LISBURN
CITY COUNCIL

2014 Air Quality Progress Report for Lisburn City Council

In fulfillment of the Environment (Northern Ireland) Order 2002 - Local Air Quality Management

June 2014

Local Authority Officer	Sally Courtney Cheryl Harkness

Department	Environmental Services
Address	Island Civic Centre, The Island, Lisburn BT27 4RL
Telephone	02892509401
e-mail	Sally.Courtney@lisburn.gov.uk Cheryl.harkness@egehc.co.uk

Report Reference number	LCC 2014
Date	June 2014

Executive Summary

The Air Quality Strategy has established the framework for air quality management in the UK. Local Authorities have a duty under the Environment Act 1995 and subsequent regulations to review and assess air quality in their areas on a periodic basis so as to identify all areas where the air quality objectives are being or are likely to be exceeded. A phased approach has been adopted for the review and assessment process so that the level of assessment undertaken is commensurate with the risk of an exceedence of an air quality objective.
An updating and screening assessment (USA) is required to be prepared every three years by all local authorities in the UK. The last updating and screening assessment of air quality was undertaken in 2012 and the next is due by the end of April 2015, with two interim progress reports.

This report is the 2014 progress report and has been completed using the recommended template. The assessment is fully compliant with the applicable policy and technical guidance.

Lisburn city council is located southwest of Belfast and is the second largest Council in Northern Ireland, it covers 174square miles and has a population of over 121,000. Spanning parts of southwest County Antrim and Northwest County Down, the Council stretched from Glenavy and Dundrod in the north to Dromara and Hillsborough in the South, and from Drumbo in the east to Moira and Aghalee in the west.

The progress report identified no exceedences with relevant exposure, of the Air Quality Strategy objectives for 2013 for any of the pollutants assessed. No AQMA’s are currently declared in Lisburn City Council Area.

Table of contents

Appendices

Appendix A: QA/QC Data

List of Tables

List of Figures

1 Introduction

1.1 Description of Local Authority Area

Lisburn City Council covers an area totalling 174 square miles of southwest Antrim and northwest Down stretching from Glenavy and Dundrod in the north to Dromara and Hillsborough in the south, and from Drumbo in the east to Moira and Aghalee in the west. The population is approximately 121,000 and it is bounded by Belfast City Council, Craigavon Borough Council, Castlereagh Borough Council, Banbridge District Council Antrim Borough Council and Down District Council.

The major road network within the Lisburn consists of the M1 dissecting the Borough on its route from Belfast and bordering on Dunmurry, Lisburn and Moira.

The A1 takes a route out of Belfast through the centre of Dunmurry and Lisburn town. At Sprucefield it forms a junction with the M1 and then takes a route, bordering on Hillsborough, towards Dublin.

1.2 Purpose of Progress Report

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Northern Ireland are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (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 Local Air Quality Management in Northern Ireland.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	3.25 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM10) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Lisburn City Council has completed the following reviews and assessments of air quality in earlier rounds of the assessment process:

Stage 1 Report (LBC, 2000)	The first stage review and assessment found that the air quality objectives for 4 of the 7 specified parameters namely carbon monoxide, nitrogen dioxide, PM_{10} and sulphur dioxide were all unlikely to be achieved by 2003-2005.
Stage 2/3 Air Quality Review (LCC, 2003, 2004)	The stage 2/3 review for road emissions and domestic fuel combustion concluded that an Air Quality Management Area (AMQA) should not be declared for NO_2, PM_{10} and SO_2, as there were not predicted to be exceedences of the air quality objectives.
Progress report (LCC,2005)	This reported data for 2004.The progress report concluded that PM_{10}, NO_2 and SO_2 were not predicted to cause exceedences of the air quality objectives at relevant receptors.
Updating and Screening Assessment (USE, 2006)	This reported data for 2005. This indicated that current objectives in relation to SO_2, NO_2 and PM_{10} would be achieved at the location of the automatic monitoring stations.
Progress report (EG, 2007)	This reported the 2006 measurements
Progress report (EG, 2008)	This reported the 2007 measurements It continues to be the case that no current air quality objectives are being exceeded in the Lisburn City Council area. PAH levels are being monitored in Dunmurry as earlier studies have indicated elevated levels of this pollutant.
Updating and Screening Assessment (USA, 2009)	This reported 2008 measurements.
Progress Report (LCC,2010)	This reported 2009 measurements and all current objectives were achieved.
Progress Report (LCC,2011)	This reported 2010 measurements and all current objectives were achieved
Updating and Screening Assessment (USA, 2012)	This reported 2011 measurements, none of the pollutants monitored exceed the objective and a detailed assessment is not required.
Progress Report (LCC,2013)	This reported 2012 measurements and all current objectives were achieved

