LARNE
Borough Council

2013 Air Quality Progress Report for Larne Borough Council

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

April 2013

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Executive Summary

This Progress Report allowed Larne Borough Council to review and assess air quality of monitored pollutants within the borough 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 consider a detailed assessment for that pollutant.

The Progress Report of air quality in Larne Borough has concluded that for Nitrogen Dioxide, the air quality objectives are likely to be met and that a more detailed assessment is not required.

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1 Introduction

1.1 Description of Local Authority Area

Larne Borough is situated on the east coast of Northern Ireland and is often described as 'The Gateway to Ulster' due to the operations of cross channel ferries to and from the port of Larne.

The Borough covers an area of approximately 131km^2, stretching over 36 miles along the Antrim coastline from Islandmagee and Ballycarry in the south to Glenarm and Carnlough in the north. Two of the Glens of Antrim and part of the Antrim Plateau make Larne Borough very scenic with two thirds designated as areas of outstanding natural beauty.

The population of the council area is just over 30,000 0f which Larne town alone makes up approximately $^2/_3$ of the total population. Larne is a busy seaport and market town situated 20 miles north of Belfast. It is within easy reach of Northern Ireland's two main airports being 21 miles from Belfast International Airport and 24 miles from Belfast City Airport. The area is supported both by major roads and a continuous rail link to Belfast – Dublin route.
The manufacturing, tourism and agriculture industries provide the main economic base of the Borough

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management process as set out in the Environment (Northern Ireland) Order 2002, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air

Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in 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 LAQM in Northern Ireland

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	Running 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

LAQM Activity	Completion Date	Brief Outcomes
1st Stage Review And Assessment	July 2001	A second stage assessment is required for nitrogen dioxide due to significant road traffic and industrial sources. Second stage assessment is necessary for sulphur dioxide due to significant industrial, domestic and shipping sources. Second stage assessment for PM_{10} is necessary due to significant road traffic, domestic, industrial and shipping sources.
2nd and 3rd Stage Review and Assessment	2004	Air Quality Objectives for NO_2, SO_2 and PM_{10} unlikely to be exceeded. No AQMAs declared.
Progress Report	April 2005	SO_2, NO_2 and PM_{10} objectives met. No AQMA to declare.
Update and Screening Assessment	April 2006	No detailed assessment required for any of the 7 pollutants. Monitoring of SO_2, NO_2 and PM_{10} to continue.
Detailed Assessment	April 2007	Not applicable- no AQMAs
Progress Report	April 2007	SO_2, NO_2 and PM_{10} objectives met. No AQMA to declare.
Progress Report	April 2008	SO_2, NO_2 and PM_{10} objectives met. No AQMA to declare.
Update and Screening Assessment	August 2009	No detailed assessment required for any of the 7 pollutants. Monitoring of SO_2, NO_2 and PM_{10} to continue. SO_2, NO_2 and PM_{10} objectives met.
Progress Report Addendum to Update and Screening Assessment Report 2009	April 2010	SO_2, NO_2 and PM_{10} objectives met. No AQMA to declare. Air quality objectives for SO_2 and PM_{10} met over the past 4 years and therefore continued monitoring no longer required. Air quality monitoring station decommissioned.
Progress Report	April 2011	NO_2 met. No AQMA declared.
Update and Screening Assessment	August 2012	No detailed assessment required for any of the 7 pollutants. Air quality objectives met. Monitoring of NO_2 to continue.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

No Automatic monitoring carried out

2.1.2 Non-Automatic Monitoring Sites

Monthly average concentrations of NO_2 are monitored using passive diffusion tubes located at 8 sites identified as having potentially the highest concentration of NO_2 at the first round of review and assessment.

Environmental Scientifics Group (ESG) have had the contract for supplying and analysing the Nitrogen Dioxide Diffusion Tubes since April 2008 and prior to that Lambeth Scientific Services were used.

ESG are UKAS accredited and demonstrate satisfactory performance in the Workplace Analysis Scheme for Proficiency (WASP) over the past five quarterly rounds as verified on the Defra Local Air Quality Management Web pages.

