widening – now complete;
    - Culmore Road widening;
    - Queens Quay widening;
    - Buncrana Road widening;
    - Glendermott Road and Dungiven Road widening;
    - Skeoge Link Road;
    - Crescent Link dualling;
    - Maydown to Broadbridge dualling;
    - Culmore Road improvements.

Local strategies for transportation are included in the Action Plan, specifically the following Measures:

- M1 to restrict the number of HGV vehicles on Creggan Road;
- M2 a targeted Travel Plan to promote alternatives to private car travel;
- M3, a car-sharing scheme in association with DRD Roads Service (NI), Travelwise Group and Donegal; and
- M25 and M16, to encourage cycling through the creation of a Cycling Forum.

Integrated Transport Strategy

The Urban Regeneration Company, ILEX-URC, was established to promote the physical, economic and social regeneration of the city with specific responsibility to manage and re-develop two former military bases of Ebrington (26 acres) and Fort George (14 acres).

ILEX-URC, as a lead partner in a steering group, commissioned the development of an Integrated Transport Strategy (ITS) for the Derry-Londonderry City region. The Steering Group was formed by an appointed transport planning consultancy with members including ILEX-URC, Derry City Council, Donegal CC, Londonderry Chamber of Commerce, Department of Social Development, North West Regeneration Office, DoE Planning Service, Department of Regional Development Roads Service, Translink and Sustrans. The remit of the group was to prepare the

ITS, giving consideration to all modes of transport, integrated with land-use and regeneration for the city and city region including cross-border. The draft ITS was published in April 2009.

In February 2009 ILEX facilitated a Future Search visioning exercise with a representative cross section of our community with varied resources, expertise and formal authority to have a respectful and meaningful conversation about our past, our present and our future. 120 people from the City, the region and other parts of Northern Ireland worked together, to agree a single, shared vision and a set of clear regeneration objectives and priorities for the City. This led to the formation of 12 Sector Working Groups to look at common areas going forward with the development of a Regeneration Plan entitled 'the One Plan' for the City and its region area. These included:

- Education& Skills;
- Marketing the Derry Opportunity;
- Development of City Region Assets;
- Children and Young People;
- Successful Neighbourhoods;
- River Asset;
- Enterprise and Employment;
- Health and Well Being;
- Environment & Conservation;
- Citizenship and Civic Pride;
- Transport and Infrastructure; and
- Tourism, Arts, Culture and Leisure.

The sector working group on Transport and Infrastructure reviewed the ITS in the context of the proposed Regeneration Plan and identified the following priorities:

- Reduce congestion and reliance on the private car;
- Create an integrated public transport system;

- Promote safe and sustainable modes of transport; and
- Enhance access and connectivity to, from and within the region.

The Regeneration Plan, launched on 24 June 2011, makes the following recommendations:

"As part of an overarching Integrated Transport Strategy a number of major projects have been proposed to create a fully integrated transport network. To ensure that there is an effective and efficient transport system operating it is essential that all of the elements of the strategy are implemented, one element will provide minor improvements but it is only through a co-ordinated approach that all elements will be implemented and real transformational changes to the network are achieved that will help target issues of accessibility"

The key projects are:

- Quality Bus Corridors (QBCs) and Feeder Taxi Services;
- Upgrade of the Rail Line and Rolling Stock;
- Upgrade of the A5 and A6 (to include the Atlantic Corridor);
- Orbital Link with the 3rd Road Bridge; and
- Implementation of Walking and Cycling Masterplan.

One of the key objectives of the strategy is to achieve a modal shift from the private car to other forms of transport. By offering a fully integrated network people have more attractive and efficient modes of travel to chose from and are less likely to rely on private transport and align with the City's commitment to sustainability."

The above proposals are a mixture of short, medium and long term objectives. Benefits to the AQMAs (existing and proposed) are difficult to assess but expected outcomes from their implementation will include:

- Improved Public Transport;

- The proposed orbital route will remove HDV traffic from the city centre and congested areas associated with the AQMA;
- Travel across the City will be more efficient and less congested; and
- Increased use of cycling and walking.

The proposed steps are City wide proposals and will not negate the need to take other specific measures already mentioned in the Air Quality Action Plan.