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

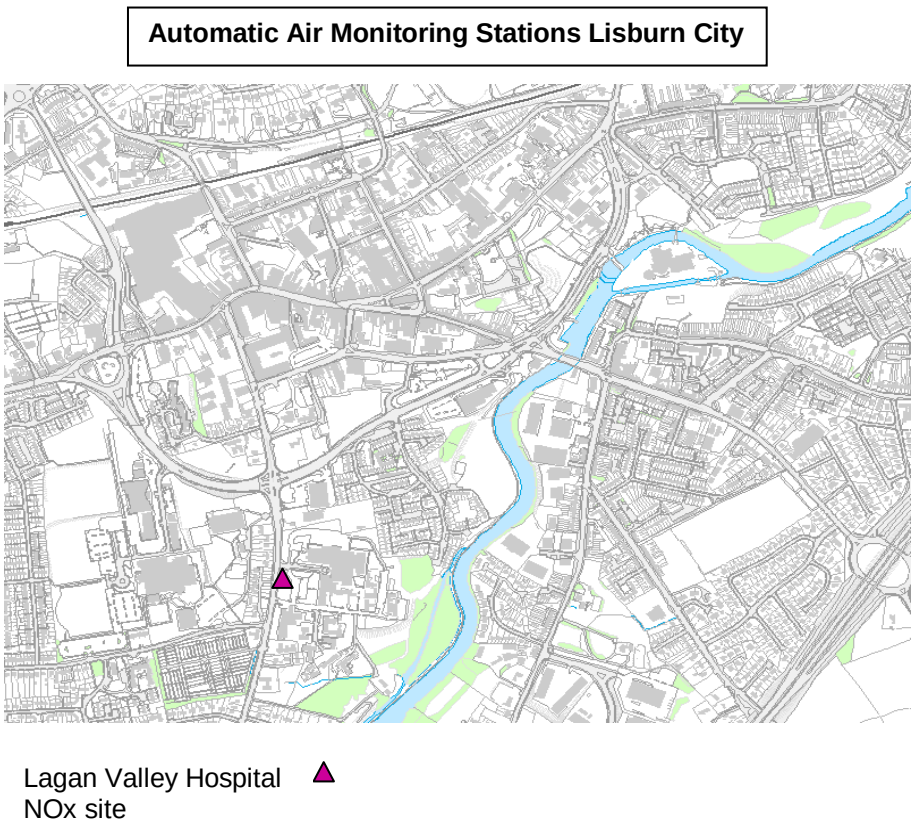
2.1.1 Automatic Monitoring Sites

Lisburn City Council monitored NOx using a chemiluminescence analyser at Lagan Valley Hospital. This site was decommissioned in July 2013 due to equipment failure and as levels had remained below the objective for a number of years it was felt sufficient data had been obtained. The last fully ratified data was obtained on 24th June 2013.
The Dunmurry High School site monitoring, SO_2, PM_{10} and $PM_{2.5}$, had to be urgently relocated in June 2012 due to the closure of the school.

A new site was identified close to the school at Kilmakee Activity Centre, this was found to be suitable to relocate all the analysers to Including the PAH and black carbon and therefore meeting the requirement for the AURN specifications.
This new site was not fully operational until 30th Sept 2012, and due to teething problems there was no reliable data available until Nov 2012. This site is now well established and the 2013 data is included in this report.

See Appendix A: Details of Quality Assurance and Quality Control

Figure 2.1 Map(s) of Automatic Monitoring Sites



(This site was decommissioned in July 2013)

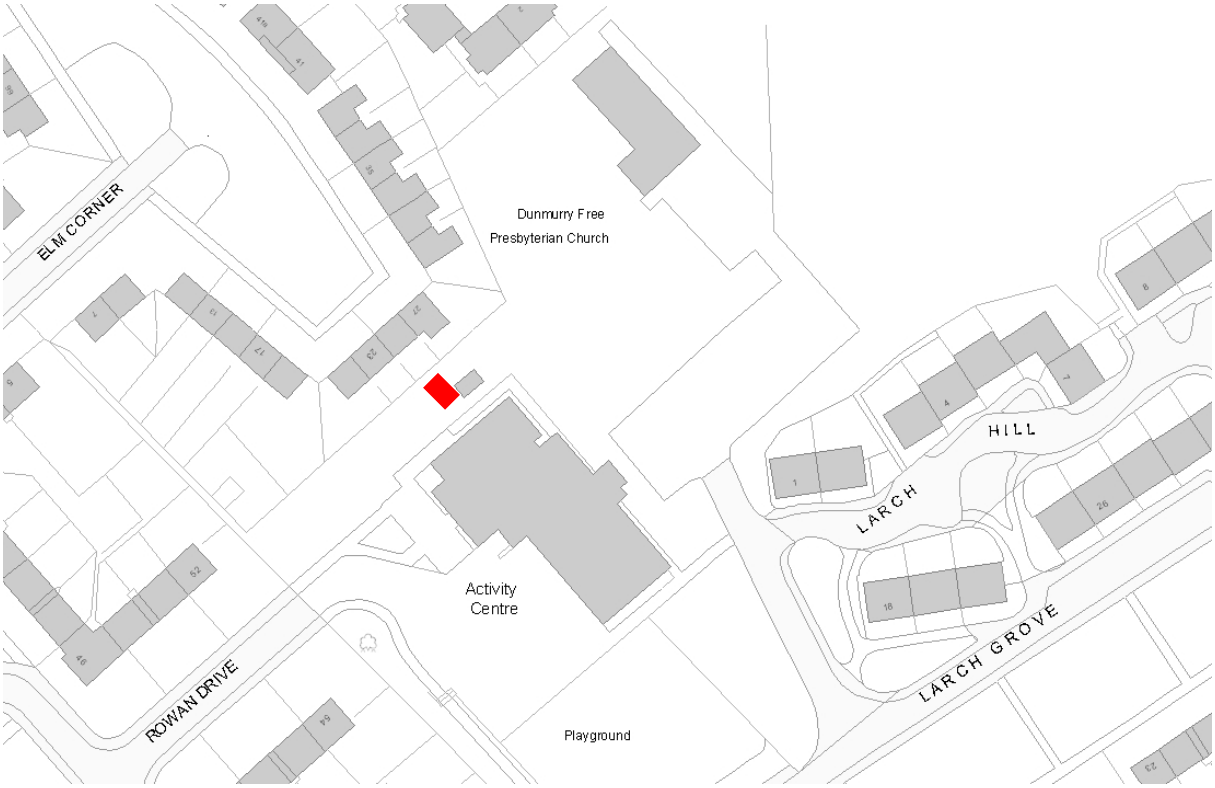
Air Monitoring Site Dunmurry High School

(site decommissioned 30th June 2012)

New site Kilmakee Activity Centre Dunmurry

▲ **New site Kilmakee**
▲ Decommissioned site Dunmurry High School

Position of new site Dunmurry (Kilmakee Activity Centre)