The tubes are analysed by an aqueous extraction followed by automated flow injection analysis/UV spectroscopy.

A Bias Adjustment factor of 0.79 has been applied which was taken from the latest spreadsheet of factors i.e. version 03/13, year 2013- Environmental Scientifics Group - Didcot (50% TEA in Acetone) from the Review and Assessment Website.

Data from site reference L4 was annualised.

Please refer to Appendix A for diffusion tube locations

Appendix B for full data set (monthly mean values) from January 2005-December 2012

Appendix C for annualised data

Appendix D for quality assurance information

Table 2.1 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
DT1	Site Name 1	Urban background	332395	433175	2.5	NO_2	Y	N	Y (1m)	3.5	Y
L1	Antiville Road/A8 Junction	Roadside	3864	0212	3m	NO_2	N	N	N	n/a	Y
L2	Riverdale/ Lathama House	Urban Background	3968	249	3m	NO_2	N	N	N	n/a	
L3	Main Street Larne	Urban Centre	4016	0260	3m	NO_2	N	N	N	Approx 1m	Y
L4	Victoria Rd/Agnew St Junction	Kerbside	4033	0285	3m	NO_2	N	N	N	Approx 3m	Y
L5	Upper Cairncastle Rd	Kerbside	3920	0323	3m	NO_2	N	N	N	Approx 3m	

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
L6	Larne Harbour Roundabout	Roadside	4123	0196	3m	NO_2	N	N	N	n/a	Y
L7	Coastguard Rd/Castle Terrace	Other	4131	0171	3m	NO_2	N	N	N	n/a	
L8	Ballylumford Rd, Islandmage	Other	4206	0203	3m	NO_2	N	N	N	n/a	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Diffusion Tube Monitoring Data

Monitoring for 2012 is detailed in the table below

Table 2.2 Results of NO_2 Diffusion Tubes 2012

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) [a]	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.79 [b]
DT1	A1 Location	Roadside	N	Triplicate and Co-located	11	34.6
DT2	A2 Location	Roadside	N	N	12	**43.4**
DT3	A3 Location	Roadside	Y	N	12	**62.3**
L1	Antiville Road/A8 Junction	Roadside	N	N	11	23.15
L2	Riverdale/ Latharna House	Urban Background	N	N	12	14.8
L3	Main Street, Larne	Urban Centre	N	N	12	23.36
L4	Victoria Rd/Old Glenarm Rd	Kerbside	N	N	2[a]	35
L5	Upper Cairncastle Rd	Kerbside	N	N	12	20.59
L6	Larne Harbour Roundabout	Roadside	N	N	12	16.81
L7	Coastguard Rd/Ca Terrace	Other	N	N	12	9.98

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2012 (Number of Months or %) [a]	2012 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.79 [b]
L8	Ballylumford Rd, Islandmage	Other	N	N	11	10.97