8 Climate Change Strategies

The Northern Ireland Climate Change Impacts Partnership (NICCIP) was established following the release of the 2007 DOE/Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) report “Preparing for Climate Change in Northern Ireland”. The NICCIP membership includes business, voluntary and government sectors to widen knowledge and impacts of climate change in Northern Ireland. It promotes adaptation of business and society to climate change and the development of discussion and ideas for the possibility and relevance of mitigation measures and cross-community strategies. The NICCIP produces a regular newsletter and is in the process of compiling a web-based list of contacts in Northern Ireland. It has also published “Climate Change: what will you do?” which is the findings of a survey of people, politicians and key decision makers.

The SNIFFER report on climate change addressed the two key challenges: to reduce emissions and to mitigate emissions. It outlined the likely future impacts on rain, soil moisture, weather patterns and wind speeds and sea level. It also outlined the impacts of climate change on:

- Biodiversity;
- Agriculture;
- Forestry;
- Fisheries;
- Water resources;
- Coastal and flood risk;
- Buildings, construction and planning;
- Economic infrastructure – business, insurance, transport, tourism and energy; and
- Social wellbeing – health, sport and recreation.

The report recommended a multi-party approach to adapt to the climate change through the assessment of adaptive capacity and the delivery of adaptive actions:

Adaptive Capacity

- Increasing awareness, training and knowledge;
- Contribute to the development and use of climate change, and socio-economic scenarios;
- Review the regulatory and legislative frameworks with respect to climate change and the provision of incentives for adaptation;
- Contingency/ emergency planning;
- Incorporation of climate change into models, and impacts and adaptations into scheme –specific assessments; and
- Consideration of cross-sector implications of responses.

Delivery of Adaptive Actions

- Increasing resilience through diversification and buffer zones;
- Avoidance of losses (e.g. altering building materials) and the acceptance of unavoidable losses;
- Embracing changes through maximising opportunities, and exploiting new opportunities e.g. forestry management;
- Planning for risks and opportunities in new infrastructure projects (e.g. transport and construction);
- Changes to management practices to accommodate climate change;
- Managing heat gain, energy use and water and environmental deficiencies in building design and construction; and
- Enhance health surveillance and responses to heat waves.

9 Implementation of Action Plans

The Council is currently amending its Air Quality Action Plan (AQAP) to incorporate additional measures at the two additional AQMAs at Spencer Road and Strand Road. The Council is also planning to remodel all AQMAs to take account of revised, more accurate traffic data. Previous data may have been over-conservative in that some traffic volumes have decreased rather than increased. Some of the AQMAs are marginally exceeding the annual mean AQS objective for NO_2 and remodelling could potentially result in revocation of AQMAs. An update of the revised AQAP will be provided in the next round of Review and Assessment.

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

Air quality within the existing AQMAs continued to exceed the annual mean AQS objective for NO_2 in 2012. It is recommended to continue to monitor within the AQMAs and surrounding areas. Including Abercorn Road, where a previous Detailed Assessment concluded that an AQMA was not required. Derry City Council will review the requirement for a further Detailed Assessment based on the 2013 monitoring results.

10.2 Conclusions relating to New Local Developments

Air quality from new developments will continue to be monitored in the borough. There is currently no need to carry out a Detailed Assessment at this time as a result of any new developments.

10.3 Other Conclusions

The Council should continue to develop the Air Quality Action Plan to include the new AQMAs in Strand Road and Spencer Road.

10.4 Proposed Actions

Proposed actions based up findings in this assessment are;

- Continue to monitor within and around the AQMAs;
- Finalise the Air Quality Action Plan; and
- Proceed to the Annual Progress Report 2014.

11 References

- Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- Derry City Council 2009 Updating and Screening Assessment
- Derry City Council 2011 Local Air Quality Management Annual Progress Report
- Derry City Council 2012 Updating and Screening Assessment

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Appendix B – Diffusion Tube Monitoring Results

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Diffusion tubes in 2012 were prepared and analysed by Environmental Scientifics Groups (ESG). The tube preparation is 50% TEA in water.

The national bias adjustment factor from sheet v03_13 is 0.84 for 2012.

Factor from Local Co-location Studies

Three local co-location studies have been undertaken in Derry at the Brooke Park AURN, Marlborough Street and the Dale's Corner automatic sites. Calculations of the local bias adjustment factors are presented below.