Position of new site

Enclosures at Kilmakee Activity Centre housing:
(SO_2,PM10,$PM_{2.5}$,Black Carbon and PAH monitors)

Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQ MA ?	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?
Dunmurry High School (a)	Urban Background	X328595	Y367325	PM10, PM2.5 SO2	TEOM FDMS UV Analyser	NO	YES 40M	50M	NO
Kilmakee Activity Centre (b)	Urban Background	X327	Y364	PM10, PM2.5 SO2	TEOM FDMS UV Analyser	NO	YES 10M	NA	YES
Lagan Valley Hospital (c)	Roadside	X326537	Y363700	NO2	chemiluminescence analyser	NO	YES 40M	5M	YES

(a)Dunmurry High School site was decommissioned on the 27th June 2012
(b) New site in Kilmakee Dunmurry
(c) Lagan Valley Hospital site was decommissioned in July 2013

2.1.2 Non-Automatic Monitoring

Lisburn City Council has maintained a number of NO_2 diffusion tubes at roadside and background sites for a number of years. The diffusion tube studies for Lisburn for the past five years do not show any particular trends. (See Fig. 2.4) Only the Northern Bank site and the Moira site showed results slightly exceeding the objective. However, these are historical kerb side sites without relevant exposure. The Northern Bank site was removed at the beginning of 2010 and re-located to Sloan Street adjacent to relevant exposure, and permission was obtained to move the Moira site to the nearest relevant exposure at the beginning of 2013 (new Main St Moira). There were also two historical background sites, one of these (Edgewater) was removed in 2011,and due to previous proposals to extend the Bentrim Road Tesco store, a new diffusion tube roadside site at Bentrim was identified and monitoring commenced in January 2012. Results show levels of NO_2 to be close to the objective at this site and therefore at the end of 2013 permission was gained to move this site onto the façade of the nearest relevant exposure. Also at the end of 2013 the Benford Park site was ceased, this was on the façade of a private dwelling and Lisburn City Council were unable to gain permission to continue with this site in 2014. The results from the Benford Park site had remained considerably below the objective, so identifying an alternative site at this location was not deemed necessary. Annual variation is more likely to be as a result of climatic conditions rather than changes in emissions. All other monitoring has shown results below the current objectives.

The NO_2 diffusion tubes are supplied Eurofins Public Analyst Scientific Services and analysed by ESG (Environmental Scientifics Group).
Further information on the QA/QC can be found in appendix A.