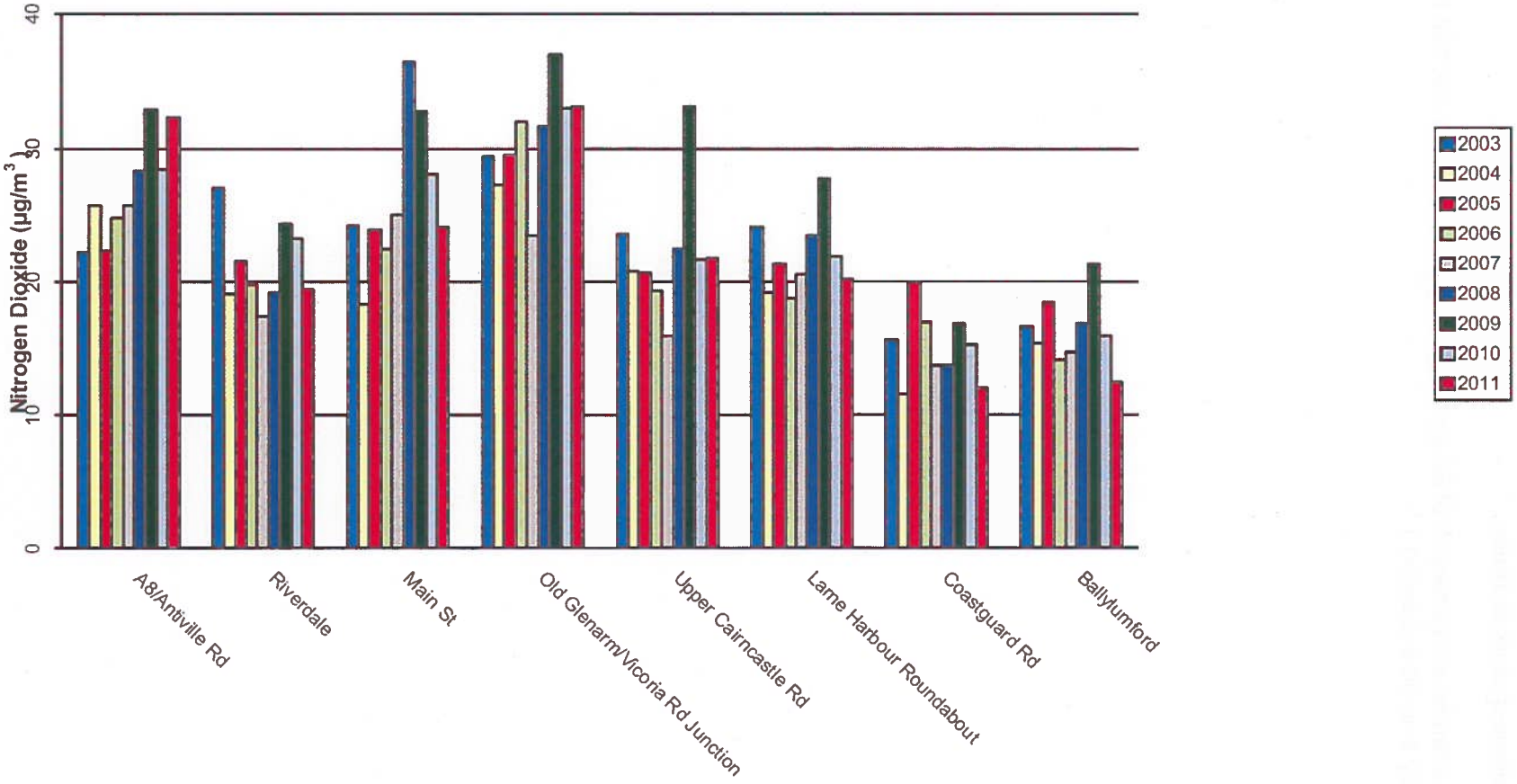
[a] Data was "annualised" as in Box 3.2 of TG(09)(http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38),

[b] It should be noted that the monitoring sites are not representative of public exposure. However as there were no exceedences it was not necessary to use the procedure specified in Box 2.3 of TG(09) to estimate the concentration at the nearest receptor.

Table 2.3 Results of NO_2 Diffusion Tubes (2008 to 2012)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2008 (Bias Adjustment Factor = 0.93)	2009 (Bias Adjustment Factor = 0.99)	2010 (Bias Adjustment Factor = 0.83)	2011 (Bias Adjustment Factor = 0.83)	2012 (Bias Adjustment Factor = 0.79)
DT1	Roadside	N	**64.1**	32.6	34.7	**40.2**	36.9
L1	Antiville Road/A8 Junction	N	28.27	32.9	28.32	32.3	23.15
L2	Riverdale/ Latharna House	N	19.2	24.39	23.23	19.36	14.8
L3	Main Street, Larne	N	36.48	32.8	28	24.14	23.36
L4	Victoria Rd/Old Glenarm Rd	N	31.62	36.96	32.94	33.12	35
L5	Upper Cairncastle Rd	N	22.39	33.09	21.66	21.78	20.59
L6	Larne Harbour Roundabout	N	23.44	29.7	21.92	20.21	16.81
L7	Coastguard Rd/Cas Terrace	N	13.75	16.9	15.26	12.05	9.92
L8	Ballylumford Rd, Islandmage	N	16.86	21.29	15.99	12.46	10.97

Figure 1 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



Although over the last 10 years there have been no exceedences of the annual mean NO_2 objective of 40 $\mu g/m^3$, in the years 2007-2009 there was a year on year increase on NO_2 levels. However, in 2010 levels begun to fall at all sites and in 2011 this trend continued at 5 out of the 8 sites. In 2012 the same 5 sites have continued to see a decrease in levels with another 2 also seeing a decrease since 2011.