Brooke Park AURN co-location

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	04/01/2012	01/02/2012	21.0	21.0	23.0	22	1.2	5	2.9
2	01/02/2012	29/02/2012							
3	29/02/2012	28/03/2012	23.0	24.0	22.0	23	1.0	4	2.5
4	28/03/2012	25/04/2012	16.0	17.0	18.0	17	1.0	6	2.5
5	25/04/2012	30/05/2012							
6	30/05/2012	27/06/2012	12.0	11.0	17.0	13	3.2	24	8.0
7	27/06/2012	01/08/2012	10.0	10.0	10.0	10	0.0	0	0.0
8	01/08/2012	29/08/2012	13.0	13.0	14.0	13	0.6	4	1.4
9	29/08/2012	26/09/2012	13.0	13.0	15.0	14	1.2	8	2.9
10	26/09/2012	31/10/2012	22.0	22.0	23.0	22	0.6	3	1.4
11	31/10/2012	28/11/2012	23.0	26.0	24.0	24	1.5	6	3.8
12	28/11/2012	02/01/2012	65.0	75.0	79.0	73	7.2	10	17.9
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
17.3	99.9	Good	Good
19.0	96.6		Good
18.8	100.0	Good	Good
12.9	99.9	Good	Good
11.2	99.9		Good
11.0	99.7	Poor Precision	Good
8.8	99.9	Good	Good
9.2	96.0	Good	Good
9.5	99.7	Good	Good
17.1	99.8	Good	Good
19.8	99.9	Good	Good
26.2	95.7	Good	Good
Overall survey -->		Good precision	Good Overall DC

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 9 out of 10 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%

Bias calculated using 9 periods of data

Bias factor A: 0.64 (0.51 - 0.85)

Bias B: 56% (17% - 95%)

Diffusion Tubes Mean: 24 µgm^{-3}

Mean CV (Precision): 5

Automatic Mean: 16 µgm^{-3}

Data Capture for periods used: 99%

Adjusted Tubes Mean: 16 (12 - 21) µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA

Bias calculated using 10 periods of data

Bias factor A: 0.65 (0.53 - 0.84)

Bias B: 54% (19% - 88%)

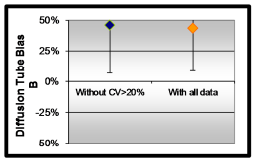
Diffusion Tubes Mean: 23 µgm^{-3}

Mean CV (Precision): 7

Automatic Mean: 15 µgm^{-3}

Data Capture for periods used: 99%

Adjusted Tubes Mean: 15 (12 - 19) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Marlborough Street AURN co-location

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	04/01/2012	01/02/2012	87.0	87.0	90.0	88	1.7	2	4.3	71.2	98.2	Good	Good
2	01/02/2012	29/02/2012	77.0	82.0	77.0	79	2.9	4	7.2	76.6	92.3	Good	Good
3	29/02/2012	28/03/2012	74.0	81.0	71.0	75	5.1	7	12.7	75.0	98.1	Good	Good
4	28/03/2012	25/04/2012	54.0	54.0	48.0	52	3.5	7	8.6	60.1	95.4	Good	Good
5	25/04/2012	30/05/2012	66.0	71.0	66.0	68	2.9	4	7.2	48.5	95.7	Good	Good
6	30/05/2012	27/06/2012	62.0	52.0	63.0	59	6.1	10	15.1	53.3	95.7	Good	Good
7	27/06/2012	01/08/2012	47.0	49.0	51.0	49	2.0	4	5.0	52.7	97.7	Good	Good
8	01/08/2012	29/08/2012								44.0	95.7		Good
9	29/08/2012	26/09/2012	21.0	56.0	65.0	47	23.2	49	57.7	62.9	99.0	Poor Precision	Good
10	26/09/2012	31/10/2012	72.0	67.0	71.0	70	2.6	4	6.6	67.2	98.0	Good	Good
11	31/10/2012	28/11/2012	83.0	73.0	88.0	81	7.6	9	19.0	74.2	97.0	Good	Good
12	28/11/2012	02/01/2012	24.0	25.0	24.0	24	0.6	2	1.4	79.4	91.0	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision | Good Overall DC