Figure 2.2 Map(s) of Non-Automatic Monitoring Sites

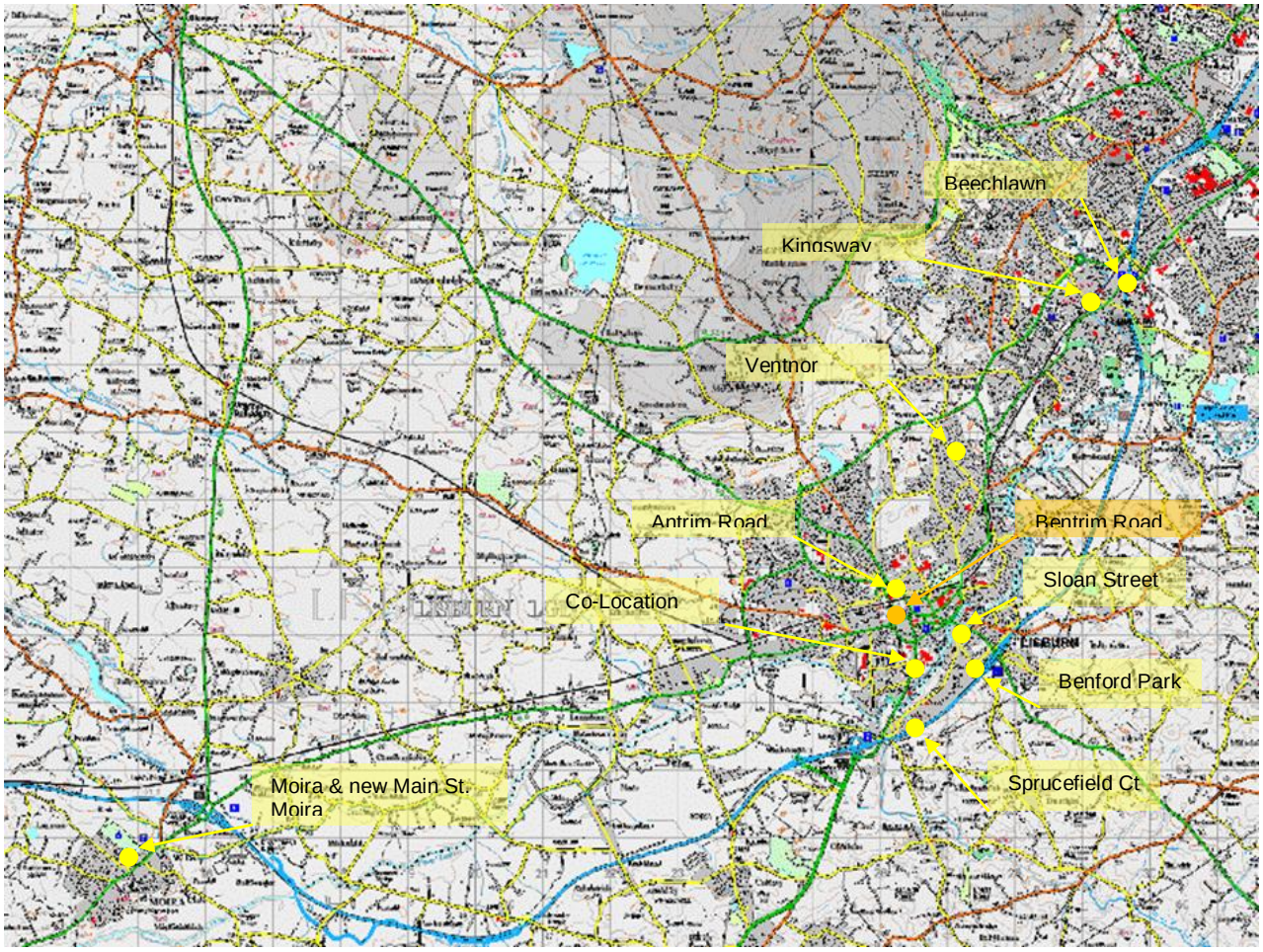


Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
Northern bank (removed 31st March 2010)	Roadside	326507	364415	NO_2	No	No	0.5m	No
Antrim Rd	Roadside	326313	364621	NO_2	No	Yes 7m	1m	Yes
Ventnor Pk	Background	326900	362013	NO_2	No	No	0.5m	No
Edgewater (ended Dec 2010)	Background	327202	363718	NO_2	No	No	0.5m	No
Moira	Roadside	315100	360621	NO_2	No	No	0.5m	Yes
(New) 58-62 Main Street Moira	Roadside	314994	360589	NO_2	No	Yes	1.5m	Yes
Kingsway	Roadside	329502	386915	NO_2	No	Yes 30m	1m	Yes
Lagan Valley Hospital	Co location	329610	369105	NO_2	No	Yes 40m	5m	Yes
Beechlawn	Roadside	326165	362491	NO_2	No	Yes 10m	1mm	Yes
Sprucefield Court	Roadside	327586	363586	NO_2	No	Yes 1m	15m	Yes
Benford Park	Roadside	326507	364415	NO_2	No	Yes 1m	15m	Yes
Sloan Street	Roadside	327236	364102	NO_2	No	Yes 4m	1.5m	Yes
Bentrim	Roadside	326090	364619	NO2	No	Yes 4m	1m	Yes

2.2 Comparison of Monitoring Results with Air Quality Objectives

No exceedences of the AQS objectives have been identified from the monitoring data collected since the last Update and Screening Assessment. All monitored pollutant concentrations have been well below their respective air quality objective limits at relevant exposure.

2.2.1 Nitrogen Dioxide

In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective. All sites meet the objective at relevant exposure.

Automatic Monitoring results

Table 2.3a presents the annual mean concentrations of NO_2 determined at the automatic site in 2013 from the hourly measurements.

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Automatic Monitoring Sites.

Results have been consistent since installation of the automatic station, there was a slight elevation in 2010 but this was more likely due to the severe climate conditions.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2013 % [b]	Annual Mean Concentration μg/m^3				
					2009	2010	2011	2012	2013
Lagan Valley Hospital	Roadside	N	99%	46.9%	25	33	28	24	**26.64(a)**

(a)as less than 75% of data available the data has been annualised - ie. adjusted using the methodology **in Box 3.2 of LAQM.TG(09)**

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring %[a]	Valid Data Capture 2013 % [b]	Number of Exceedences of Hourly Mean (200 μg/m^3)				
					2009	2010	2011	2012[c]	2013 [c]
Lagan Valley Hospital	Roadside	N	99%	46.9%	0	0	6	0 (99.8 percentile 124ug/m3)	1 (99.8 percentile 143ug/ m^{-3}m3)

[c] If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

2012 data capture 81.7%

2013 data capture 46.9%

Diffusion Tube Monitoring Data

Lisburn City Council has maintained a number of NO_2 diffusion tubes at roadside and background sites for a number of years. The diffusion tube studies for Lisburn for the past five years do not show any particular trends. Only the Northern Bank and Moira sites show exceedences above and close to the objective. However, these are historical kerb side sites without relevant exposure. The Northern bank site was removed at the beginning of 2010 and re-located to Sloan Street .A new site at relevant exposure was identified in Moira and monitoring commenced in 2013. The diffusion tube from the historical background site at Edgewater was removed at the end of 2010 . The Tesco store at Bentrim Road had previously proposed extending, so a new monitoring site was identified at Bentrim which commenced in January 2012. Annual variation is more likely to be as a result of climatic conditions rather than changes in emissions.

A co-location study was carried out at the Lagan Valley Hospital site, and its results included in the LAQM data base. This study was ceased in 2013 as the automatic site was decommissioned in 2013. Therefore the national bias adjustment factor ESG of **0.80** has been applied.

Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor **0.80** can be found in appendix A

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013 (Number of Months [a]	2013 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.75 [b]
	Antrim Road Lisburn	Roadside	N	N	12	26
	22 Ventnor Park Lambeg	Background	N	N	12	13
	(a).New Main Street Moira	Roadside	N	N	11	24
	18 Kingsway Dunmurry	Roadside	N	N	12	28
	10 Beechlawn Park Dunmurry	Roadside	N	N	12	25
	9 Sprucefield Court Lisburn	Roadside	N	N	12	37
	18 Benford Park Lisburn	Roadside	N	N	9	23
	Sloan Street	Roadside	N	N	12	28
	Bentrim Road	Roadside	N	N	9	37