One site presented slight increase.

There have been no exceedences of 60 $\mu g/m^3$. (This would indicate a risk that the 1-hour objective may also be exceeded.)

2.2.2 Summary of Compliance with AQS Objectives

Larne Borough Council has examined the results from monitoring in the borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Development

Larne Borough 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.

Larne Borough 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 Conclusions and Proposed Actions

4.1 Conclusions from New Monitoring Data

The assessment has indicated that there are no exceedences for Nitrogen Dioxide identified within the borough and the Air Quality objectives are being met.

4.2 Conclusions relating to New Local Developments

No new local developments were identified

4.3 Proposed Actions

The progress report has identified that no Detailed Assessment is required for Nitrogen Dioxide however monitoring will continue into 2013.
A further progress report will be submitted in 2013.

5 References

The Environment (Northern Ireland) Order 2002

Air Quality Regulations (Northern Ireland) 2003

Larne Borough Council First Stage Review and Assessment of Air Quality 2001

Air Quality Review and Assessment Stage 2 AEA/ENV/R/1010

Local Air Quality Management Technical Guidance LAQM.TG (09)

Appendices

Appendix A – Diffusion Tube Locations

Appendix B: NO_2 Diffusion Tube Monitoring Results

Month and Year	Average Monthly NO_2 Concentration ($\mu g/m^3$) Location							
	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
January 2005	18	15	17	22	17	20	15	-
February 2005	22	20	20	29	18	14	13	14
March 2005	20	15	24	16	12	6	8	10
April 2005	14	19	19	19	19	19	12	16
May 2005	18	26	28	24	18	24	21	20
June 2005	35	39	29	33	25	27	21	20
July 2005	18	14	17	23	14	11	13	20
August 2005	13	11	-	22	8	-	13	16
September 2005	21	14	14	31	12	19	8	13
October 2005	16	14	16	24	23	14	46	13
November 2005	4	12	17	20	18	16	11	9
December 2005	24	17	36	29	24	24	16	17
January 2006	29	27	28	62	22	16	12	18
February 2006	22	15	15	20	21	25	12	14
March 2006	11	12	8	15	9	12	6	5
April 2006	16	16	10	19	11	12	9	6
May 2006	22	14	21	25	15	16	16	13
June 2006	21	-	28	19	13	14	8	-
July 2006	19	-	20	25	19	16	13	9
August 2006	16	14	19	20	14	19	12	14

Month and Year	Average Monthly NO_2 Concentration ($\mu g/m^3$) Location							
	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
September 2006	22	14	23	28	24	19	9	13
October 2006	19	15	16	19	6	7	11	13
November 2006	17	15	26	28	6	15	35	17
December 2006	29	22	19	25	25	16	9	10
January 2007	21	13	23	24	15	20	8	20
February 2007	37	23	29	24	18	21	11	15
March 2007								
April 2007	21	16	16	9	15	13	20	11
May 2007	-	11	19	13	14	13	10	9
June 2007	61	15	7	-	6	17	13	8
July 2007	14	14	-	25	9	18	11	11
August 2007	17	14	29	26	8	19	12	8
September 2007	24	14	-	26	14	20	13	13
October 2007	28	19	33	-	11	25	15	10
November 2007	26	19	-	30	21	22	14	23
December 2007	38	26	34	-	34	27	16	25