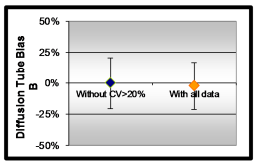
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 10 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 10 periods of data	
Bias factor A	1.02 (0.84 - 1.29)
Bias B	-2% (-22% - 19%)
Diffusion Tubes Mean:	65 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	66 μgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	66 (54 - 83) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	1.04 (0.87 - 1.3)
Bias B	-4% (-23% - 15%)
Diffusion Tubes Mean:	63 μgm^{-3}
Mean CV (Precision):	9
Automatic Mean:	66 μgm^{-3}
Data Capture for periods used:	96%
Adjusted Tubes Mean:	65 (55 - 82) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Dale's Corner AURN co-location

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	04/01/2012	01/02/2012	39.0	39.0	33.0	37	3.5	9	8.6	31.6	99.9	Good	Good
2	01/02/2012	29/02/2012	44.0	39.0	43.0	42	2.6	6	6.6	37.9	87.2	Good	Good
3	29/02/2012	28/03/2012	46.0	44.0	42.0	44	2.0	5	5.0	37.2	57.6	Good	or Data Capture
4	28/03/2012	25/04/2012	41.0	35.0	43.0	40	4.2	10	10.3	35.1	71.1	Good	or Data Capture
5	25/04/2012	30/05/2012	40.0	39.0	36.0	38	2.1	5	5.2	32.8	95.5	Good	Good
6	30/05/2012	27/06/2012	30.0	29.0	37.0	32	4.4	14	10.8	31.2	98.8	Good	Good
7	27/06/2012	01/08/2012	25.0	31.0	28.0	28	3.0	11	7.5	24.6	99.2	Good	Good
8	01/08/2012	29/08/2012	35.0	33.0	30.0	33	2.5	8	6.3	27.6	95.5	Good	Good
9	29/08/2012	26/09/2012	26.0	26.0	28.0	27	1.2	4	2.9	25.6	100.0	Good	Good
10	26/09/2012	31/10/2012	46.0	48.0	46.0	47	1.2	2	2.9	40.3	99.8	Good	Good
11	31/10/2012	28/11/2012	42.0	41.0	47.0	43	3.2	7	8.0	44.0	100.0	Good	Good
12	28/11/2012	02/01/2012	45.0	50.0	49.0	48	2.6	6	6.6	48.1	95.7	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey --> Good precision | Good Overall DC

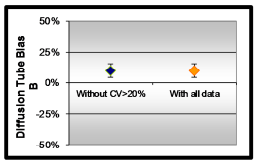
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:

Precision: 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 10 periods of data	
Bias factor A	0.92 (0.87 - 0.97)
Bias B	9% (3% - 14%)
Diffusion Tubes Mean:	37 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	34 μgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	34 (33 - 36) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 10 periods of data	
Bias factor A	0.92 (0.87 - 0.97)
Bias B	9% (3% - 14%)
Diffusion Tubes Mean:	37 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	34 μgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	34 (33 - 36) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

A factor of 0.86 is derived by averaging the result from all three co-location studies.

Location	Local Bias Adjustment Factor
Brooke Park AURN	0.64
Dale's Corner	0.92
Marlborough Street	1.02
Average	0.86

Discussion of Choice of Factor to Use

The use of bias adjustment factors over the past few years has varied and both national and local have been used. A summary of factors used since 2007 is provided below.

Year	Local or National	Bias adjustment factors
2007	National	0.88
2008	Local	1.00
2009	Local	0.93
2010	Local	0.99
2011	Local	0.90
2012	Local	0.86

For the 2012 data a factor of 0.86 from the local bias adjustment spread sheet has been used as this factor provides a slightly more conservative approach than the data from the national bias adjustment sheet.

PM Monitoring Adjustment

No adjustment to the PM_{10} monitoring data was required.

Short-Term to Long-term Data Adjustment

Diffusion tube data with less than 9 months of recorded data was annualised using background continuous data from two sites (Derry Brooke Park, AURN site and Belfast Urban Background AURN site). LAQM TG (09) Box 3.2 recommends the use

of three or more background sites when annualising data, however due to a limited number of monitoring sites in Northern Ireland only two sites were available. The results of the annualisation are provided below.