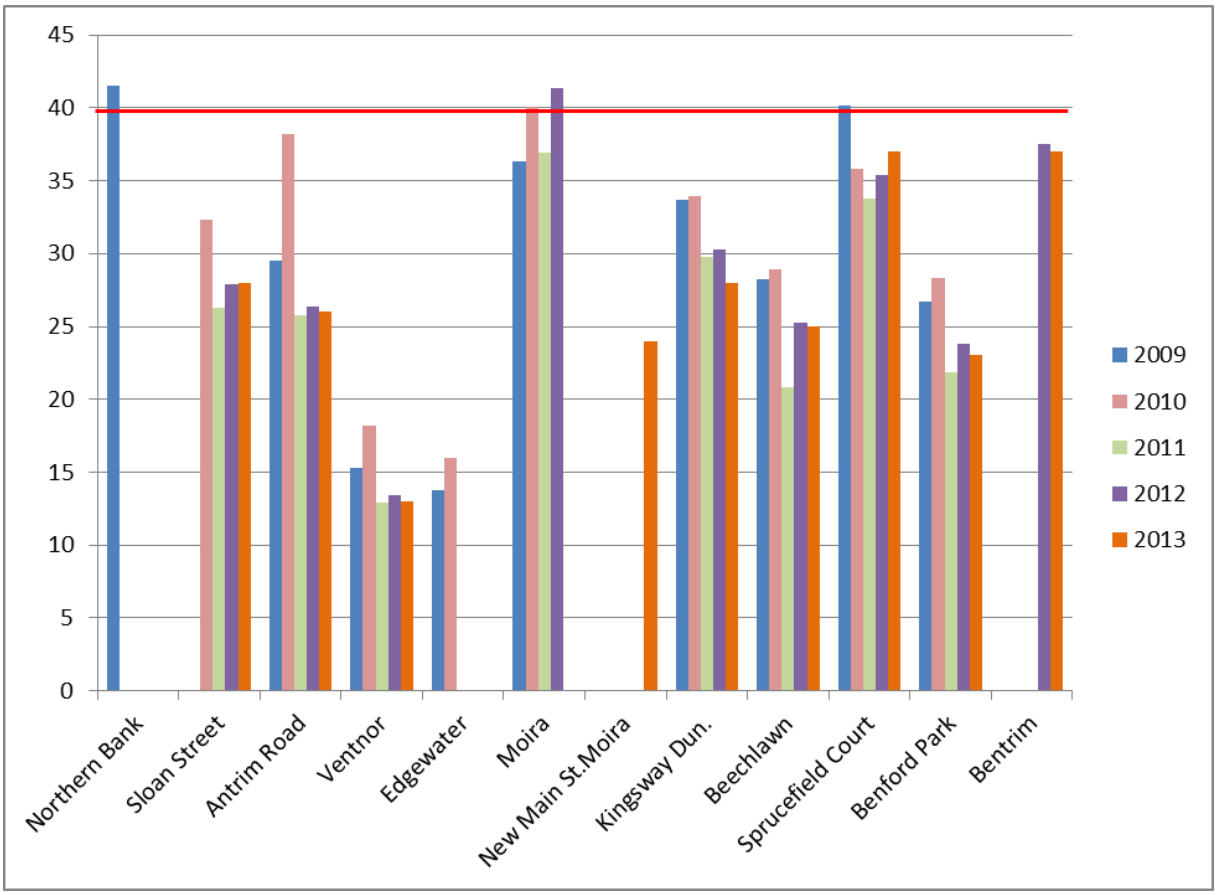
(a) New site identified in Moira at the closest relevant expose to the original site.

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2009 (Bias Adjustment Factor = 0.84)	2010 (Bias Adjustment Factor = 0.84)	2011 (Bias Adjustment Factor = 0.71)	2012 (Bias Adjustment Factor = 0.75)	2013 (Bias Adjustment Factor = 0.80)
Northern Bank (decommissioned end 2009)	Roadside	N	42				
Antrim Road Lisburn	Roadside	N	29	38	26	26	26
22 Ventnor Park Lambeg	Background	N	17	15	18	13	13
Main Street Moira	Roadside	N	36	40	37	**41(a)**	
new Main Street Moira	Roadside	N					24
18 Kingsway Dunmurry	Roadside	N	34	34	30	30	28
10 Beechlawn Park Dunmurry	Roadside	N	28	29	21	25	25
9 Sprucefield Court Lisburn	Roadside	N	40	36	34	35	37
18 Benford Park Lisburn	Roadside	N	27	28	22	24	23
Sloan Street	Roadside	N		32	26	28	28
Bentrim Road	Roadside	N				38	37

(a) The Moira site was slightly above the objective, the nearest relevant exposure was 150m further on the same Road . To use the NO_2 fall-off with distance calculator would not be relevant as the volume of traffic and distance from the road similar. Permission was granted to attached the diffusion tube to the façade of the nearest relevant exposure. This was carried out in January 2013, and identified at (new Main St. Moira).

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites.

NO_2 diffusion tube results have remained consistent any annual variation is more likely to be as a result of climatic conditions rather than changes in emissions.



2.2.2 PM_{10}

Automatic monitoring using an FDMS TEOM of PM10 in 2013 was undertaken at Kilmakee Activity Centre, Rowan Drive, Dunmurry in the Lisburn City Council area and ratified by AQDM.
Summaries of this data, with regard to annual and hourly mean objectives, are presented below.
Unfortunately Dunmurry High School site had to be relocated to the Kilmakee site due to the closure of the school in June 2012.
The data presented below is for the the new site at Kilmakee 1st January 2013, and previous results from the school have also been included.
An FDMS TEOM monitoring PM 2.5 was installed alongside the PM10 analyser in 2013 results from this have also been included in the table below.

Table 2.5 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

New site Kilmakee Activity Centre from 1st January 2013

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2013* [c]				
Kilmakee Activ Centre (PM_{10})	Urban Background	N	88.7%	88.7%	N/A	18				
Kilmakee Activ Centre ($PM_{2.5}$)	Urban Background	N	74.8%	74.8%	N/A	12				

Previous site at Dunmurry High School

Site ID	Site Type	Within AQMA ?	Annual Mean Concentration (µg/m^3)				
			2009* [c]	2010* [c]	2011* [c]	2012 [c]	2013 [c]
Dunmurry High School (PM_{10})	Urban Background	N	18	20	16	13**(c)**	n/a
Dunmurry High School ($PM_{2.5}$)	Urban Background	N	15	19	13	12	n/a

[c] Result has been annualised as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), as valid data capture is less than 75%

Table 2.6 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

New site Kilmakee Activity Centre from 1st January 2013

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2013				
Kilmakee Activ Centre PM_{10}	Urban Background	N	88.7%	88.7%	N/A	5				