Month and Year	Average Monthly NO_2 Concentration ($\mu g/m^3$)							
	Location							
	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
January 2008	34	44	31	40	25	42	21	20
February 2008	31	21	31	37	32	23	18	19
March 2008	30	16	29	33	20	21	10	22
April 2008	26	20	32	32	23	28	14	14
May 2008	32	24	37	37	35	31	27	13
June 2008	25	17	27	32	17	17	14	19
July 2008	24	15	25	11	19	23	13	14
August 2008	27	19	30	33	21	20	9	12
September 2008	33	26	28	43	23	26	15	19
October 2008	33	14	24	38	19	22	10	17
November 2008	25	17	-	31	21	24	14	26
December 2008	42	29	38	41	33	30	14	25
January 2009	53	29	36	43	43	36	22	29
February 2009	45	27	43	55	32	31	18	26
March 2009	36	14	31	37	27	24	`12	25
April 2009	36	26	40	40	37	-	18	18
May 2009	34	20	-	38	23	31	13	14
June 2009	-	29	30	-	-	30	28	17
July 2009	2	-	26	-	22	28	12	15
August 2009	-	19	26	-	24	28	11	15
September 2009	46	29	40	6	64	-	20	29
October 2009	24	32	28	79	27	35	14	21
November 2009	37	24	30	40	30	24	13	22
December 2009	44	35	44	46	35	38	24	27

	Average Monthly NO_2 Concentration ($\mu g/m^3$)							
	Location							
Month and Year	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
January 2010	42	55	42	46	33	31	21	27
February 2010	37.71	41.32	46.75	47.06	39.82	44.64	30.77	22.32
March 2010	46.99	29.76	46.68	50.13	33.52	30.08	19.11	29.76
April 2010	34.08	30.87	32.33	43.98	23.59	27.67	23.88	19.19
May 2010	30.40	21.15	28.75	26.70	24.85	22.59	16.64	15.81
June 2010	21.88	13.44	23.80	29.94	16.89	13.82	13.44	9.60
July 2010	32.34	18.58	28.72	37.64	22.68	-	11.58	16.17
August 2010	25.34	11.89	22.84	30.66	14.70	10.64	11.57	16.89
September 2010	30.5	21.7	26.4	40.5	25.4	27.1	13.1	20.1
October 2010	35.4	26.3	29.1	41.8	26.1	25.6	15.1	17.3
November 2010	33	28.6	30.5	36.8	22.4	28.4	19.6	14.5
December 2010	39.8	37.2	46.9	45.1	30.2	29	24.8	22.5
January 2011	42.9	31.8	-	41.1	33.5	29.8	18	19.5
February 2011	51.5	43.9	-	50.2	29.1	46.6	20	22.9
March 2011	42.7	27.5	39.2	43.2	32.6	27.8	17.2	14.1
April 2011	39.3	26.4	37.2	40.1	30.8	30.9	15.7	14.6
May 2011	23	15.4	20.7	31.2	19.8	16.6	7.5	-
June 2011	28.7	17.6	28.8	34.8	22.4	20.6	11.9	14.2
July 2011	19	14.4	23.1	-	19.6	16.4	11.2	9.3
August 2011	-	16	28.2	35	21.5	17.1	11.5	-

Month and Year	Average Monthly NO_2 Concentration ($\mu g/m^3$)							
	Location							
	Antiville Rd/A8 (Grid Ref 3864 0212)	Riverdale (Grid Ref 3968 0249)	Main Street (Grid Ref 4016 0260)	Victoria Rd/Agnew Street (Grid Ref 4033 0285)	Upper Cairncastle Road (Grid Ref 3920 0323)	Larne Harbour Roundabout (Grid Ref 4123 0196)	Coastguard Road (Grid Ref 4131 0171)	Ballylumford Road (Grid Ref 4206 0203)
September 2011	-	15.7	20.9	38.4	22.9	22.4	7.9	10.4
October 2011	-	23.6	27.7	44.8	25.5	-	10.9	13.4
November 2011	-	24.9	32.9	48.8	38.7	15.3	27.9	21.6
December 2011	28.4	-	32.1	31.4	18.5	-	-	19.1
January 2012	29.7	24	39.3	46.9	18.1	29.8	3	22.5
February 2012	38.5	22.3	31	41.8	26.8	24.5	13.4	19.2
March 2012	34.7	23.6	35.2	-	34.6	24.7	15.4	15.2
April 2012	22.8	14.2	24.7	-	19.8	19.3	13.7	13.4
May 2012	27.4	16	25.6	-	17.9	18.7	17.9	9.7
June 2012	25.2	18.3	28.8	-	22.8	18.1	12.8	8.5
July 2012	-	12.2	24	-	19	13.8	11.2	9.6
August 2012	26.7	18.3	23.2	-	30.2	20.4	12.4	-
September 2012	23.6	13.1	16	-	23.4	16.1	10.1	11.6
October 2012	27.9	19.7	36.6	-	26.9	22	12.5	12.7
November 2012	23.8	17.1	27	-	32.4	19.8	8.7	11.3
December 2012	42.1	26.1	43.5	-	40.8	28.2	20.5	19