Site	Uncorrected Diffusion Tube Mean (µg/m^3)	Annuali-sation Factor Brooke Park	Annuali-sation Factor Belfast	Average Annualisation Factor	Annualised Bias Adjusted Concentration (µg/m^3)
AB3	34.0	0.90	0.85	0.87	25.5
AB4	34.0	0.90	0.85	0.87	25.5
AB5	27.8	0.90	0.85	0.87	20.8
AB6	27.3	1.07	0.95	1.01	23.6
AB7	29.6	0.90	0.85	0.87	22.2
AB8	25.0	0.90	0.85	0.87	18.7
JS3	39.9	1.04	1.00	1.02	35.0
S1	27.0	1.22	1.24	1.23	28.6
S2	25.4	1.22	1.24	1.23	26.9
RC1	21.6	1.00	1.12	1.06	19.7
RC2	21.7	1.05	1.15	1.10	20.5
RC3	26.7	1.05	1.15	1.10	25.2
GL1	19.6	1.09	1.15	1.12	18.9
GL2	18.3	1.09	1.15	1.12	17.6
GL3	20.4	1.09	1.15	1.12	19.7
FR 1	51.7	0.58	0.61	0.60	26.5
FR 3	51.0	0.58	0.61	0.60	26.1
FR 4	50.0	0.58	0.61	0.60	25.6

Data for PM_{10} monitored at the Brooke Park AURN site was below 75% data capture in 2012. This data was annualised using Belfast AURN site and Lough Navar AURN site. The results are provided below.

Site	Uncorrected Diffusion Tube Mean (µg/m^3)	Annualisation Factor Belfast	Annualisation Factor Lough Navar	Average Annualisation factor	Annualised Bias Adjusted Concentration (µg/m^3)
Brooke Park AURN	17.07	1.05	1.10	1.07	18.35

QA/QC of Automatic Monitoring

The sites are managed to the UK Automatic Urban and Rural Network (AURN) QA procedures and standard.

AEA Energy and Environment undertake the Quality Assurance/Quality Control (QA/QC) procedures at the three monitoring sites, ensuring that measurements from the analysers are as accurate as possible, and that measurements recorded at each site can be compared with other sites.

Manual calibration of automatic monitors is undertaken every two weeks by the Council's officers. This allows the instrument drifts to be fully quantified and documented using traceable calibration gas standards and the results are used to scale data.

The analysers are checked and serviced every six months by the appointed equipment support contractors. The reports are then sent to AEA.

QA/QC of Diffusion Tube Monitoring

ESG participates in the Workplace Analysis Scheme for Proficiency (WASP), which is an independent analytical performance testing scheme.

According to the summary of laboratory precision published by the LAQM Helpdesk, tubes analysed by ESG displayed 'Good' precision in 4 out of 5 studies in 2012 (based on spreadsheet version 03/13).

Appendix B – Diffusion Tube Monitoring Results

Site Ref	Address	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
A1	AURN	21		23	16		12	10	13	13	22	23	65
A2	AURN	21		24	17		11	10	13	13	22	26	75
A3	AURN	23		22	18		17	10	14	15	23	24	79
C1	3 Creggan Rd	86	78	88	69	66	61	58	64	62	23	90	77
C2	3 Creggan Rd	84	85	89	66	62	57	60	66	75	91	88	84
C3	6 Marlborough Terrace	44	40	46	51	38	37	33	30	53	79	51	56
C4	6 Marlborough Terrace	48	43	48	46	41	38	35		43	52	52	46
NA...S1	2 Marlbourough Street	87	77	74	54	66	62	47		21	72	83	24
NA...S2	2 Marlbourough Street	87	82	81	54	71	52	49		56	67	73	25
NA...S3	2 Marlbourough Street	90	77	71	48	66	63	51		65	71	88	24
C5	22A Creggan Street	53	54	57	47	40	43	37	43	51	56	56	
C6	22A Creggan Street	51	55	59		46	38	43	39	48	51	55	
C7	1 Windsor Terrace	30	32	29	23	22		21	21	18	33	33	32
C8	1 Windsor Terrace	30	33	29	25	22		21	21	25	30	32	34
C9	14 Creggan Road	44	50	49	72	56	64	47	49	37	68	47	62
C10	14 Creggan Road	43	51	62	70	63	64	46	50	37	66	47	48
D1	Continuous Monitor	39	44	46	41	40	30	25	35	26	46	42	45
D2	Continuous Monitor	39	39	44	35	39	29	31	33	26	48	41	50
D3	Continuous Monitor	33	43	42	43	36	37	28	30	28	46	47	49
D4	52 Clooney Terrace	27	31	35	39	10	38	24	30	19	43	36	39
D5	52 Clooney Terrace	31	26	32	36			24	33	22	39	31	45
D6	5 Glendermott Road	53	59	53	76	64	62	51	52	50	71	60	76
D7	5 Glendermott Road	54	52	49	2	103	62	55	50	49	60	61	70
D8	19 Glendermott Road	53	60	53	80	76	32	65	60	50	78	63	56
D9	19 Glendermott Road	55	51	59	90	75	34	64	62	51	84	65	70
D10	4 Ebrington Terrace	61	2	119	69	69	28	51	64	45	73	60	77