Previous site at Dunmurry High School

Site ID	Site Type	Within AQMA?	Number of Daily Means > 50µg/m^3				
			2009	2010	2011	2012 c	2013
Dunmurry High School PM_{10}	Urban Background	N	1	0	11	3(32)	n/a

c data capture 50%for the calendar year , included the 90.4th percentile of 24-hour means in brackets

Figure 2.5 Trends in Annual Mean PM_{10} Concentrations

PM_{10} has remained consistently low in Dunmurry

2.2.3 Sulphur Dioxide

The SO_2 automatic site at Lagan Valley Island was decommissioned in December 2006 and moved to Dunmurry High School where monitoring continued from 2007 until relocation due to the schools closure in 2012.
The analyser was relocated at Kilmakee Activity Centre along side the PM_{10} monitoring. In 2013 full data was available from this site, the data has been fully ratified by AQDM.

Details of the QA/QC are available in Appendix A

Table 2.9 Results of Automatic Monitoring for SO_2: Comparison with Objectives

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Number of: [c]		
					15-minute Means > 266µg/m^3	1-hour Means > 350µg/m^3	24-hour Means > 125µg/m^3
Kilmakee Activity Centre Dunmurry	Urban Background	N	85.7%	85.7%	0	0	0

As there have been no exceedences of the objective since monitoring commenced in the Dunmurry area in 2007 the percentile have not been included, results have continued be very low.

2.2.4 Benzene

No monitoring of Benzene is carried out.

2.2.5 Other pollutants monitored

PAHs

Monitoring of PAH has been carried out at Dunmurry High School since 1999 and during the winter of 2007 /2008 additional sites were operated at Seymour Hill and Lisburn. Samples during this time were analysed daily instead of quarterly or monthly as required for the national PAH monitoring network.
The average concentrations of Benzo(a)pyrene (BaP) on days when all three samplers gave valid samples were 1.4ng/m3, 0.92ng/m3 and 0.99ng/m3. The UK National Air Quality Objective for PAHs is an annual average of 0.25ng BaP/m3. The EU target for PAHs is an annual average of 1ng BaP/m3. The annual average would be expected to be perhaps 50% of the values measured over a winter quarter. This suggests that none of the three sites is likely to breech the EU target however all are likely to be in exceedence of the UK national objective.

Further actions would need to be pursued to ensure reduction in emissions below the NAQO however this has not been undertaken to date to due to lack of funding.

$PM_{2.5}$
Automatic monitoring of $PM_{2.5}$ has been carried out in Dunmurry alongside the PM_{10} using TEOM FDMS , the results are included in table 2.7 and the reported ratified data included in appendix A.

Radiation Monitoring

Radiation monitoring has been carried out in Lisburn City Council for a number of years periodically throughout the year.
The measurements for 2013 are listed below:-

Date	$\mu Gy\ hr^{-1}$
July 2013	0.07
October 2013	0.08
April 2014	0.08

2.2.6 Summary of Compliance with AQS Objectives

Lisburn City Council has examined the results from monitoring in the City Council area. Concentrations are all below the objectives at relevant exposure; therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

Lisburn City Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Lisburn City Council 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 Planning Applications

Planning Application for 48 houses

A proposal has been received for 48 houses adjacent to the M1 motorway at Sprucefield, Lisburn at the on slip where the A1 joins the motorway. There is potential for this to include an off slip from the motorway. An Air Quality Impact assessment has been requested as NO_x tubes in the vacicity have shown an annual mean close to 40 ug/m^3

Anerobic Digestion Combined heat and Power Plant

It is proposed to develop an anerobic digestion CHP facility at an industrial site in Lisburn. The main potential for air quality impacts include the following:
Emissions to the atmosphere of typical combustion gases such as nitrogen dioxide, sulphur dioxide and carbon monoxide from the CHP unit combustion stack associated with the proposed development.
Emissions to the atmosphere may include particulates from the CHP unit combustion stack

Emissions from the CHP stack may result in localised increases in levels of air quality pollutants although the potential ground level concentration (GLC) of NO2, SO2 and CO at receptors has been predicted using the AERMOD atmospheric dispersion model and the predicted ground level concentrations show levels significantly below the limit values.

5 Local Transport Plans and Strategies

The Belfast Metropolitan Transport Plan 2015, of which Lisburn is part, proposed a number of transportation initiatives, which it stated will further enhance Lisburn's accessibility and support its role as a strategic location within the region, many of these should have a knock on effect on air quality i.e:

- The improvement of the rail services by up to 50% between Lisburn and Belfast, served by trains to/from Belfast and by the Belfast-Dublin Enterprise service;
- The provision of park and ride facilities at Kennedy Way on the M1 and the development of park and ride opportunities at Sprucefield;
- Development of a Quality Bus Corridor between Lisburn and Belfast City Centres;
- The introduction of Intelligent Transport Systems (ITS) solutions including Variable Message Signs (VMS) in conjunction with parking provision; and
- The widening of the M1 and junction improvements on Westlink.

Further significant improvements to the M1 between Blacks Road and Sprucefield, and the connection between the M1 and A1 are proposed. It is expected that the implementation of these measures will be outside the Plan period. However, development pressures in the Sprucefield area or at the Maze area may require these schemes to be implemented earlier, with developers responsible for their funding either in full or in a very substantial part.
In order to encourage greater use of public transport and more walking and cycling, thereby reducing car dependency, a range of measures are proposed which include:

- The development of an integrated network of Quality Walking Routes and cycle routes including the provision of improved links to bus and rail stations;
- Improvements to local bus services and inter urban bus services with improved frequencies on core routes supported by the introduction of bus priority measures at key junctions and in the city centre one way system;
- And a contra-flow bus lane that enables buses to access the bus station without having to pass round the full one-way system.

6 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

No monitoring sites at relevant exposure within the Council Area have showed exceedences of the air quality objectives.