NB Lambeth Scientific Services collected and analysed the data from January 2008 to March 2008. A new contract started with Bureau Veritas (Now ESG) in April 2008.

Appendix c: Short-term to Long-term Data adjustment

Adjustment Factor for Victoria Road/Old Glenarm Road Data

Site	Annual Mean	Period Mean	Ratio
Belfast	29.2	29.1	1
Londonderry	15	14.5	1.03
		Average	1

Appendix D - QA/QC of Diffusion tube Monitoring

Table 1: Laboratory summary performance for WASP NO_2 PT rounds 113 - 120

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent HSL WASP NO_2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of ≤ ± 2 as defined above.

WASP Round	WASP R113	WASP R114	WASP R115	WASP R116	WASP R117	WASP R118	WASP R119	WASP R120
Round conducted in the period	April - June 2011	July - September 2011	October - December 2011	January – March 2012	April – June 2012	July – September 2012	October – December 2012	January – March 2013
Aberdeen Scientific Services	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Bristol City Council [4]	100 %	100 %	100 %	-	-	-	-	-
Cardiff Scientific Services	100 %	100 %	75 %	100 %	100 %	100 %	100 %	100 %
Edinburgh Scientific Services	100 %	100 %	0 %	100 %	100 %	100 %	100 %	100 %
Environmental Services Group, Didcot (formerly Bureau Veritas Laboratories, Glasgow and Harwell Scientifics) [1] [2]	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Exova (formerly Clyde Analytical)	100 %	0 %	75 %	0 %	0 %	100 %	25 %	75 %
Glasgow Scientific Services	100 %	100 %	100 %	100 %	50 %	100 %	100 %	50 %
Gradko International [2]	100 %	100 %	37.5 %	100 %	100 %	100 %	100 %	100 %
Kent Scientific Services	100 %	100 %	75 %	75 %	100 %	75 %	100 %	50 %
Kirklees MBC	0 %	0 %	50 %	100 %	100 %	75 %	100 %	100 %
Lambeth Scientific Services	25 %	100 %	25 %	75 %	100 %	0 %	100 %	100 %
Milton Keynes Council	75 %	100 %	100 %	100 %	100 %	75 %	100 %	50 %
Northampton Borough Council	100 %	100 %	100 %	100 %	100 %	100 %	100 %	0 %
Somerset Scientific Services [3]	-	-	100 %	100 %	100 %	100 %	100 %	100 %
South Yorkshire Air Quality Samplers	100 %	100 %	100 %	100 %	100 %	100 %	100 %	100 %
Staffordshire County Council	100 %	100 %	100 %	100 %	100 %	75 %	100 %	50 %
Tayside Scientific Services (formerly Dundee CC)	100 %	100 %	100 %	100 %	100 %	100 %	100 %	75 %
West Yorkshire Analytical Services	75 %	100 %	100 %	75 %	75 %	50 %	100 %	100 %

[1] Bureau Veritas laboratory and Harwell Scientific now part of ESG Group.
[2] Participant subscribes to two sets of test samples (2 x 4 test samples) in each WASP PT round.
[3] New participant from R115.
[4] No longer involved in NO_2 diffusion tube measurements from R116.

Summary of Precision Results for Nitrogen Dioxide Diffusion Tube Collocation Studies, by Laboratory

ESG Didcot, 50% TEA in Acetone	
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	G
2012	P
2012	P
2012	P

National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 03/13

ESG Didcot	50% TEA in acetone	2012		**Overall Factor[3] (26 studies)**	**Use**	**0.79**