Site Ref	Address	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
D11	4 Ebrington Terrace	61	62	64	70	61	26	80	60	50	62	64	71
D12	12 Ebrington Terrace	42	28	35.4	42	46	19	36	41	41	54	53	58
D13	12 Ebrington Terrace	44	32	34	46	47	16	36	42	35	56	51	53
D14	9 Columba Terrace	43	56	48	36	31	10	26	32	30	46	52	56
D15	9 Columba Terrace	41	60	43	34	30	12	25	31	30	41	47	50
D16	17 Melrose Terrace	49	42	46	40	38	15	29	28	27	46	38	45
D17	17 Melrose Terrace	35	43	45	36	33	18	31	30	29	50	47	51
P1	53 Messines Park	29	30	32	19	24	7	16	18	19	32	30	38
P2	53 Messines Park	30	32	30	19	23	9	16	22	19	30	33	41
P3	57 Messines Park	28	36	33	36	35	13	25	29	24	43	37	41
P4	57 Messines Park	31	37	33	33	32	14	29	27	37	42	35	41
P5	8 Maybrook Terrace	28	30	27	34	33	16	26	28	29	51	37	39
P6	8 Maybrook Terrace	31	30	27	33	34	15	28	26	20	52	34	45
P7	19 St Patricks Terrace	33	36	30	49	42	19	34	37	35	54	40	48
P8	19 St Patricks Terrace	36	36	30	45	46	22	33	37	29	54	44	53
P9	1 Collon Terrace	43	43	36	42	38	16	34	33	38	43	49	53
P10	1 Collon Terrace	43	42	39	43	34	16	34	31	40	51	45	54
P11	5 Collon Terrace	57	50	46	43	42	15	38	38	49	60	63	65
P12	5 Collon Terrace	52	40	48	47	37	16	38	39	47	54	64	64
S1	99 Strand Road	41	44	47	51	43	18	40	33	41	56	54	62
S2	99 Strand Road	41	48	44	50	39	5	39	34	43	54	54	60
S3	Rockmills	41	39	50	29	27	2	31	33	28	38	42	42
S4	Rockmills	40	45	51	30	31	3	28	30	35	42	44	57
AB1	63 Abercorn Road	51	57	64	44	41	16	36	38	43	41	54	81
AB2	63 Abercorn Road	56	51	57	46	43	14.1	34	38	46	43	64	69
AB3	65 Abercorn Road								24	26	39	33	48
AB4	65 Abercorn Road								23	25	36	36	50

Site Ref	Address	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
AB5	67 Abercorn Road								18	27	36	28	30
AB6	67Abercorn Road								20	28	35	26	
AB7	115 Bishop Street								19	25	34	31	39
AB8	115 Bishop Street								18	25	16	31	35
JS1	10 John St	36	43	42	39	37		55	36	32	28	47	
JS2	10 John St	38	40	44	39	35	1	51	35	32	42	46	
JS3	12 John St				41	42		66	38	29	48	33	22
JS4	12 John St	34	33	38	49			65	35	29	44	33	22
SP1	70 Spencer Road	47	46	51	50	25	20	38	39	42	60	55	60
SP2	70 Spencer Road	46	51	55	48	26	19	38	42	42	55	53	58
NB...S1	17 The Branch		34	34	22	25	26	19	35	21			
NB...S2	17 The Branch		33	34	20	25	24	18	30	19			
RC1	76 Racecourse Road	21	21	26	20			20					
RC2	1 Castleview Park	21	29	28	19		11	22					
RC3	31 Balmoral Ave	28	36	38	26		10	22					
GL1	38 Glengalliagh Park	28	26	29	19	7	6	22					
GL2	38 Glengalliagh Park	19	21	26	18	8	7	29					
GL3	7 Capital Court	21	23	25	36	7	7	24					
FR 1	3 Francis Street												51.7
FR 3	45 Francis Street												51
FR 4	45 Francis Street												50