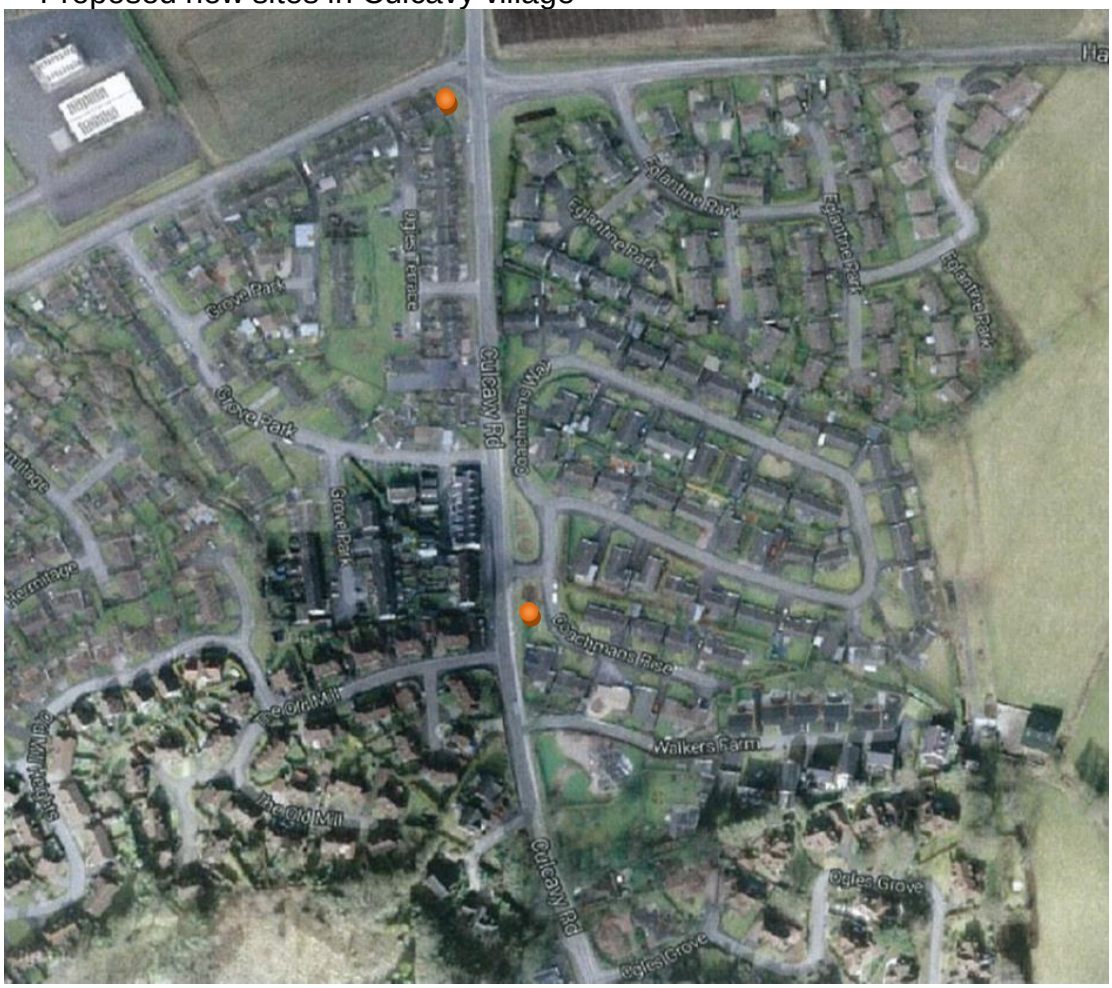
6.2 Conclusions relating to New Local Developments

N/A

6.3 Proposed Actions

Lisburn City Council has decided to continue monitoring of SO_2, PM_{10},$PM_{2.5}$ Black carbon and PAH at Kilmakee Activity Centre in 2014. An application has been made to the DOE for continued funding.
Lisburn City Council intends in 2014 locating two new diffusion tubes sites in Culcavy village due to concerns from residents about increasing traffic, particularly heavy goods vehicles, using the main through route.

Proposed new sites in Culcavy village



A new site has also been identified in Hillsborough village at relevant exposure. A narrow street leading through the village has now the tendency to become congested. Monitoring using an NO_2 diffusion tube will commence in 2014.

Proposed new diffusion tube site Hillsborough

7 References

LCC 2000	Air Quality reported submitted to the Department of the Environment Northern Ireland by Lisburn City Council.
LCC 2003/2004	Second/Third stage review and assessment of local air quality submitted to the Department of the Environment by Lisburn City Council
LCC 2005	Progress report submitted by Lisburn City Council to the Department of the Environment on local air quality
USA 2006	Air Quality Updating and Screening Assessment submitted to the Department of the Environment by Lisburn City Council and prepared by AEA Technology May 2006
EG 2007	Eastern Group Air Quality Progress Report. Annual report on air quality in the Eastern Group of local authorities including Lisburn City Council
EG 2008	Eastern Group Air Quality Progress report. Annual report on air quality in the Eastern Group of local authorities including Lisburn City Council.
USA 2009	Air Quality Updating and Screening Assessment submitted to the Department of the environment by Lisburn City Council and prepared by AEA Technology May 2009
LCC 2010	Progress report submitted by Lisburn City Council to the Department of the Environment on local air quality
LCC 2011	Progress report submitted by Lisburn City Council to the Department of the Environment on local air quality
USA 2012	Air Quality Updating and Screening Assessment submitted to the Department of the environment by Lisburn City Council

Appendices

Appendix A: QA/QC Data

Appendix A: QA/QC Data of automatic sites

In 2013 Lisburn City Council commissioned AQDM to provide the QA/QC of the automatic measurements of NO_2, SO_2 ,PM_{10} and $PM_{2.5}$ at the Lagan Valley Hospital and Dunmurry automatic sites. Local authority staff act as the local site operator and visit the sites on a weekly basis carrying out any manual calibration or filter changes required. Audits of the site are carried by NPL on a six monthly basis. Supportingu were employed to service and maintain the analysers.
Below are the results from the ratified data.

Produced by AQDM on behalf of Lisburn

LISBURN LAGAN VALLEY HOSPITAL 2013

These data have been fully ratified by AQDM to LAQM TG(09) standards

Site Description

Air Quality Statistics

Pollutant	NO_2	NO	NO_X
Number Very High [#]	0	-	-
Number High [#]	0	-	-
Number Moderate [#]	1	-	-
Number Low [#]	4111	-	-
Maximum 15-minute mean	80 µg m^{-3}	101 µg m^{-3}	218 µg m^{-3}
Maximum hourly mean	290 µg m^{-3}	998 µg m^{-3}	1815 µg m^{-3}
Maximum running 8-hour mean	141 µg m^{-3}	366 µg m^{-3}	684 µg m^{-3}
Maximum running 24-hour mean	94 µg m^{-3}	206 µg m^{-3}	408 µg m^{-3}
Maximum daily mean	91 µg m^{-3}	194 µg m^{-3}	387 µg m^{-3}
99.8th percentile of hourly means[†]	143 µg m^{-3}	-	-
Average	27 µg m^{-3}	18 µg m^{-3}	55 µg m^{-3}
Data capture	46.9 %	46.9 %	46.9 %

[#] Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
[†] Percentile required for data capture < 90%
Mass units for the gases are at 20'C and 1013mb
NO_X mass units are NO_X as NO_2 µg m^{-3}

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	27 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	290 µg m^{-3}	1	1	18 hours	No

Method of estimated annual mean concentration for LAGAN VALLEY HOSPITAL site
Using the methodology in **Box 3.2 of LAQM.TG(09)**

Site ID	Location	Within AQMA ?	Data Capture for monitoring period [a] %	Data Capture period 2013	Period concentrations (μg/m^3) 2013
Lagan Valley Hospital	Hillsborough Road	N	46.9	1st Jan 2013 – 24th June 2013	27

Long Term site with 97% data capture for 2013	Distance from Lagan Valley Hospital site	Annual Mean 2013	Period mean 2013	Ratio AM/PM
Derry Brooke Park (a)	**81 miles**	**14**	**13.8**	**1.014**
Belfast Central	**10 miles**	**31**	**32.2**	**0.96**
Ratio average				**0.987**

(a) Only other background site available so there will be an uncertainty with the results as this site is not within the recommended 50 miles

ie: Lagan Valley Hospital annual estimated data for 2013 is **26.64ug/m^3**

(The period mean 27 ug/m^3 x 0.987 = 26.64ug/m^3)

Produced by AQDM on behalf of Lisburn

LISBURN DUNMURRY Kilmakee Activity Centre 2013

These data have been fully ratified by AQDM to LAQM TG(09) standards

Site Description

Air Quality Statistics

Pollutant	PM_{10} [+]	$PM_{2.5}$~	SO_2
Number Very High [#]	0	0	0
Number High [#]	0	2	0
Number Moderate [#]	5	7	0
Number Low [#]	315	264	29901
Maximum 15-minute mean	-	167 µg m^{-3}	67 µg m^{-3}
Maximum hourly mean	158 µg m^{-3}	167 µg m^{-3}	67 µg m^{-3}
Maximum running 8-hour mean	91 µg m^{-3}	86 µg m^{-3}	31 µg m^{-3}
Maximum running 24-hour mean	74 µg m^{-3}	68 µg m^{-3}	17 µg m^{-3}
Maximum daily mean	69 µg m^{-3}	63 µg m^{-3}	17 µg m^{-3}
99.9th percentile of 15-minute means[†]	-	-	35 µg m^{-3}
99.7th percentile of hourly means[†]	-	-	21 µg m^{-3}
90.4th percentile of daily means[†]	30 µg m^{-3}	-	-
99.2nd percentile of daily means[†]	-	-	13 µg m^{-3}
Average	18 µg m^{-3}	12 µg m^{-3}	2 µg m^{-3}
Data capture	88.7 %	74.8 %	85.7 %

[#] Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
[†] Percentile required for data capture < 90%
[+] PM_{10} as measured by a FDMS using a gravimetric factor of 1
~ $PM_{2.5}$ as measured by a FDMS
Mass units for the gases are at 20'C and 1013mb

Air Quality Exceedences

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	69 µg m^{-3}	5	5	35 days	No
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	18 µg m^{-3}	0	-	-	No
$PM_{2.5}$ Particulate Matter *	Annual mean > 25 µg m^{-3}	12 µg m^{-3}	0	-	-	No
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	67 µg m^{-3}	0	0	35 15 mins	No
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	67 µg m^{-3}	0	0	24 hours	No
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	17 µg m^{-3}	0	0	3 days	No
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	2 µg m^{-3}	0	-	-	No

* Not set in regulations

QA/QC of Diffusion Tube Monitoring
The NO_2 tubes are supplied by ESG (Environmental Scientific Group) in Didcot Oxfordshire. Their preparation method is listed below.

Nitrogen Dioxide Diffusion Tube Analysis Report

The samples have been analysed in accordance with ESG's standard operating procedure HS/WI/1015 issue 15. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance.'

The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. In the WASP intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, Scientifics is currently ranked as a Category Good laboratory.This result can be found on the LAQM Support Web site
http://laqm.defra.gov.uk/diffusion-tubes/precision.html

Diffusion Tube Bias Adjustment Factors

Lisburn City Council decommissioned their NO_2 automatic site in 2013 and therefore no local bias adjust figure is available, therefore the national figure was applied.

The national bias adjustment factor for Environmental Scientific Group.is **0.80**

This figure can be found on the LAQM support web site
http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html